Introducción a Human-Computer Interaction

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Web Development

Contents
- Developing Customer-Centered Sites
  - Design Process
- The Stock Study
- Web Usability
- Web Design Patterns
Developing Customer-Centered Sites

The design process is iterative; that is, it repeats and jumps back and forth when necessary.

- Discovery: Understanding the target customers and their needs, and communicating the business and customer goals for the Web site.
- Exploration: Generating several rough initial Web site designs, of which one or more will be chosen for further development.
- Refinement: Refining the navigation, layout, and flow of the selected design.
- Production: Developing a fully interactive prototype and a design specification.
- Implementation: Developing the code, content, and images for the Web site.
- Launch: Deploying the Web site for actual use.

Design Process: Discovery

With user-centered design, you do the work up front to ensure that the site has the features that customers need.

Design Process: Design Exploration

Generating several rough initial Web site designs, of which one or more will be chosen for further development.

Generate multiple designs
- Visualize solutions to discovered issues
- Information & navigation design
- Early graphic design
- Select one design for development

Assess needs
- Understand clients' expectations
- Determine scope of project
- Characteristics of users
- Evaluate existing site and/or competition
Design Process: Design Refinement

Polishing the navigation, layout, and flow of the selected design.

- Discovery
- Design Exploration
- Design Refinement
- Production

Develop the design
- increasing level of detail
- heavy emphasis on graphic design
- iterate on design

Design Process: Production

Developing a fully interactive prototype and a design specification

- Discovery
- Design Exploration
- Design Refinement
- Production

Prepare design for handoff
- create final deliverable
- specifications, guidelines, and prototypes
- as much detail as possible

Artifacts of Design Practice

Designers create representations of sites at multiple levels of detail

- Site Maps
- Storyboards
- Schematics
- Mockups

"Websites are iteratively refined at all levels of detail"
Storyboards

**Interaction sequence, minimal page level detail**

[Diagram of storyboards showing interaction sequence]

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Developing Customer-Centered Sites

**Schematics are representations of the layout and content that will appear on individual pages**

[Diagram of schematics]

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Schematics

**Page structure with respect to information and navigation**

[Diagram of schematics showing page structure]
Developing Customer-Centered Sites

Medium-fidelity prototypes have many more details about content, but they do not distract clients or customers with fonts, colors, and graphics.

Developing Customer-Centered Sites

A high-fidelity prototype is detailed and rich with typography, colors, and graphics.

Mock-ups

High-fidelity, precise representation of page.
The Spool Study

Spool studied usability of web from point of view of users
finding information, especially info to make decisions.

- 9 popular sites (products & info)
  - Disney
  - ESPN.com
  - Microsoft
  - Yahoo!
  - Microsoft News
  - Microsoft's vision
  - Microsoft's strategy
  - Microsoft's technology resources
  - Microsoft's products & services

- Gathered data from observations of users
  - Tasha's information needs (4 types of tasks)
    - Text entry to retrieve information, generally simple facts
      - locating information
      - typical text search is 10:000 words
    - comparison of facts
      - locating two pieces of the nation plus a comparison
      - 100 listings per decade in the Jeep Cherokee or Toyota Tundra
      - Chrysler

- Users
  - users with Web browsers

Findings

- Many home pages offered little information on available content

- Users scroll if the top part of the page contains useful information. However, if it contains ads, etc, they assume more of the same below.

-Whitespace negatively correlated with usefulness.
  - Content counts
Comparison of Sites

- Finding information is difficult & very frustrating for users
  - enormous size and effort to answer simple questions
  - users often give up without finding information
- Sites that were expected to do well fared poorly and vice versa
  - Disney & CNN (graphically intense)
  - Edmonds - mostly text

Spool’s Web Site Usability Issues

- Classify each issue as
  - information, navigation, graphic or other design
- Total for each category

<table>
<thead>
<tr>
<th>Category</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Graphic Design</td>
<td>21%</td>
</tr>
<tr>
<td>Information Design</td>
<td>9%</td>
</tr>
<tr>
<td>Navigation Design</td>
<td>67%</td>
</tr>
<tr>
<td>Other Design</td>
<td>3%</td>
</tr>
</tbody>
</table>

Design Specialties

- Information Architecture
  - encompasses information & navigation design
- User Interface Design
  - also includes visual and evaluation
Navigation design

- How well the user can predict where the link will lead.
- How well the user can differentiate one link from other, nearby links.
- Number of links, location of links (within-page, image links)

Links

- Users had trouble with short links
  - "If you click on DisneyLand, will you get a map of the park? Rights information, etc?"
- Larger links clearly set expectations
  - "How to Read the Pricing and Rating Listings"
  - "Pricing (How to Read Pricing & Rating Listings)"
- Links embedded in paragraphs are worse
  - hard to find information
  - can't skim + must read
- Text links used before graphical links
  - Descriptive, longer link names => know where you will go
  - However, wrapped links caused confusion => separate links that word wrap

Usability Issues

- Graphic design
  - Too much white space, unrelated or distracting graphics.
  - Animations annoyed users who tended to scroll past them
  - Theoretically animations could be useful in conveying information, but they found no examples of this

- Information design
  - Little support for comparisons, poor readability
Major Implications

- Graphic design fairly neutral in terms of information retrieval (however, these sites generally had good quality graphic design).
  - Users may report disliking design, but does not correlate with retrieval success
  - Text links are vital to avoid downloading delays
  - Navigation and content are inseparable, so users can predict where links will take them
  - Information retrieval is different than surfing & requires different design approach

Web Site Design improves Sales

- NY Times on IBM web site, 8/30/99
  - "Most popular feature was search, because people couldn’t figure out how to navigate the site."
  - "The second most popular feature was the help button, because the search technology was so ineffective."

- After the redesign, use of the "help" button decreased 84 percent, while sales increased 400 percent

Usabilidad de WWW
Usabilidad de WWW

Los sitios web usables resultan de una combinación de arte e ingeniería

- El buen diseño gráfico provoca mayor dedicación a las páginas individuales, y puede facilitar la experiencia del visitante en el sitio.
- Las estructuras de información bien diseñadas facilitan a los visitantes la navegación del sitio.

Usabilidad de WWW

- ¿Cómo diseñar un sitio WWW?
- Determinar objetivo del sitio
  - Información, promoción, comercio
- Conocer las preferencias usuarias
  - Idiap, gíenem, teniendo la usabilidad, experiencia, etc.
- Aplicar alguna metodología de diseño iterativo
  - Prototipos en papel
  - Principales de diseño específicos para WWW
  - Evaluación con usuarios reales

Criterios de diseño de WWW

- Criterios locales
  - Layout
  - Navegación
  - Links
  - Gráficos
  - Calidad
  - Subjetividad
- Criterios globales
  - Navegación
  - Calidad
  - Subjetividad
Criterios de diseño de WWW

- Criterios locales: layout
  - Largo de página
    - Los usuarios no deben efectuar scroll
    - El largo de cada página no debe exceder el 30% del ancho de la pantalla
  - Barra de navegación
    - Su uso debe facilitar la interacción a los usuarios

- Criterios locales: la yout
  - Porcentaje de texto
    - Por defecto, el % de texto de una página no debe superar el 30% (estos: imágenes, fotos, etc.)
  - Parágrafos cortos
    - El usuario prefiere escanear la página, no leer

- Uso de html/CSS
  - La longitud de los párrafos debe ser menor a 80(120) píxeles
**Criterios de diseño de WWW**

- **Criterios locales: links**
  - Links con su sintaxis
  - Los links deben contener al menos un sustantivo (documentado)
  - Longitud de los links
  - Los links deben ser cortos para posibilitar la lectura rápida
    - Hasta 3/4 palabras
  - Link “click here”
  - No prepondera información acerca de la página destino

- **Criterios locales: gráficos**
  - Imágenes con texto alternativo
  - El usuario puede hacer click en la carga de imágenes (por mejora de performance)
  - Tamaño de las imágenes en un papel
    - Debe acortarse el tamaño total destinado a imágenes en una página
    - Mayor cantidad de imágenes produce mayor tiempo de descarga

- **Criterios locales: gráficos**
  - Utilizar recursos para reducir el tiempo de descarga de imágenes
    - Imágenes en blanco y negro
  - Indicador del tamaño de la imagen
    - La probabilidad del tamaño de la imagen permite al browser determinar exactamente su localización
    - El texto de la página aparece rápidamente en su posición (level)
    - El usuario puede leer el texto mientras se carga la página
Criterios de diseño de WWW

- Criterios locales: calidad
  - Link a la Home Page: Permite al visitante ingresar al contenido del sitio
  - Informar el origen y características del sitio
  - Dirección del sitio al cual pertenece la página
    - Dar título y descripción
    - Dirección del sitio
  - Dirección del Webmaster
    - Dirección de comentarios, sugerencias, etc.
  - Copyright
    - Indicar los derechos de propiedad de la página
  - Fecha de última actualización
    - Indicar la actualización y calidad de los datos contenidos

Criterios de diseño de WWW

- Tamaño de la página
  - Velocidad de conexión: proporciones un alto valor de la página
  - Conocer la tecnología disponible por los usuarios potenciales
  - Determinar el tamaño de las páginas de acuerdo a dicha tecnología

Criterios de diseño de WWW

- Criterios locales: subjetividad
  - Home Page representación del contenido del sitio
    - El visitante debe recibir una idea rápida del objetivo y contenido del sitio
  - Claro en los conceptos centrales en la página
    - Facilitar la comprensión del visitante
  - Distribución de elementos visuales y textuales
    - Balance entre los elementos visuales y textuales en la página
  - Combinación adecuada de características
    - No producir buen valor al visitante
    - No aburrir a los visitantes
  - Tamaños y formas de los caracteres
    - Utilizar características legibles de acuerdo
    - Establecer los tamaños y formas de acuerdo
  - Animaciones
    - Evitar la presencia de arrastramientos que distraigan al visitante
### Criterios de diseño de WWW

**Criterios globales: navegación**
- Links destacados
  - Evitar la presencia de links "cañeros"
- Páginas de inicio
  - Evitar la existencia de páginas debidas (o semi-debidas)
- Consistencia en los links principales
  - Asegurar la misma localización y presentación de los links de navegación en todas las páginas del sitio
- Indicador del camino
  - Evitar confundir al usuario al cambiar desde la home page a su página actual
  - Evitar la estimación

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**Criterios de diseño de WWW**

**Criterios globales: calidad**
- Mapa del sitio
  - Refleja un modelo mental claro al visitante acerca de la estructura del sitio
  - Acelerador para la navegación del sitio
- Motor de búsqueda interno
  - Facilita la localización de información específica
- Fecha de última actualización del sitio
  - Permite al visitante determinar si la información es actual
- Formulario de cuestiones y/o sus generales
  - Comunicación con los visitantes del site
- Pregunta de FAQ
  - Ayuda de importancia para los visitantes

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**Criterios de diseño de WWW**

**Criterios globales: subelidad**
- Arquitectura lógica de la información
  - Proporcionar un ordenación lógica de los contenidos del sitio
  - Paralelo la adopción del modelo mental del visitante
  - No un "tall" de datos
- Información no relacionada con el sitio
  - Evitar la presencia de datos de la información
  - De menor número en el sitio
  - Descarta al usuario acerca de la información contenida
- Proporcionar un diseño atractivo unificado
  - Utilizar métodos adecuados
- Garantizar la calidad de la información
  - Los usuarios hacen información
  - La información debe ser confiable e interesante
  - Una alta calidad facilita la lectura al los visitantes

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**Human-Computer Interaction**

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Web Design patterns

Motivation for Design Patterns

- Design is about finding solutions
- Unfortunately, designers often reinvent
  - hard to reuse solutions
- Design patterns are a solution
  - reusable knowledge of what works well
  - First used in architecture [Alexander]
  - Communicate design problems & solutions
    - how big doors should be & where...  
    - how to create a beer garden where people socialize...
- Not too general & not too specific
  - use solution "a million times over, without ever doing it the same way twice"
- Design patterns are a shared language
  - A language for building and planning towns, neighborhoods, houses, gardens, and more.

Example from Alexander: Alcoves

Make small places at the edge of any structure, usually no more than 1 by wide and 1-1/2 by long, possibly much smaller. Door doors should be large enough for two people to sit, but not so large as to contain a desk or table.
Design Patterns

- Mosaic of Subcultures
  - (31) Promenade
  - (33) Night Life
  - (90) Beer Hall
  - (95) Building Complex
  - (179) Alcoves
  - (181) The Fire

Class Gatherings Intensities

Design Patterns

- Nail used in software engineering [Gamma, et al.]
  - Composite
    - Motivation: Abstracts a common composition in such a way that a client need not know the difference between a single and a composite object
    - Applicability: When dealing with hierarchically-organized objects (e.g., columns) containing rows containing contents
  - Consequences
    - Client's view has both a map and map details object
    - maps are stored by

Design Patterns

- We can do the same for Web Design
  - Communicate design problems & solutions
    - How can an app show a heap of traffic?
    - Are the days of shopping in physical stores with
  - How do users communicate new ideas to customers?
    - It's as important in terms of the standard -- are you

- Now used in Web design [Ven Duane, Landay, & Hong]
  - The Design of Sites
  - Communicate design problems & solutions
    - How to create navigation bars for finding relevant content?
    - How to design a website that suggests checking
    - How to make e-commerce sites that engage people
Web Design Patterns Book

Patterns broken into related groups
- Site genres
- Navigation framework
- Home page
- Content management
- Trust and credibility
- Basic commerce
- Advanced commerce
- Completing tasks
- Page layouts
- Search
- Page-level navigation
- Speed

All patterns documented using the same format
1. Problem Title
2. Background Information
3. Problem Statement
4. Solution
5. Solution Sketch
6. Other Patterns to Consider

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HOMEPAGE PORTAL (C1)

Problem: without a compelling home page (HP), no one will ever go on to the rest of your site
- Problem
  - Survey says 80% of visitors leave after HP
  - HP should never have back-to-top links, etc.
  - HP is portal through which most visitors pass.
  - They must be able to simultaneously balancing a large number of issues, including branding, navigation, content, and the ability to download quick-Hp

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HOMEPAGE PORTAL (C1) Design Rules
- Breadth on left
- Highlights articles of general interest in center & right
- Links distinct visited
- Subsections further down show more detail in particular areas
HOMEPAGE PORTAL

■ Make a positive first impression
  ■ uses DESCRIPTIVE, LONGER LINK NAMES (K9) and FAMILIAR LANGUAGE (K11)
  ■ understanding customers
    ■ who are they? contextual inquiry, surveys
    ■ appropriate colors, graphics?
  ■ rear green & screaming graphics on a skateboarding site, but not on a business or health site

HOMEPAGE PORTAL

■ Focus on a single item of interest
  ■ create a CLEAR FIRST READ (K3)
    ■ draw the eye to a single graphical item
    ■ make it clean, larger than rest of page
  ■ cut down remaining elements to chosen few

HOMEPAGE PORTAL

■ Build your site brand!
  ■ present the message of what your company does
  ■ include
    ■ good value proposition (K1)
    ■ promote your site
    ■ links to important locations
  ■ are you located in a?
HOMEPAGE PORTAL

- Make navigation easy to use
- Ask people & experts must instantly "get it"
- Use MULTIPLE WAYS TO NAVIGATE (B1)
- Use features of life as EMBEDDED LINKS (C2)
- NAVIGATIONS BARS (K2)
- There are several types
- HTML POWER (L4)
- Light colored
- Use graphics to generate new sections
- REUSABLE IMAGES (L5) to highlight new things

HOMEPAGE PORTAL

- Make it download quickly (2-3 seconds)
- It not, they'll go elsewhere

Strategies for quick downloads

- Use HTML POWER (L4) (and as much as possible)
- Optimize all graphics
- Optimize all server interactions
- Optimize all browser interactions
- Optimize all browser and text

Hall of Shame!

- No CLEAR FIRST READ (3)
- Links to basic areas?
- Doesn't make navigation easy
- Bleeding-edge edge tech?
- Doesn't download fast

http://www.bestshames.com/
Hall of Shame

- College of Arts & Crafts
- 1564 W. Main St.
- Phone: (415) 123-4567
- Fax: (415) 567-8901
- Email: info@arts-and-crafts.com

What is this page about?
- No text
- No value proposition
- How do I navigate?
- Only links at the very bottom
- Font is too small; you can't read all on high-res monitor

Homepage Portal (C1) Design Rules

- Make a good first impression
- Good style, large 3/4 normal (10)
- Focus on a single form of interest
- Keep it clear and readable (10)
- Build your brand
- Use front and back pages (12)
- Use a single primary color

Homelessness

- Lure visitors to return
- Use Personal and Content (14)
- Group related items (12)
- Keep Pyramid Writing Style (17)
- Make it download quickly
- No, real (10)
- Best: Downloading images (12)
- Good Layout (17)

Inverse Pyramid Writing Style (D7)

25% slower to read from a computer screen

Problem
- Web users want immediate gratification or they will leave—They want web pages that are
  - Delivered quickly
  - Easy to use
  - Quick to skim

Solution (7)
- Give the conclusions first
- edit the clair for those
  - Want it

Inverse Pyramid Writing

Most Important Info

- Background Information
  - Suggesting Details
  - Long Journals
Journalists Use Inverted Pyramid

From www.nytimes.com

ZDNet Uses Inverted Pyramid

- Start with a good concise title
- Reflect the content
- Continue with the most important points
- Use hypertext to split up information
- People often won't scroll or read
- Use less text
- 50% less than you would offline
- Use a simple writing style
- Simple sentences -- no hype or advertising
- Use EMBEDDED LINKS (K7) to help visitors find more information
- Use bullets and numbered lists
- Supports skimming

Using Bullets
Shopping Cart

How to allow customers to purchase multiple items in one transaction

- use shopping cart interface to keep track of items before customer finalize the purchase
- track item, quantity, availability, & price
- Make it easy to add items from product pages
- minimize the number of steps
- warn customers, but many ask don’t do it

Shopping Cart

Provide detailed info on each item in cart

amazon.com

Shopping Cart

Provide info about all items in cart

- subtotals
- shipping, taxes, other charges (if known)
Shopping Cart

Provide a prominent link to CHECKOUT

Have a link to let people continue shopping

Process Funnel (H1)

Customers often need to complete highly specific tasks, but pages which are tangential links and many questions can prevent them from carrying out these tasks successfully.

Desktop Solution: Wizards
Process Funnel (H1)

A process funnel lets people complete their goals by breaking down complicated tasks into a small number of steps.

- Using pop-up windows for detailed information, and reducing the number of links to only the critical ones, so that people are never distracted.

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Process Funnel (H1)

- Problem – How much longer?
- Solution – Progress bars

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Process Funnel (H1)

- Problem – Why ads and nav bars?
- Solution – Remove them and present minimal interface

- New problem – What site?
- Solution – Keep the logo, layout, colors

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**Process Funnel**

- Problem - What if users need help?
- Solution - Use pop-up windows because we want to keep people in the funnel.

![Diagram of a process funnel with flow arrows and sections labeled: E-Commerce, Web Apps, Intranets, Navigation Bars, Context-Sensitive Help, Tab Rows, Action Buttons, High-Viz Action Buttons, Preventing Errors, and Meaningful Error Messages.]

**Related Patterns**

*Process Funnel (H1)*

- (A1) E-Commerce
- (A10) Web Apps
- (A11) Intranets
- (K2) Navigation Bars
- (K10) Context-Sensitive Help
- (K3) Tab Rows
- (K12) Above the Fold
- (K4) Action Buttons
- (K5) High-Viz Action Buttons
- (K13) Preventing Errors
- (K13) Meaningful Error Messages

**Meaningful Error Messages (K13)**

- Problem - When users make mistakes, they need to be informed of the problem and how to recover.
- Solution
  - Clear statement of problem
  - Explain how to recover
  - Position near the problem.
Meaningful Error Messages (K13)

- Clear error message
- Explain how to recover
- Positioned (relatively) near problem

Dell

WELCOME TO CHECKOUT

Pattern Examples (K2)

Navigation Bar
Web Design Patterns

(A1) Personal E-Commerce
- (H1) Process Funnel
  - (F1) Quick-Flow Checkout
    - (l1) Grid Layout
    - (l2) Above the Fold
- (F3) Shopping Cart
- (K4) Action Buttons
- (L2) Fast-Downloading Images

Further Reading
Websites on Web Design
- UsableWeb.com, links to other usability sites
- Usability.gov, for building accessible websites
- Web pages that suck, at http://www.webpagesthat suck.com/
- Net tips for designers, at http://www.jspiegol.com/tips/
- User Interface Engineering, at http://www.ui.e.com
Further Reading

Websites on Web Design

- New York Times Ecommerce Times, at
- Webword.com usability log
- CNet Builder.com, info on building sites
- ACM's CHI-Web Mailing List
  http://www.acm.org/sigchi/tech/wm/html
- Goodexperience.com weblog
- Jakob Nielsen useit.com