Finalizing the deal with the customer...

The budget and schedule look good.

Yes, definitely. Wait, we forgot to put HCI in the schedule.

HCI? What's that?

I have no idea. It's on this checklist. They make it look good, I think.

Hang on... lemme see.

Well, I've got 73 cents. Will that be enough?

Great! We'll just add an hour or two at the end of the schedule... there. HCI!

Carl Angiolillo
2011-10-31
Agenda

Evaluation overview
Last week
Usability evaluation methods
Heuristic evaluation
Cognitive walkthrough, KLM-GOMS
Next
Evaluation overview

Competitive analysis – October 24 ✓
Expert review  – October 31
Web analytics – November 7
Think aloud – November 14
Clients: Reports – November 21
Last week

Competitive analysis questions?
<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>NAVIGATION</td>
<td>Does a user know where he is now, where to go next, and how to get there from here?</td>
<td></td>
</tr>
<tr>
<td>HOMEPAGE</td>
<td>Does the homepage provide a comprehensive overview of what is available on the site and encourage exploration?</td>
<td></td>
</tr>
<tr>
<td>PRODUCTS</td>
<td>Can a user find &quot;his&quot; product easily? Are product pages scannable, highlighting features and benefits for a quick overview? Is there more detailed product information available for expert users?</td>
<td></td>
</tr>
<tr>
<td>SUPPORT</td>
<td>Does the site provide appropriate support for its users? Can a user find the support resource(s) he needs?</td>
<td></td>
</tr>
<tr>
<td>SEARCH</td>
<td>Are search results comprehensive? Is there [useful] advanced search functionality available?</td>
<td></td>
</tr>
<tr>
<td>EVIDENCE</td>
<td>Are testimonials, usage statistics, or clinical evidence content available and easy to locate?</td>
<td></td>
</tr>
<tr>
<td>EDUCATION</td>
<td>Are there educational resource available? Can a user quickly figure out what's available and how to register or get more information?</td>
<td></td>
</tr>
<tr>
<td>MULTIMEDIA</td>
<td>Does the site incorporate images, video, audio, or interactive elements? Are they presented in-context or easy to locate?</td>
<td></td>
</tr>
<tr>
<td>SOCIAL MEDIA</td>
<td>Does the site incorporate social media options such as bookmarking &amp; sharing or RSS feeds? Are they easy to locate?</td>
<td></td>
</tr>
<tr>
<td>TECHNOLOGY</td>
<td>Does the site present an overview of the technology used?</td>
<td></td>
</tr>
</tbody>
</table>
Accessibility

~7% of US males are red-green color blind: http://www.hhmi.org/senses/b130.html

As designers we should strive to make our products accessible.

What *is* usability?

A usable product:
- Supports routine performance
- Supports non-routine performance
- Reduces or prevents human error
- Prevents or recovers from system error
- Pleasant to use

usable $\neq$ useful
We want to improve usability!

If you cannot measure it, you cannot improve it.
Usability Evaluation Methods

Empirical methods $$$
– Observation
– Experimentation

Analytical methods $
– Derived from physical, psychological, sociological, or design theories
– Heuristics derived from experience
Empirical (testing) methods

- Contextual inquiry (September 19)
- Web analytics (November 7)
- Think aloud (November 14)
- Remote testing
- Log analysis
- Eye tracking
- “Wizard of Oz” studies
- Surveys and questionnaires
- Diary studies
Analytical (inspection) methods

• **Heuristic evaluation** (UIM¹ Ch2)
• The GOMS (Goals, Operators, Methods, and Selection rules) family
  – *Keystroke-Level Model* (KLM)
• **Cognitive walkthrough** (UIM¹ Ch5)
• Pluralistic walkthrough (UIM¹ Ch3)

¹UIM = Usability Inspection Methods, Nielsen & Mack
Analytical (inspection) methods

“Discount usability engineering methods” – Jakob Nielsen

Usually a small team of evaluators using analytical methods to review an interface based on recognized usability principles
Heuristic evaluation

0. Brief the group
1. Evaluate individually
2. Aggregate issues
3. Apply severity ratings
4. Summarize findings
Step 0: Brief the group

Heuristic evaluation methodology (this)

Domain briefing
- Important if evaluators are unfamiliar with the product’s domain

Scenario briefing
- Can optionally include specific tasks or scenarios or allow evaluators to explore on their own
Step 1: Evaluate individually

Two passes

1. Inspect flow (and optional tasks/scenarios)
2. Inspect each element against heuristics

Recognized usability principles
– 10 Nielsen heuristics (UIM Ch2, p.30)
H1: Visibility of system status
Keep users informed
H2: Match between system and real world

Speak the users’ language

Follow real-world conventions
H3: User control and freedom

Undo, exits for mistaken choices
Don’t force fixed paths

1. Don’t use your browser’s BACK button. If you click on it, you will return to this page.

http://www.dshs.wa.gov/ppa/PoMdocuse.shtml
H4: Consistency and standards

Same words, situations, and actions mean the same -- follow platform conventions
H5: Error prevention

Careful design to prevent problems from occurring in the first place
H6: Recognition rather than recall

Make objects, action, and options visible
H7: Flexibility and efficiency of use

Accelerators for experts
Tailor frequent actions or objects
H8: Aesthetic and minimalist design

Extraneous information in an interface competes with relevant information
H9: Error recovery

Help users recognize, diagnose, and recover from errors

Solution-oriented
H10: Help and documentation

Easy to search and find
Always available and task-oriented
Nielsen’s Heuristics

H1: Visibility of system status
H2: Match between system and real world
H3: User control and freedom
H4: Consistency and standards
H5: Error prevention
H6: Recognition rather than recall
H7: Flexibility and efficiency of use
H8: Aesthetic and minimalist design
H9: Error recovery
H10: Help and documentation
Step 1: Evaluate individually

ID, name, heuristic

- **ID:** <evaluator’s initials>-HE-##
- **Name:** succinct description
- **Heuristic:** H1-10

<table>
<thead>
<tr>
<th>ID</th>
<th>Name</th>
<th>Heuristic(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>cda-HE-09</td>
<td>No feedback during image upload process</td>
<td>H1 Visibility</td>
</tr>
<tr>
<td>cda-HE-10</td>
<td>File size instructions use jargon</td>
<td>H2 Match</td>
</tr>
<tr>
<td>cda-HE-11</td>
<td>Upload error message provides no guidance</td>
<td>H9 Recovery</td>
</tr>
<tr>
<td>cda-HE-12</td>
<td>File navigator starts from root folder every time</td>
<td>H7 Flexibility</td>
</tr>
<tr>
<td>cda-HE-13</td>
<td>Image upload requires users specify file type</td>
<td>H6 Recognition</td>
</tr>
</tbody>
</table>
Step 1: Evaluate individually
Step 1: Evaluate individually
Step 1: Evaluate individually

**Source and Destination** *(directories need a trailing "/")*

- `/media/D4AA1D6CAA1D4C7C/Users/placeholder/Desktop`
- `/home/placeholder/Desktop/backup/`

**Basic options**
- Preserve time
- Verbose
- Ignore existing
- Skip newer

**Advanced options**
- Preserve permissions
- Preserve group
- Do not leave filesystem
- Show transfer progress

**Extra options**
- Size only
- Windows compatibility

**Notes:**

- [ ]

[Image of a GUI window showing a file synchronization tool with options for source and destination paths, basic and advanced options.]
Step 1: Evaluate individually

Sessions
- default

Source and Destination (directories)
- /media/D4AA1D6CAA1D4C7C/Users/
- /home/\*\*\*\*\*\*\*/Desktop/backup/

Basic options
- Preserve time
- Preserve owner
- Delete on destination
- Verbose
- Ignore existing
- Skip newer

Advanced options
- Do not leave filesystem
- Show transfer progress
- Size only
- Windows compatibility

Notes:

Progress:
- Global progress: 7%
- 15% (0:06 elapsed, 0:35 remaining)
# Step 2: Aggregate issues

Read issues in turn, consolidate a list

<table>
<thead>
<tr>
<th>ID</th>
<th>Combined name</th>
<th>Heuristic(s)</th>
<th>Evaluator(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HE-12</td>
<td>No feedback during image upload process</td>
<td>H1 Visibility</td>
<td>cda-HE-09, ljd-HE-02, ht-HE-04</td>
</tr>
<tr>
<td>HE-13</td>
<td>OK and Apply button perform same action</td>
<td>H4 Consistency</td>
<td>ljd-HE-03, sh-HE-11</td>
</tr>
<tr>
<td>HE-14</td>
<td>New entries appear above viewable area, user must manually scroll to see them</td>
<td>H1 Visibility</td>
<td>ljd-HE-06, sh-HE-02, ht-HE-04</td>
</tr>
<tr>
<td>HE-15</td>
<td>Email addresses must be added manually from memory</td>
<td>H5 Error prevention, H6 Recognition</td>
<td>ljd-HE-07, cda-HE-04, ht-HE-01</td>
</tr>
</tbody>
</table>
Step 2: Aggregate issues

Activity
How many evaluators?
How many evaluators?

Proportion of Problems Found

Evaluators

UIM p.33
How many evaluators?

![Graph showing the ratio of benefits to costs with a peak at 4-5 evaluators.](chart.png)

- 0 evaluators: No benefit over cost.
- 1 evaluator: Benefits start to increase.
- 2 evaluators: Benefit increases rapidly.
- 3 evaluators: Benefit begins to plateau.
- 4 evaluators: Benefit reaches peak.
- 5 evaluators: Peak benefit, 4-5 range is optimal.

UIM p.35
### Step 3: Apply severity ratings

<table>
<thead>
<tr>
<th>Rating</th>
<th>Severity Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Catastrophic</td>
</tr>
<tr>
<td></td>
<td>- Product cannot be released</td>
</tr>
<tr>
<td>3</td>
<td>Major</td>
</tr>
<tr>
<td></td>
<td>- High-priority issue</td>
</tr>
<tr>
<td>2</td>
<td>Minor</td>
</tr>
<tr>
<td></td>
<td>- Good to fix when there’s a lull</td>
</tr>
<tr>
<td>1</td>
<td>Cosmetic</td>
</tr>
<tr>
<td></td>
<td>- Icing on the cake (these rarely get done)</td>
</tr>
<tr>
<td>0</td>
<td>Not a problem</td>
</tr>
<tr>
<td></td>
<td>- I don’t agree that this is a problem at all</td>
</tr>
</tbody>
</table>
Step 3: Apply severity ratings

Justification:

- **Frequency**: Common or rare occurrence?
- **Impact**: How bad is it? How hard to recover?
- **Persistence**: One-time problem users can work around or unavoidable problem?

For each issue, average the rating from each evaluator
Step 3: Apply severity ratings

Activity
Step 4: Summarize findings: Usability Aspect Reports

Short (1 page max) report for each issue

Goes by many names
  – Usability Problem Report (UIM Ch11)
  – Usability Aspect Report (CMU)
  – Bug/Issue Report (Bugzilla, JIRA, Rational)

Audience: primarily developers
  – Specific and convincing
  – Compiled in final report’s appendix or entered directly into bug tracking system
Step 4: Summarize findings: Usability Aspect Reports

**ID:** “HE-##”

**Name:** succinct description

**Evidence:** just the facts, ma’am

**Explanation:** which heuristic violated, your interpretation of the evidence

**Severity:** rating and justification

**Solution:** (optional) include possible fixes

**Relationships:** (optional) link to related reports
Step 4: Summarize findings:
Usability Aspect Reports
Step 4: Summarize findings: Executive summary

What are the important take-aways for people who do not read the individual Usability Aspect Reports?

Look for the forest in the trees
– Consider affinity diagramming

Audience: Project managers, team leads
Heuristic evaluation

0. Brief the group
1. Evaluate individually
2. Aggregate issues
3. Apply severity ratings
4. Summarize findings
Heuristic evaluation advantages

“Discount usability engineering”
Low intimidation
Don’t need to identify tasks, activities
Can identify obvious fixes
Can expose problems user testing doesn’t

Provides a shared language for talking about usability recommendations
Heuristic evaluation disadvantages

- Un-validated
- Inconsistent
- False alarms -- problems unconnected with tasks
- May be hard to apply to new technology
Cognitive Walkthrough

Especially suited to “first-time” use

Cognitive theory, exploratory learning

Evaluator(s) walk through each state of a task while answering questions about a hypothetical user’s goals, perceptions, and comprehension (See UIM Ch5)
Keystroke-Level Model (KLM-GOMS)

GOMS methods apply to skilled users only. Quantitative prediction of performance Model Human Processor, ACT-R, Fitts’ Law

KLM is an easy-to-use GOMS and CogTool is a free software tool for doing KLM (see http://cogtool.hcii.cs.cmu.edu/)
Agenda

Evaluation overview
Last week
Usability evaluation methods
Heuristic evaluation
Cognitive walkthrough, KLM-GOMS
Next
Next

Readings
- Usability Inspection Methods Ch2 & Ch11

Discussion Section
- Practice heuristic evaluation (bring laptops)

Homework
- Conduct a heuristic evaluation

Next week’s lecture
- Web analytics on November 7