

Finding a Tighter Fit Between Tools & Practice for Web Design

James A. Landay

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@ UW, CSE 501

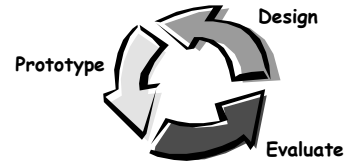


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Best Practices for Designing Interfaces

- Iterative design



- Getting it right the first time is hard
- Prototyping tools can be the key to success

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Outline

- **Study of Web Designers**
- Denim Prototype & Evaluation
- Denim Visual Language
- Informal vs. Formal UI Study

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Investigation into Web Design

- Interviews with 11 professional web site designers
 - focus on specific projects and artifacts
 - “take me through a recent project”
 - artifacts were collected and analyzed
- Designers were
 - from 5 different companies
 - representative of different specialties
 - information architects
 - creative directors/project managers
 - graphic designers
 - all-of-the-above (esp. smaller firms)

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What We Learned

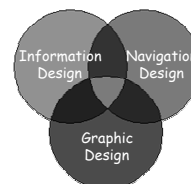
- Design specialties
 - different dimensions of “web design”
 - how they are related
- Design process
 - key stages shared across firms
- Products of the process

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Design Specialties



- Information design
 - structure, categories of information
- Navigation design
 - interaction with information structure
- Graphic design
 - visual presentation of information and navigation (color, typography, etc.)

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Design Specialties

- Information Architecture
 - also includes management and more focus on content
- User Interface Design
 - also includes testing and evaluation

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Web Site Design Process

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Design Process: Discovery

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Design Process: Design Exploration

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Design Process: Design Refinement

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Design Process: Production

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Products Information Architecture First

- Post-Its & large surfaces (ie, affinity diagrams)
 - haptic UI
 - brainstorming
 - collaborative
 - solo
 - persistent, immersive representation
 - hard to share, edit, make digital



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Products Multiple Views

- Designers create representations of sites at *multiple levels of detail*
- Web sites are iteratively refined at all levels of detail

Site Maps Storyboards Schematics Mock-ups

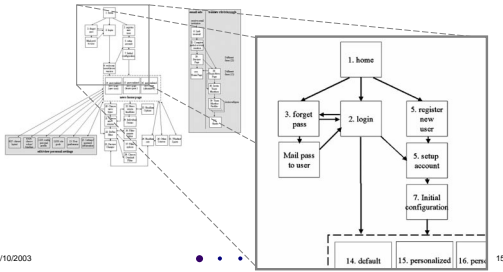


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Products Site Maps

- High-level, coarse-grained view of entire site

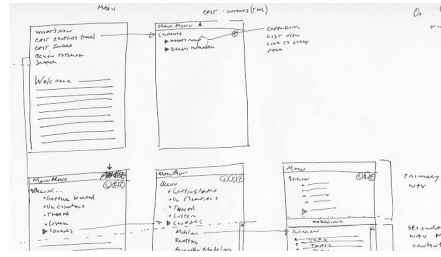


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Products Storyboards

- Interaction sequence, minimal page level detail



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Products Individual Pages

Sales Home

(Site Branding)

Home, Inc. Kids Outdoors Catalogue Travel Features About This Site (linked new bar)

What this site is about... Learn more about our brand, competitive advantage, and our core technology and services. Search with "x" or "OR"

News Topic:

- This month's news release (994)
- This month's news release (994)

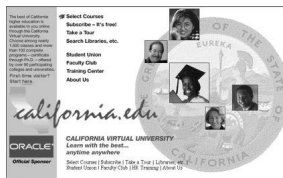
News Topic:

- This month's news release (944)

News Topic:

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Home, Inc. sales home
section 1 - section 2 - section 3 - section 4 - section 5
section 6 - section 7 - section 8 - section 9



Schematic

Mock-up

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Products Sketches

All designers sketched



... at all levels

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Products Sketches

- Reasons for sketching
 - “work through” ideas & explore design space
 - design exploration not supported by current tools
 - face-to-face collaborative situations
- Sketching less than they wanted to
 - “professionalism”: need to present ideas formally
 - ease of incremental modification
 - “The beginning of each step I'll do on paper. As soon as I feel like I'm going to be doing any design revisions, I'll move to [an electronic tool]... because it's easier to make changes to these things.”

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Products Sketches

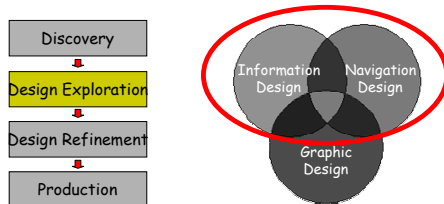
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 - face-to-face collaborative situations
- Sketching less than they wanted to
 - “professionalism”: need to present ideas formally
 - ease of incremental modification
 - other advantages of electronic reps
 - replication, distribution, etc

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Room for Improvement

- Design exploration phase
- Information & navigation design



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Implications for a Exploration Phase Web Design Tool

- Support multiple views
 - retain advantages of informal representations
 - gain advantages of electronic media
- Support transformations to more formal representations
 - currently not supported in our work

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DENIM: Designing Web Sites by Sketching



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DENIM: Designing Web Sites by Sketching

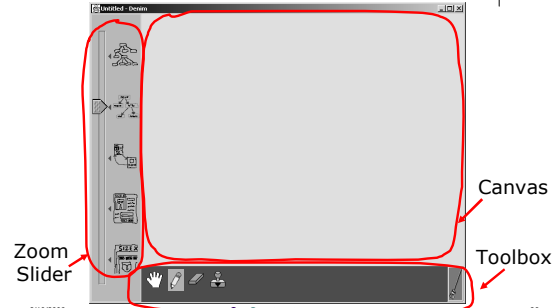
- Early-phase information & navigation design
- Integrates multiple views
 - Site map – storyboard – page sketch
- Supports informal interaction
 - Sketching, pen-based interaction
- Implementation
 - Java 2, SATIN



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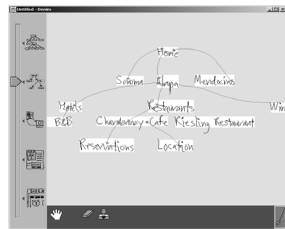
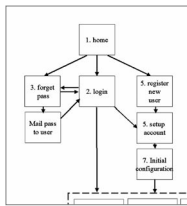
DENIM



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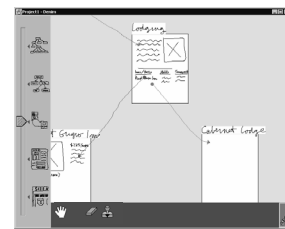
DENIM: Site Map View



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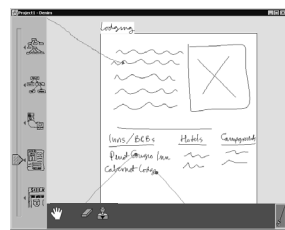
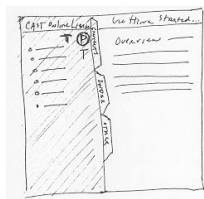
DENIM: Storyboard View



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DENIM: Sketch View



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Video

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Informal Evaluation

- Evaluation focused on
 - usefulness of basic functionality
 - usability of basic interaction
- 7 participants
 - 5 work mostly on web projects
 - 1 designer of non-web UIs
 - 1 usability manager of a large software company

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Task

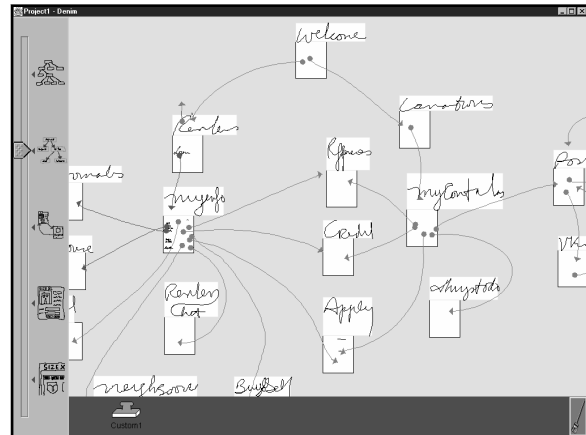
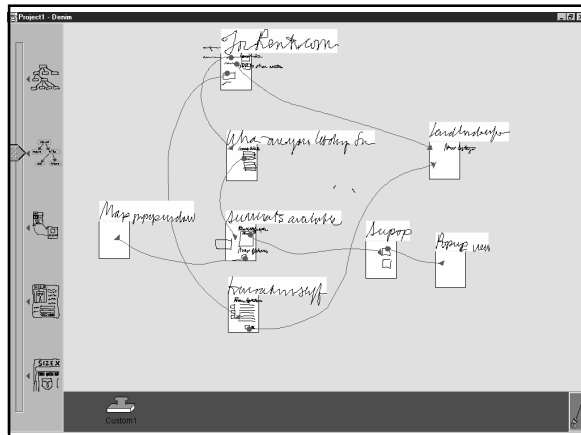
- Design task
 - 45-60 minutes to create "ForRent.com" web site
 - provided
 - competitive analysis
 - market research on what renters, landlords want
 - what client company wanted
 - wanted to see
 - how participants approached realistic design task
 - how they used DENIM to help design
 - extra motivation: \$250 for best design



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Summary of Results

- Web designers rated it highly in
 - usefulness
 - communication with team members
 - expressiveness
 - quick iteration
 - efficiency
- ...but found it lacking in terms of
 - handwriting
 - linking pages
 - communication with clients

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Positive Feedback

- Liked the different views integrated

"I usually [create site maps] in PowerPoint, then I go back to the navigational flow, then I go back to PowerPoint... And here it would be so easy to do that iterative kind of thing."

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Positive Feedback

- Liked informal interaction

"You draw a box in Illustrator or Freehand or Quark, and it's got attributes that have to be dealt with, and it interrupts the thought process.... It's nice to be able to get rid of all the business with the pictures and all the definite object attributes. That is such a hassle."

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Usability Issues

- Hard time linking pages
 - pages were too small to draw arrows, or
 - could only see one of the pages at enough detail
- solutions implemented
 - auto pan
 - hide pages in site map view
 - radar view



old



new

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Usability Issues

- Handwriting was difficult
 - writing surface was too smooth
 - application feedback was sometimes slow
 - automatic word grouping was poor
- solutions implemented
 - improved performance
 - improved inking & grouping algorithms

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Making DENIM Scale

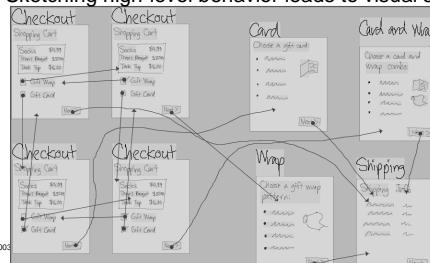
- Prototyping checkout process featuring
 - selected items
 - optional gift wrap
 - optional gift card

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DENIM Scalability Problems

- Must create check boxes from scratch for every use
- Sketching high-level behavior leads to visual spaghetti



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Solving the Scalability Problems

- Target audience: designers who are not likely to know programming
- Solution: add features within familiar sketching paradigm
 - **Components** for recurring elements (e.g., check box)
 - **Global transitions** for navigation bars
 - **Conditionals** to avoid explosion of pages
 - **Enhanced arrows** for new types of page transitions

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A Visual Language for Sketching Large and Complex Interactive Designs

James Lin
Michael Thomsen
James A. Landay



May 11, 2001

Outline

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Why would fidelity and medium affect user testing?

- Fidelity and medium change interaction
 - Example: text-entry is handwritten or typed
 - Colors in high-fidelity direct attention
- Fidelity and medium may alter the users' views on:
 - Functionality of prototype
 - Causes of and solutions for usability problems
 - Ability of users to have an impact on design (Hong et al, 2001)

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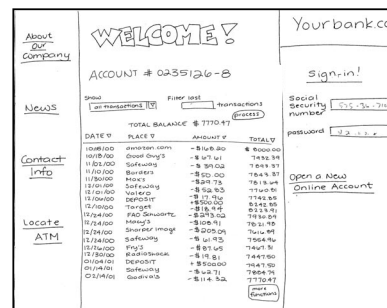
Making early stage prototypes

	Paper Medium	Computer Medium
Low-fidelity	Sketched with paper and pens	Scanned in paper pages
High-fidelity	Printed screens	Coded in HTML

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Low-Fidelity Prototype



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High-Fidelity Prototype

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Experimental design

- Participants were unaware of the experimental hypotheses
- Each participant saw *either* low-fidelity or high-fidelity websites on *both* paper and computer

	Paper then Computer	Computer then Paper
Low-fidelity	8 users	8 users
High-fidelity	6 users	6 users

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Testing Methods

- Faked prototype functionality by constraining tasks
 - Sign-up for online banking services
 - Email a checking account statement
 - Calculate value of foreign currency
 - ...
- Asked participants to think aloud
- Recorded their comments, and took copious notes
- Gave participants minimal assistance
- Followed up user tests with more questions

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Analysis method: effective usability testing

- More problems - six comments on one issue vs. one comment on each of six issues
- Most severe problems
- All types of problems e.g. consistency, feedback
- Level of detail - information architecture problems, widget problem

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Quantitative analysis process

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Issues

BILL PAYER

Scheduled Payments
Single Payments
Recurring Payments
Pending Payments
Payment History
Payee List

Issue: confusion between scheduled, single, & recurring on bill payer

Comments:

"I would like recurrent payments...no scheduled. I don't see the point, I don't see the difference between these two but um..."

"Payment. Oh, actually, it would be recurring. I'm trying to decide if it's a scheduled payment or recurring payment."

"Oops. Recurring. Then the single payment would be like a scheduled? How would... I'm just trying to figure out what the difference would be between the two."

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Quantitative Analysis of Results

- 1270 comments and 169 issues
- Low-fidelity vs High-fidelity
 - No significant differences in number of comments or issues
- Paper vs. computer
 - Average of 5 more comments about computer prototype (Wilcoxon signed ranks test, $p = 0.015$)
 - Issues – no significant difference

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Results

- No differences in severity of issues found
- No differences in scope of issues
- Differences between fidelities but not media categorizing issues by Nielsen's heuristics (Chi Squared, $p < 0.01$)
- Only 10% of comments mentioned aesthetics
- Classifying issues using Nielsen's Heuristics is difficult

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Conclusion

Fidelity and medium do not seem to affect quantity of problems found by user testing

Prototyping techniques should be chosen by considering:

- Need for remote testing
- Importance of recording design process
- Keeping designs at a level of detail appropriate to the stage of design

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DENIM Summary

- DENIM supports web design practice
 - integrated multiple views
 - Sketching
- DENIM *adds to* current practice
 - lo-fi interactive prototypes
 - advantages of electronic media



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