Is your web site usable?  
How do you know?

Usability Presentation to Local.com 
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As you may know . . .

• . . . in 2005 we published the second edition of Bias and Mayhew, *Cost-Justifying Usability: Update for the Internet Age*. 
Well . . .

• . . . I’d like to offer you one SURE FIRE way to decrease development costs.
• Eliminate all software QA testing.

Thank you very much for your time and attention.
OK, so you found that unsatisfying?

- You can’t imagine Web or other SW development without testing for SW defects.

- Nor is it wise to ship or “go live” without usability evaluation.
Objectives

1 - Offer a little background regarding usability engineering
2 - Communicate the VALUE of pursuing usability in the development of your web site
3 - Demonstrate that usability isn’t just a “nice-to-have”

- Thank you for having me here today.
Professional History

• B.S. in psych from FSU
• Ph.D. in cognitive psych from UT-Austin
• Bell Labs for 3 years
• IBM-Austin for 11 years
• BMC Software for 5 years
• Co-founded small usability consultancy
• Previously adjunct faculty member at UT; Have taught at UT, Rutgers, Huston-Tillotson, (SW)TSU
• Assoc. prof. in the UT School of Information since 2003.
• Recently started The Usability Team.
Two Jokes

. . . designed to simultaneously

1. Establish the domain for our talk

and

2. Insult everyone in the room.
Definitions

Usability -- the quality of a system, program, website, or device that enables it to be easily understood and conveniently used.

Usability affords the user easy access to the product’s functions.

HCI -- the point of contact between the user and the computer, including all physical and informational content.
Poor usability is rampant

- “66.8% of online shoppers have abandoned sites because they were unable to locate a product; 59% have left because the sites were disorganized or confusing.” (1)
- In a study of online merchandise purchases, “almost half of all attempts to make a purchase failed because the users could not work out how to complete the transaction.” (2)
- It’s estimated that billions in potential revenue are lost yearly due to user confusion and frustration on the web. (3)

Why does this happen?

• Typical software development process:
  – product conception (MRD)
  – design: product mgmt and engineering negotiate features
  – coding; maybe a visual designer makes a pass
  – QA / test
  – deployment
  – customers & users start complaining, support phones ring
  – big customers submit modification requests team gets to work addressing issues for R1.1

• Why wasn’t the user represented earlier in the process?
Why no usability engineering?

- Website built to satisfy management, not users
  - “Branding” becomes the focus, site is treated as an advertisement, visual design overrides usability
  - It takes an act of corporate bravery to put up a relatively austere, simple site
- Engineering owns too much responsibility for UI design
  - Thus, the UI reflects implementation technologies, developers’ design model
- Teams can’t escape featuritis:
  - “Competitor A has these 5 features, competitor B has those 10… we’d better put them all in our next release.”
The Discipline

- Human Factors
- Ergonomics
- Man (sic) - Machine Interface
- Human-Computer Interaction
- Human Performance Engineering
- Cognitive Engineering
- Software Psychology
- Usability Engineering
Role of Psych in SW Design

- Anthropometry → Seats, Keyboards
- Sensory → Screen etching
- Perception → Synthetic speech
- Cognition → Desktop metaphor
- Memory → Menu interfaces
- Psycholinguistics → Readable text
- Decision Making → Control programs
- Individual Differences → Display tilt, aliasing
What is Usability?

- Usability is NOT
  - Just common sense
  - all art (and no science)
  - stumbled onto by accident
  - tacked on at the end
  - free

- Usability IS
  - intuitive, safe, error-free, enjoyable
  - best designed in from the beginning
  - best achieved by knowing your users
  - “The best predictor of customer satisfaction”
  - “The next competitive frontier”
Engineering, not art

• Usability professionals aren’t “keepers of the magic key.”

• We purvey usability engineering methods -- specific, learnable techniques that yield valuable data.

• Bad idea: “Mr. or Ms. Software Developer, don’t depend on your own intuitions. Depend on MINE!!”
Design

• Design entails discovery.
• Design should be empirical.
• Design is a process.
2 Design Approaches

• Analytical
  – Armchair design

• Empirical -- Dreyfus (1953)
  “Designing for people”
  – “Design is an intimate collaboration between engineers, designers, clients.”
  – User focus throughout.
  – Studied cabins for ocean liners.
  – 8 “staterooms” in a warehouse.
  – “Travelers” packed and unpacked for trips of 1 week to 3 months.
  – Prototyping, iteration, collaborative design.
Be Empirical!

From Carroll and Rosson:

“Our view is that design activity is essentially empirical . . . not because we ‘don’t know enough yet,’ but because we can never know enough.”
Black Magic

• NZ stomped the US in the 1995 America’s Cup.

• Headed by Peter Blake and designer Doug Peterson.

• SI, 5/22/95: “One of Blake’s earliest and best decisions was to build 2 nearly identical boats. It enabled NZ to test rigging configurations, keels, sails, and rudders and learn exactly how much faster or slower each change made the boats go.”
• Blake: “We learned nothing about boat speed from the trials . . . and everything from the two-boat program.”

• “Blake told Peterson he wanted the sailors to be involved in the design process from the start.”

• Peterson: “Everyone participated in decisions from the start. As opposed to the usual way of having a design team over here, and the sailing team over there, and directors telling you what you have to do.”
Participatory, User-Centered Design

• You don’t have programmers write the docs, do all the testing, perform the marketing.
• It’s no longer expected (usually) that programmers design the user interface.
• For UI design to succeed you need three sets of skills:
  – Programming
  – HCI expertise
  – Domain expertise
• It is VERY unusual for all three sets of skills to reside in the same person.
And so . . .

**Empirical Design:**
Carroll and Rosson quote: 
“. . . not because we ‘don’t know enough yet,’ but because we can never know enough.”

**Participatory Design:**
Like the Kiwis.

**User-centered Design:**
Like Dreyfus.
Principles of User-Centered Design

The ABCs of developing useful and usable user interfaces are:

A. Products driven by task analysis
B. Designs based on perceptual/cognitive theory
C. Frequent and intentional UI evaluation and user feedback
A. Task Analysis

• Have a crisp understanding of what tasks our users are trying to perform.
• Have a crisp understanding of what our users’ environments are like.
• Have a crisp understanding of what our users are like.

There are many, varied techniques we can use to gain this understanding. (Some good, some not so good.)
B. Perceptual/Cognitive Theory

• The $H$ in HCI

• What would the UI look like if you were designing a computer system for dogs?
  – Probably wouldn’t be much text
  – Might code information in smells or tastes
  – Wouldn’t want to require much dexterity in the user responses

• Since we design for humans, we’ll benefit from knowing something about how humans receive and process info.
Perception and Cognition (cont’d.)

• What do we know about humans?
  – In the physical realm: Anthropometry.
  – These days we’re more interested in the cognitive realm.
  – Question: Can you remember a 30-digit number?
  – I say that you can, right now, without practice, seeing it only once, for 1 second, with no time to rehearse.
3333333333333333333333333333333
So?

- So, the answer to “Can you remember a 30-digit number?”, is . . . It depends. On what?
  - Whether you hear or see the number.
  - Whether the number is masked.
  - Whether you have time to rehearse.
  - Whether you can “chunk” the numbers.
  - If there are any intervening tasks.
  - How meaningful the number is.
  - WHAT the number is.

So, what’s a usable interface?
It depends.
C. UI Evaluation

- “Six months and $200,000.”
- Recent move toward “discount usability engineering”
  - “Heuristic evaluation”
  - Usability walkthroughs
  - UI Guidelines
  - Some lab testing
  - Field tests
  - Prototypes mailed out
  - Remote usability testing
  - Extant user data that are being lost
Yeah, right, Randolph.

- Cost-justification of usability methods
  - Bang-for-the-buck
  - Quantifying costs is easy
  - Quantifying benefits is harder, but possible
Importance of a CBA (cost-benefit analysis) Approach

• Development resources are finite.
• Software developers should NOT depend on their own intuitions.
• Software development managers like (need!) quantitative data.
• Usability needs to (and CAN!) compete for resources on a level playing field.
Versus?

• The old way . . .
• Product development manager at the head of the table, receiving estimates from . . .
  – Software developers
  – Writers
  – Testers
  – Usability professionals
Scenario: NextGreatThing 1.0

- Expect to sell 1000 licenses of NGT 1.0 in Year 1. At $3000/license, projected revenues = $3,000,000. Yahoo!

- Proposed usability engineering program:
  - Usability Walkthrough = $6,000
  - End-User testing = $20,000
  - Beta Survey = $5,000
- Total Cost = $31,000

- "Omigawd! We can’t spend 31K!"
But what of the BENEFITS?

First – development efficiencies.

- Walkthrough reveals 4 large usability problems.
  • Cost to fix (given the early stage of development) = 2 Developer Hours.
  • Had problems been discovered after coding, cost to fix and test = 8 Developer weeks.
  • Realized development savings = $24,000.
Scenario: NextGreatThing 1.0

More BENEFITS?

Reduced call support burden.

- All usability testing reveals
  - 4 tasks that require a call to the help desk 100% of the time, and
  - 6 more that fetch calls 50% of the time.
- That’s a projected 7000 help desk calls prevented in the first year alone.
- 1 call to the help desk = $150
- X 7000 calls = $1,050,000 savings.
Scenario: NextGreatThing 1.0

More BENEFITS?

Increased sales.

- Improved customer satisfaction is projected to yield 10 additional licenses a month.
- Cost of a license - $3000
- X 120 extra licenses/year = $360,000 increase in revenue.
More BENEFITS?

• Increased customer satisfaction brings excellent product reviews in the press

• *(Priceless!)*
Scenario: NextGreatThing 1.0

Summary of benefits:

- Dev. efficiencies: $ 24,000
- Reduced call support: $1,050,000
- Increased revenue: $ 360,000
- Total benefit $1,434,000

Cost had been, what? $ 31,000

Yielding an **ROI of 46 : 1**

(in the first year alone) !!!
We’re talkin’ real dollars!

- Creative Good had 50 consumers visit the sites of 8 leading e-tailers. 43% of all attempts to carry out a transaction failed, because the users could not complete the purchase process.
- According to the GVU 10th WWW user survey, 67% of online shoppers have abandoned sites because they were unable to locate a product; 59% have left because the sites were disorganized or confusing.
- Two anecdotes
  - CD Now
  - Groceryworks.com
Don’t forget the intangibles.

Avoid P.R. disasters

Ask Katherine Harris

Drive Customer Loyalty

Apple Macintosh

Don’t forget the intangibles.
The Dangers of Amateur Usability Engineering

- There IS a certification for usability engineers, but . . .
- This is NOT just “common sense.” If it were, why CD Now (etc.)?
- There ARE some important skills needed to perform objective, empirical testing.
- A poor software developer will be revealed fairly early, at least during system test; a poor usability engineer won’t be revealed until the customer support line gets inundated, or your software becomes shelfware, or your web site conversion rate is way low.
- You WANT your design team to be PASSIONATE about their design – so don’t depend on them for an objective test of its goodness.
Top 10 indicators that YOU need usability engineering.

10. You hear your lead developer complain that your users are “too stupid.”

9. Your customer support team is three times as big as your development team.

8. Think about it – would you ever call your own baby “ugly”?

7. The vendor who’s developing your training materials just bought a new Porsche.

6. Your sales force says that despite all your wondrous functionality your competitor’s product “just demos better.”
Top 10 indicators that YOU need usability engineering.

5. You hear your developers say “Hey, our users SHOULD know how hard this was to develop.”

4. Two words: Florida ballot.

3. You assume your product is usable. You know what happens when you ASS-U-ME!

2. Your customers aren’t willing to spend 45 minutes on your e-commerce site just to save 9 cents.

And the Number 1 indicator that you need usability engineering is…..
1. You are developing a web site or software user interface for ANYONE other than yourself!
Questions?
Logistics

- Emergency exits
- Class timing, breaks
- Informality – ask questions
- Index cards:
  - Name
  - Program (e.g., School of Info, Masters)
  - Year (1\textsuperscript{st}, 2\textsuperscript{nd}?)
  - Any historical experience with usability (classes or work history)
  - What do you hope to get out of this class?
Once around the room.
Review Syllabus
Context of Usability

Usability

- Market Research
- Localization
- Internationalization
- Accessibility
- CRM/Cust. Support
- Tech Pubs
- Training
- QA Testing
- HCI Design
Context of Usability

- Market Research – What do people want? What will they pay for?
- Localization
- Internationalization
- Accessibility
- HCI Design
- QA Testing
- Tech Pubs
- Training
- CRM/Cust. Support

Usability
Context of Usability

Usability

- HCI Design – What looks cool?
  What design will work?  IA.
- QA Testing
- Tech Pubs
- Training
- CRM/Cust. Support
- Accessibility
- Internationalization
- Localization
- Market Research

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Context of Usability

- Usability
- Market Research
- Localization
- Internationalization
- Accessibility
- HCI Design
- QA Testing – Does the code work as spec’d?
- Tech Pubs
- Training
- CRM/Cust. Support
- QA Testing – Does the code work as spec’d?
- Tech Pubs
- Training
- CRM/Cust. Support
Context of Usability

- Market Research
- Localization
- Internationalization
- Accessibility
- CRM/Cust. Support
- HCI Design
- QA Testing
- Tech Pubs – What help will the user need?
- Training

Usability
Context of Usability

Usability

- Market Research
- Localization
- Internationalization
- Accessibility
- HCI Design
- QA Testing
- Tech Pubs
- CRM/Cust. Support
- Training – What does the user need to know in advance?
Context of Usability

Usability

- HCI Design
- QA Testing
- Tech Pubs
- Training
- CRM/Cust. Support – How can we best serve/keep our users?
- Accessibility
- Internationalization
- Localization
- Market Research
Context of Usability

Usability

Market Research

Localization

Internationalization

HCI Design

QA Testing

Tech Pubs

Training

CRM/Cust. Support

Accessibility – How can we make our info & functions available to all?
Context of Usability

Usability

- Internationalization – How can we maximize its foreign use?
- Localization
- Accessibility
- CRM/Cust. Support
- Tech Pubs
- Training
- QA Testing
- HCI Design
- Market Research
Context of Usability

Localization – How can we make it used in a particular culture?
Internationalization

Usability

Market Research

HCI Design

QA Testing

Tech Pubs

Training

Accessibility

CRM/Cust. Support
## Context of Usability

**Usability**

<table>
<thead>
<tr>
<th>Market Research</th>
<th>Discoverability – can folks FIND the function?;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Localization</td>
<td>Learnability – can folks learn how to use the function?;</td>
</tr>
<tr>
<td>Internationalization</td>
<td>Usability – can folks carry out their intended task?</td>
</tr>
<tr>
<td>Accessibility</td>
<td></td>
</tr>
</tbody>
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<td></td>
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</tbody>
</table>

**Context of Usability**

- Discoverability
- Learnability
- Usability
Check out . . .

I AM A BOMB TECHNICIAN
IF YOU SEE ME RUNNING
TRY TO KEEP UP
Homework

• Read Norman book.
• Bring to class an example or a verbal description of
  – One really bad design, AND
  – One really good design.
(NOT a web site, for this time.)

See you next week.