Web Site Design

Cleaning up the WWW – the world wide wastebasket
What do we mean by the Web?

• “Invented” by Tim Berners-Lee around 1991 with the HTTP protocol and HTML standard.
• Got a boost with MOSAIC (first widely available GUI browser) and Netscape and IE.
• The Web:
  – Does use HTTP
  – Does use URLs and DNS
  – Allows hyperlinking of resources (Pages, sites, files, etc.) to each other
  – May use a browser, may not.
  – May use HTML, may use XML, may use something else.
• The web is a set of protocols and tools that run on top of the Internet.
So what’s the Internet then?

- A set of interconnected LANs and backbones that route IP based message packets between source and destination
- Protocols:
  - IP, TCP, UDP
  - FTP, POP3, SMTP, IMAP
  - DNS, ICMP, BGP
  - Gopher, WAIS, Veronica, … (older replaced by web mostly)
We will concentrate on Web Sites, Pages and Applications

- HTTP
- HTML or XML
- Uses a browser or an application that provides a GUI by communication over HTTP
- A thin client desktop application – most of the apps logic and data are on the server machine
A few quick web definitions

- A web page – whatever gets shown in the browser window that comes from the server
  - static HTML file
  - CGI generated HTML
  - Server side Java application generated HTML
  - JavaScript that runs in the users browser (client side)
  - Pretty much anything else that displays in a browser as HTML and is sent by a server.
A few quick web definitions

• A web **site** – all the content that is reachable from a given URL or subpages/apps on that URL

• A web **application** – something that has more complex behavior that just navigation between pages, searching or browsing. Some business logic must execute on the server (not just navigational logic).
A few quick web definitions

• A **hyperlink** – a clickable part of a web page that causes the browser to send data to the server that moves you to a different part of a site or a totally different site all together.

• A **action button** – causes an action to happen that may be the same as a hyperlink or may submit data (form) or may cause something to happen in the browser without sending anything to the server (client side scripting)
The web as it exists today

- Is a **client/server** based protocol. The browser **asks the server** to do something and it responds by returning some HTML to the browser. It is request/response oriented.

- Versus most GUIs which are now **event oriented**. A **control** can send an event that is received by a piece of **code** that is listening for those types of events. The code could send an event **to the control**, without the control ever having sent a previous event the code. Controls and handlers are **peers not client/server**.

- The Web model is about **ten years** behind with respect to the richness of what it can do as a user interface. Primarily due to the client/server nature of **HTTP**.
Myths about web design
(things that are NOT true)

1. The Web is totally different than desktop GUIs
2. The Web is all about content
3. The Web is easier to design for than the desktop
4. A web page is the same as a web application
5. Changing the look and feel of a website is a good thing
Myths about web design
(things that are NOT true)

6. The Web and the Internet are the same thing
7. Web apps are faster to build than desktop apps
8. Web design is all about the presentation layer (think MVC)
9. The web is all about HTML
10. The Web is here to stay
Myth 1 - The Web is totally different than desktop GUIs

• Same design considerations but a weaker set of controls and interaction mechanisms than the desktop.
  – Ex: No **drag and drop** in most web apps. Its not a part of the HTML standard. You need extra controls (ActiveX) usually. Maybe, flash, etc.

• You still need to understand the user and their needs.

• The browser is in many ways like a **Windows 3.0** version GUI engine. It has very primitive capabilities compared to WinXP, KDE, GNOME or OS X.
Myth 2 - The Web is all about content

- It was that, when static pages were all the rage. More and more content is dynamically generated.
- Behavior of a web application is what’s becoming most important. Pushing a button does more than retrieve a page. It has rich functionality and business logic.
- The browser is becoming an OS platform independent, GUI “engine” that is also very thin client (think peer not client in the future).
- Many protocols like Web Services and XML are oriented towards non-visually formatted content being exchanged between application NOT between a browser user and HTTP server.
Myth 3 - The Web is easier to design for

- You have **fewer** control choices
- You have less control over the **size** of the browser window, colors, **resolution**, etc. versus a desktop app.
- HTTP isn’t a great protocol for GUI operations. Its designed to send **whole documents** not just a message like “I pressed the OK button”
- Many different **versions** of browsers available
- Possible that your app could have 10,000,000 **users** trying to hit it at the same time.
- If you use other than HTML, Java Applets and JavaScript you may have **compatibility** problem or require downloading controls (Flash, Shockwave, JVMs, ActiveX)
Myth 4 - A web page is the same as a web application

• While a webpage is mostly information maybe some images and limited navigation, web apps have much more complex behavior. This behavior is **harder** to achieve than a desktop app.
Myth 5 - Changing the look and feel of a website is a good thing

• Changing the look and feel of anything means the user may have to **re-learn** how to use it. This can take time and energy that a user may not be willing to spend.

• What are the **goals** of the user of a web site/app?
Myth 6 - The Web and the Internet are the same thing

• The web is HTTP and HTML. You can build an **Internet** application that is NOT a web app.
  – Ex: Microsoft Instant Messenger – runs over the Internet using IP (Not HTML or HTTP)
Myth 7 - Web apps are faster to build than desktop apps

- It’s a **less developed** platform for rich interactions. More functional web UIs require more work to overcome this.
- Splitting the app between client and server adds **complexity** to the design in order to get scalability.
- It is getting **easier** with tools like Flash MX, VisualStudio.Net WebForms, Java Struts and Java Server Faces
Myth 8 - Web design is all about the presentation layer (think MVC)

- The presentation of the HTML is only one part of the design.
- Important design considerations
  - Navigation style and structure (info arch)
  - Data storage and retrieval
  - Concurrency of users
  - Security
Myth 9 - The web is all about HTML

- Protocols & technologies to think about
  - XHTML
  - XML
  - SOAP and WebServices
  - XForms
  - SIP
  - JXTA
  - BEEP
  - Web Portals
Myth 10 - The Web is here to stay

• The Web is a temporary technology set.
  – **HTTP is dying.** (Client server is so 70’s – think IBM Mainframes and CICS)
  – **HTML is dying.** (as are WAP/WML, cHTML, …)
  – **DNS is dying.**
• The browser isn’t just for browsing anymore. Is it really a “browser” anymore? Its really a **presentation layer manager.**
• Watch for XSL, XSLT, XPath, XLink, JINI, JIRO, JavaSpaces, Altio, Gaia, GRID, , …. 
• The web will be replaced by something better richer and easier. What? I’m not sure.
Web Design Types
Web Design Types

• Brochureware
• eCommerce Sites
• Web based UIs for applications that would normally have a desktop UI
• Search engines & Webcrawlers
• ASP – Application Software Provider & Zero install desktop
• Marketplaces (Aggregators)
• Composite Sites - Rebranding and Facades for other site
• Portals – a user configurable “desktop” you pick what shows up on you desktop (in your browser)

<<note these are not mutually exclusive – one site might be all of the above types>>
Brochureware

• Mostly just introductory level information (text), images, audio or video.
• Purpose is to “market” to the visitor. Get them excited about the company or institution.
• Like a brochure for a College or Company.
• Not heavily revisited by the same user
• www.nyu.edu is in part this.
eCommerce Sites

• Sell something to an end consumer over the web.
• Usually has a catalog of products or services available to pick from.
• Support a “shopping cart” to drop things into
• Allow payment by online check, credit card, account or COD.
• 24 hour shopping – no store required – “clicks versus bricks”
• www.Amazon.com
Web based UIs for apps

• Provide a thin client (browser based) UI for a traditionally desktop application.

• Require zero software installation to use the application

• Rapid deployment to many users (because of zero install)

• Example:
  – HR, payroll, ERP, CRM, SFA, ERM, wordprocessing, collaboration tools
    (email, IM, virtual conference rooms)
Search engines & Webcrawlers

• Catalog the sites that are available on the Web. They allow finding a site by specifying search words to find sites, pages or content.

• Crawlers look through pages/content of a site and create search indexes.

• Allow searching either Internet or a specific site for matching content

  • www.yahoo.com
  • www.google.com
  • images.google.com
ASP – Application Service Provider & Zero install desktop

• Buying the functionality provided by an application from an ASP without installing or hosting anything on your companies systems.

• A variation on a web UI for desktop app except all the application parts are hosted and managed by a company you buy/rent the service from.

• Online banking could be thought of as this
Marketplaces (Aggregators)

• Exchanges - Bring together buyers and sellers.
• Auctions, reverse auctions, clearing house, ...
• **Retail** (B2C) – radios, cars, vacations, ...
  – Online malls, Expedia.com, nasdaq.com?
• **Wholesale** (B2B) – bulk quantity sales. Raw materials to manufacturers or retailers
  – http://www.chemconnect.com/
• **Resale** (C2C) – used merchandise auctions
  – eBay.com
Composite Sites - Rebranding and Facades for other site

• Sites that provide a **front end** to a different system/web site hiding the actual identity of the system you are connecting with.
• B&N is hosted by Amazon.com
• Hotels.com
  – 40,000 affiliates that “sell” hotels.com inventory
  – Hosted - Hotels hosts sites for mom and pop’s
  – Integrated - Hotels allows you to embed “commands” in your website to “talk” with their servers and get fragments of HTML back to incorporate into your webpages. A box that says Hotels.com appears in your website
  – Rebranded – nobody but Hotels.com knows that you are a Façade to hotels systems. The customer doesn’t know they are actually buying from hotels. It is “transparent” to them.
• Expedia.com, Match.com, …
Welcome
Travel Centric offers deep discounts on all travel services, including hotel reservations, airline tickets, car rentals and vacation rentals. Discounts are as high as 70% off and we can guarantee the lowest rates on the Web because we're partnered with multiple providers to give our customers aggregate saving power. Start Traveling - and saving - today!

<table>
<thead>
<tr>
<th>Travel Options</th>
<th>Travel Options</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Flights</strong></td>
<td><strong>Hotels</strong></td>
</tr>
<tr>
<td><strong>Search for Hotels</strong></td>
<td><strong>Search for Hotels</strong></td>
</tr>
<tr>
<td>Destination City:</td>
<td>Check-in:</td>
</tr>
<tr>
<td>Adults per Room:</td>
<td>May</td>
</tr>
<tr>
<td>Number of Rooms:</td>
<td>Check-out:</td>
</tr>
<tr>
<td>2</td>
<td>May</td>
</tr>
<tr>
<td>1</td>
<td>12</td>
</tr>
</tbody>
</table>

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Portals

- Allows a user to **pick** what content is displayed on their web desktop (**customize**)
- Multiple websites are **aggregated** together to produce a single page in the browser – fragments of HTML coming from several web servers that get put together with HTML to make a legitimate page to return to the browser
- Web host can control what portlets (small parts of the page that you can customize) you get to pick from
- You can place the portlets on the page and where you want them on the page.
- A portal can be thought of as a **UI-let server** – like a J2EE engine can host business logic in the form of EJBs, a Portal server can host **UI components** (portlets)
- Portals can have multiple “**communities of interest**”. You may / may not be a member and if not a member, you may not have access.
- [my.yahoo.com](http://my.yahoo.com)
My portal on my.Yahoo.com
My newly customized portal
Web Design Rules

Some basics
General Aspect of Web Design

- Layout
- Navigation
- Images
- Text
- Color
- JavaScript
- Flash
- Resolution
- Browser support
- Content
- Usability
10 golden rules – these are (almost) always true

1. Avoid dancing baloney
   – don’t be cute. Avoid animations, flash, shockwave, downloadable controls.

2. Be consistent from page to page
   – locations, colors, sizes, arrangement

3. Make the page scan able more than readable

4. You probably have too much text on the page

5. Use style sheets
   – CSS or XSL
6. People hate scrolling
   – limit page size to 1 and ½ screens full at the target resolution
     Avoid horizontal scrolling if at all possible.
7. White space (negative space) is like the grass around a house,
   that emptiness makes things look better.
   – >30% whitespace per page
8. Provide hints and clues to the user that tells them where
    they are and how to get to where they want to.
    – bread crumbs and tree controls.
9. Frames are dangerous
   – avoid them unless you’re sure you know what you’re doing and HEAVILY test your design.

10. Avoid busy background (or backgrounds at all)
    – Black text on white background is still easiest to read and print, try that first.

A lot of very well known sites violate the rules and are still pretty bad. Follow the rules, instead of following the leader, unless they are doing it right, then copy them!
The hyperlink

• It's like a command button that can either:
  – “Launch” a new page – in the same browser window or a new window
  – Change your position on a page
  – “Launch” a site
  – Kind of like a dialog box that has a button that launches a new dialog box (and destroys the previous dialog box)

• Should be **underlined**! If you choose not to you should be consistent and provide some indication that it’s a link otherwise you force the user to “minesweep”.

• A link should change color if its been traversed. Stick with the standard colors.
The action button

• Standard button that occur in HTML forms.
• They cause either an HTTP POST or GET
• They can be used to do things like a hyperlink. They can’t show you that you’ve already traversed this link. Thus they should only be used for the highest level in the navigation structure (Level 0) or highly traversed links.
Hover button

• A variation on a action button that is actually a java applet.
• Treat like action buttons for most design rules.
• May not work in all browsers because it’s a downloaded applet!
Sample web links and buttons

This is a hyperlink, this one has been traversed.

These are action buttons:

Button      Submit      Reset

This is a hover button: I'm a hover button
HTML for those buttons

<form method="POST" action="_derived/nortbots.htm">

This is a <a href="homework_5.htm">hyperlink</a> &nbsp; this one has been <a href="new_page_1.htm">traversed</a></p>

<p>These are action buttons</p>
<input type="button" value="Button" name="B3"><input type="submit" value="Submit" name="B1"><input type="reset" value="Reset" name="B2"></p>

<p>This is a hover button
<applet code="fphover.class" codebase="." width="200" height="24">
   <param name="color" value="#000080">
   <param name="hovercolor" value="#0000FF">
   <param name="textcolor" value="#FFFFFF">
   <param name="effect" value="glow">
   <param name="text" value="I'm a hover button ">
</applet></p>

</form>
Button Rules

- Similar to standard button and button and toolbar rules in app UIs
  - Consistent size, look, colors
  - Good labels or good icons
  - Trigger actions
  - Tooltips (if supported by your dev tools)
Its easy to get lost on the web

- It's hard to tell how big ("height", "width" and "depth") of a website.
- Hard to tell **where I am**, have been and going to, without help from the designer.
- Give me a way to get back home to the top of the site – **SitelID**
- Provide **stable** navigation – global (persistent) menus should stay the same on all pages if possible
- Don’t change the choices or order on a menu based on things I’ve done.
Branding
Branding

[Logos and images of Yahoo!, Amazon, McDonald's, BP, Pepsi, New York University, Greenpeace, World Wildlife Fund, and United Nations]
Branding

• Provides an impression about a company, organization or product
• It is easily recognizable
• Things with the same brand are assumed to have similar aspects/qualities/affiliations
• Its like attaching an emotion to a corporate marketing identity
Layout

• Vertical Columns – 1, 2, 3, …

• Horizontal segments – and segment within segments, indenting
Layout (2)

- Whitespace and grouping
- Justification
- Indenting
- Balance
- What is navigation?
- What is content?

Best: Consistent, Simple and Logical
Images – still and motion

- File Size
- Quantity on a page
- Type – gif, jpeg, png, WMF, AVI,
- Value of the images?
- Like icons – should help use to understand not confuse them. Metaphors are OK.

Best: Small, Consistent and Provide Value
Text

- Typefaces
- Fonts
- Colors
- Writing style – voice, point of view, sophistication of words and sentences

Best: Consistent, Fewer, Simple and Patterned. Spell check and Grammar check.
Color

• Brand colors
• Layout colors used for grouping and conveying meaning

Best: Use graphic design color rules and usability color rules.
Client Side Scripting

- JavaScript
- Flash
- Others
- Provides animation and behavior on the client

Best: Limited to what needed. Can impeded compatibility.
Resolution

• What resolution is the target for the site?
  – 640 x 480, 800x600, 1024x768, 1280x1024, ...
  – Colors? – 256, 16 bit, HiColor

Best: Test in a few sizes and plan for the res increases in the future.
Resolution
Browser support

- IE, Netscape, Mozilla, Opera, AOL, Lynx, Safari, …
- Different versions?
- What about other devices like PDAs and Phones?

Best: Stick with standard HTML and JavaScript in the browser. Test, test, test.
Content

• That’s a whole course in itself
• Should make sense with respect to the brand and purpose of the provider and the site.
  – Ex: if the NYU site sold electronics (VCRs, etc.) would it make sense?

Best: Consistent, efficient, logical and appropriate.
Usability

- How well does a site work for a given group of users.

Best: Test early, Test often, Listen to users, Check web server logs
Global Navigation styles

• Horizontal Global Navbar

• Vertical Global Navbar

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Tabbed Horizontal Navbar

- Good for sites that need to organize very large amounts of pages and functionality. Much like in desktop apps they help to maximize screen real estate

- What’s bad about this example?
Cascading Vertical Navigation

• Gives good feedback to the user about where they current are.
• What is bad about this example though?
Parts of a page and Menus

- Header (Banner) or Masthead
- Global (high level) Navbar
- Local Menu
Rule - Always provide ALT txt for images
Good examples of ALT text
HTML for ALT text

<img src="tool button.gif" width="600" height="150" border="0" alt="Tools">
What if you are color blind?

Rule – check that your colors are good in reduced colors and in grayscale
The Homepage

• It’s the defined entry point into the site/app
• Its like the front door – it’s the first impression that a user gets of the site (usually)
• Can be a different layout than all other pages of the site (you can ignore some consistency here)
• Goal:
  – Identify “who” the site is
  – What you can find or do here
  – Test the user the what the purpose and content of the site is (supposed to be at least)
Homepage Rules

• **One screen** – no scrolling – at target resolution
• **Brand** the site – make it obvious what site I am at
• Provide navigation to the **major** sections of the site or the top level menus if a web app
• Provide a **search** capability if applicable
• Provide a link to the sites info arch page (a **site map** page)
• **Less is more** – don’t junk it up with everything you squeeze into the page.
General Page Rules

• Better to recognize than force me to remember – show me **choices** and organize them into logical **groups** and hierarchies

• Make it easy for me to understand what’s **important** and what’s less important
  – Size – bigger is more important
  – Indent
  – Position – closer to the top is more important

• Make it easy for me to understand what to **click**
  – Underline
  – Position
  – Color
  – Shape (Buttons)
  – Hints (Arrows, icons, diamonds, …)
General Page Rules (2)

• Create a layout grid that are templates for pages. This helps provide consistency.
  Ex:
  – Homepage Grid Layout
  – News page layout
  – Product page layout
  – Service page layout
  – Class schedule layout
  – Class info layout
  – Professor info layout
  – Function (web app) layout
Example Layout
General Page Rules (3)

• Tell me where I am on EVERY page
• Tell me how I got here – bread crumbs
General Page Rules (4)

• Don’t make something look like its really something else.
  - General: Overview, Search, Job Openings, Contact Info, Directions
  - People: Faculty, Research Staff and Guests, Students: PhD, MS CS, MS IS, Alumni, In Memoriam

• Use the existing conventions, if possible and they exist.
• Limit the clicks I need to make to get to where I want to be
• Limit the search set size to a reasonable size (20-100 max in most cases)
• Lower the visual noise
  – Limit colors, typefaces, font sizes, type styles, vertical alignments, text, images, animations, blinking.
Level 0 – eBay Homepage
Level 1 - Browse page of the site
Level 2 – an item up for auction

http://cgi.ebay.com/ws/eBayISAPI.dll?ViewItem&item=2525415899
Level 2 – Different item
Level 0 - [www.chemconnect.com](http://www.chemconnect.com)
Level 1 - Tools page

Overview
If lowering transaction costs and reducing process inefficiencies are on your business agenda, then using ChemConnect's innovative solutions is the best way to achieve your goals. Through a unique combination of market information, industry expertise, e-commerce solutions, and an active network of trading partners, ChemConnect helps buyers and sellers of chemicals, feedstocks, plastics, and related products optimize their purchasing and sales processes.

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Level 2 – Marketplace reached by specialty navigation
Level 2 - Platform

Commodity Markets Platform
ChemConnect's Marketplace is home to a Commodity Markets Trading Platform (Chalkboard), where pre-qualified producers, consumers, distributors, and traders prefer to complete global spot and forward transactions - including clearing and settlement - of natural gas liquids (NGLs), aromatics, oxygenates, olefins and polymers in real time.

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- Actively manage price and margin risk using over-the-counter financial transactions or future trades through our exclusive partnership with Chicago Mercantile Exchange.
- Develop reliable price indices based on real-time completed transactions by closing deals on ChemConnect.
- Take advantage of ChemConnect's clearing and settlement services through our agreement with Guaranty Clearing Corporation:
  - Eliminate counter-party credit risk and benefit from increased liquidity in the forward market.
  - Trade completely anonymously when your market needs dictate.
  - Leverage your available credit by using commodity-netting capabilities.

How You Benefit:

ChemConnect's Chalkboard Commodity Markets Platform is a critical

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Level 3 page
A different Level 1 page
Below the fold
Even more below the fold
Google
– where whitespace is King!
Critique

• Purpose Summary?
• Types of users and their goals?
• General
  – Excellent?
  – Good?
  – Bad?
  – Horrible?
• Layout
• Navigation
• Images
• Text
• Color
• JavaScript
• Flash
• Resolution
• Browser support
• Content
• Usability
HW#5

• Will be assigned next week Monday
• Due May 10\textsuperscript{th} day of the final
• Final exam is May 10\textsuperscript{th}