Designing RIA Accessibility: A Yahoo UI (YUI) Menu Case Study

Capacity Building Institute
Seattle, Washington
2006.11.30

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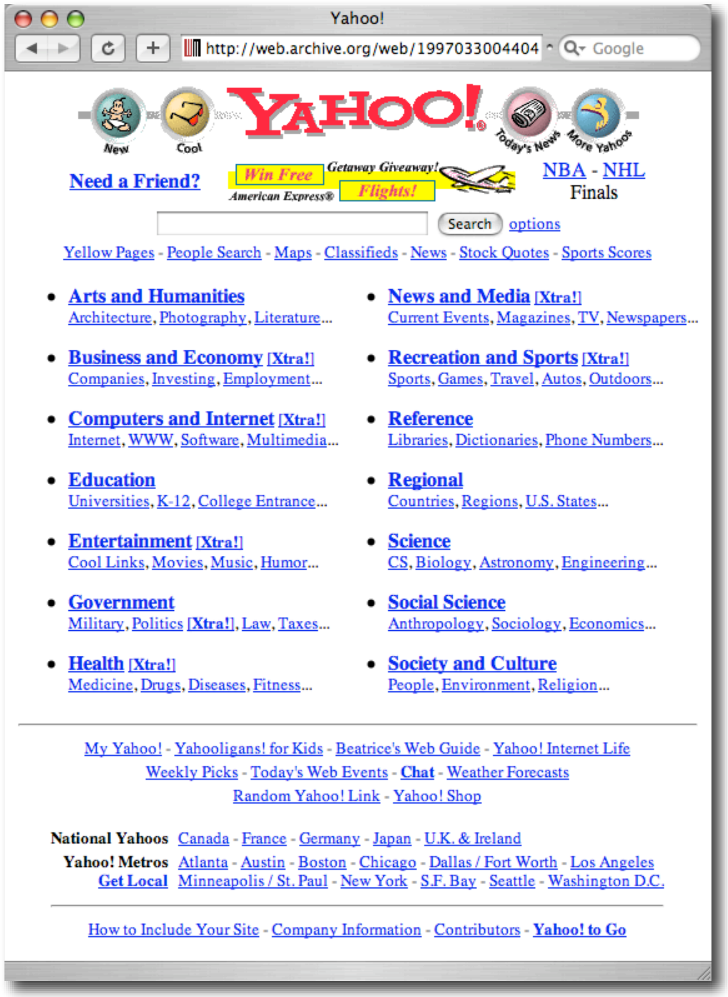
What’s Happening?

Web 1.0 vs. Web 2.0



Yahoo!

http://web.archive.org/web/1997033004404

New · Cool · Today's News · More Yahoos

Need a Friend? · Win Free Flights! Getaway Giveaway! American Express® · NBA - NHL Finals

Search · options

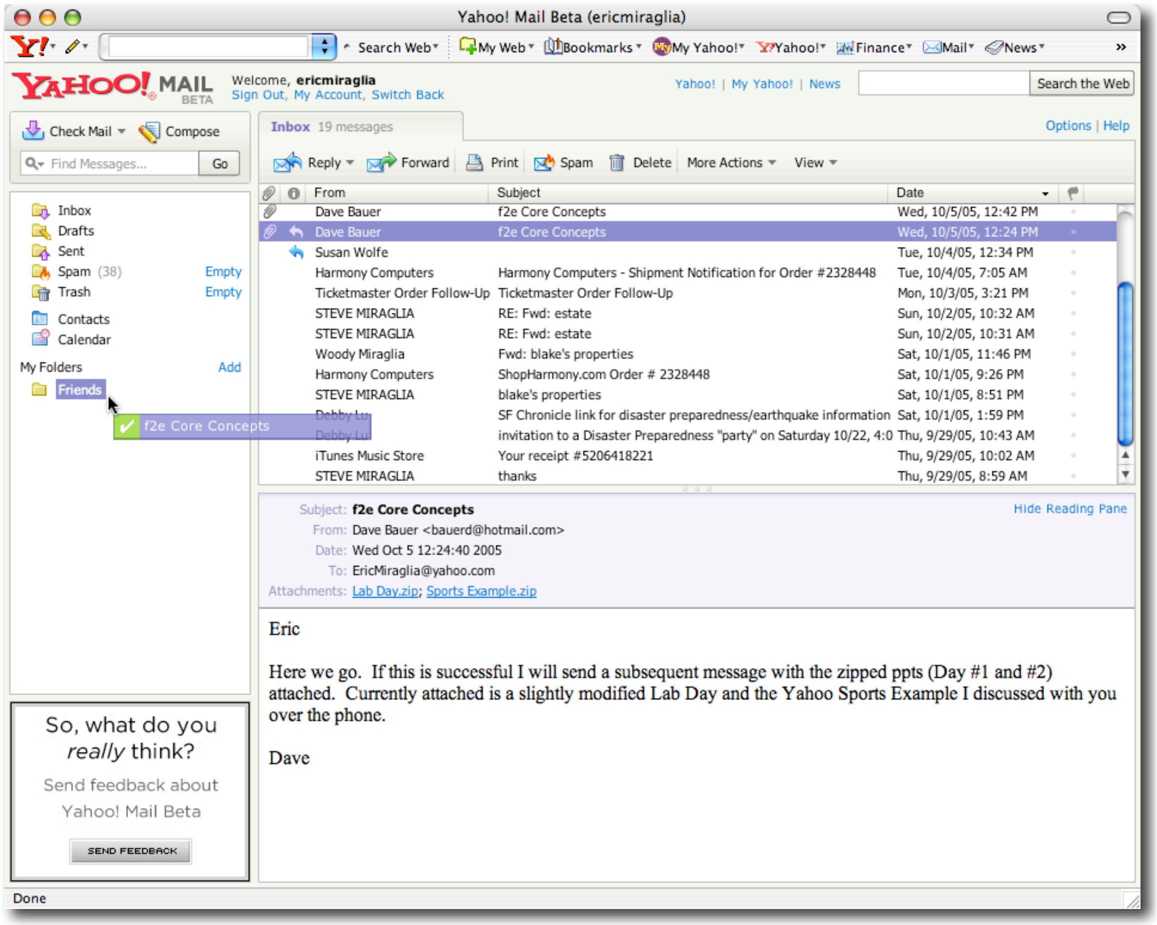
Yellow Pages - People Search - Maps - Classifieds - News - Stock Quotes - Sports Scores

- **Arts and Humanities**
  Architecture, Photography, Literature...
- **News and Media** [Xtra!]
  Current Events, Magazines, TV, Newspapers...
- **Business and Economy** [Xtra!]
  Companies, Investing, Employment...
- **Recreation and Sports** [Xtra!]
  Sports, Games, Travel, Autos, Outdoors...
- **Computers and Internet** [Xtra!]
  Internet, WWW, Software, Multimedia...
- **Reference**
  Libraries, Dictionaries, Phone Numbers...
- **Education**
  Universities, K-12, College Entrance...
- **Regional**
  Countries, Regions, U.S. States...
- **Entertainment** [Xtra!]
  Cool Links, Movies, Music, Humor...
- **Science**
  CS, Biology, Astronomy, Engineering...
- **Government**
  Military, Politics [Xtra!], Law, Taxes...
- **Social Science**
  Anthropology, Sociology, Economics...
- **Health** [Xtra!]
  Medicine, Drugs, Diseases, Fitness...
- **Society and Culture**
  People, Environment, Religion...

My Yahoo! - Yahooligans! for Kids - Beatrice's Web Guide - Yahoo! Internet Life
Weekly Picks - Today's Web Events - Chat - Weather Forecasts
Random Yahoo! Link - Yahoo! Shop

National Yahoos Canada - France - Germany - Japan - U.K. & Ireland
Yahoo! Metros Atlanta - Austin - Boston - Chicago - Dallas / Fort Worth - Los Angeles
Get Local Minneapolis / St. Paul - New York - S.F. Bay - Seattle - Washington D.C.

How to Include Your Site - Company Information - Contributors - Yahoo! to Go



Yahoo! Mail Beta (ericmiraglia)

Search Web · My Web · Bookmarks · My Yahoo! · Yahoo! · Finance · Mail · News

YAHOO! MAIL BETA · Welcome, **ericmiraglia** · Sign Out, My Account, Switch Back · Yahoo! | My Yahoo! | News · Search the Web

Check Mail · Compose · Find Messages... · Go

Inbox · Drafts · Sent · Spam (38) Empty · Trash Empty · Contacts · Calendar · My Folders Add · Friends

f2e Core Concepts

Inbox 19 messages · Options | Help

Reply · Forward · Print · Spam · Delete · More Actions · View

From	Subject	Date
Dave Bauer	f2e Core Concepts	Wed, 10/5/05, 12:42 PM
Dave Bauer	f2e Core Concepts	Wed, 10/5/05, 12:24 PM
Susan Wolfe		Tue, 10/4/05, 12:34 PM
Harmony Computers	Harmony Computers - Shipment Notification for Order #2328448	Tue, 10/4/05, 7:05 AM
Ticketmaster Order Follow-Up	Ticketmaster Order Follow-Up	Mon, 10/3/05, 3:21 PM
STEVE MIRAGLIA	RE: Fwd: estate	Sun, 10/2/05, 10:32 AM
STEVE MIRAGLIA	RE: Fwd: estate	Sun, 10/2/05, 10:31 AM
Woody Miraglia	Fwd: blake's properties	Sat, 10/1/05, 11:46 PM
Harmony Computers	ShopHarmony.com Order # 2328448	Sat, 10/1/05, 9:26 PM
STEVE MIRAGLIA	blake's properties	Sat, 10/1/05, 8:51 PM
Debby Lu	SF Chronicle link for disaster preparedness/earthquake information	Sat, 10/1/05, 1:59 PM
Debby Lu	invitation to a Disaster Preparedness "party" on Saturday 10/22, 4:0	Thu, 9/29/05, 10:43 AM
iTunes Music Store	Your receipt #5206418221	Thu, 9/29/05, 10:02 AM
STEVE MIRAGLIA	thanks	Thu, 9/29/05, 8:59 AM

Subject: **f2e Core Concepts** · Hide Reading Pane
From: Dave Bauer <bauerd@hotmail.com>
Date: Wed Oct 5 12:24:40 2005
To: EricMiraglia@yahoo.com
Attachments: Lab Day.zip; Sports Example.zip

Eric

Here we go. If this is successful I will send a subsequent message with the zipped ppts (Day #1 and #2) attached. Currently attached is a slightly modified Lab Day and the Yahoo Sports Example I discussed with you over the phone.

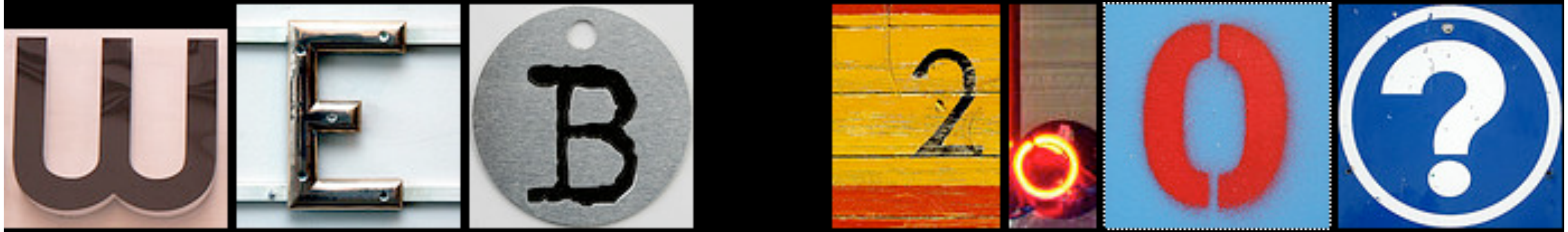
Dave

So, what do you *really* think?
Send feedback about Yahoo! Mail Beta
SEND FEEDBACK

Done

Rich Internet Applications (RIAs)

- RIAs are:
  - Web apps with features and functionality of traditional desktop applications
  - Can be created in various languages: Flash, JavaScript, Java
    - Today’s talk is focused on JavaScript RIAs



Web 2.0 Design Philosophy

- **“Getting It Right The Second Time” -** Matt Sweeney
- http://yuiblog.com/blog/2006/10/03/video-sweeney-hackday06/

Getting It Right the Second Time

- Use technology as designed
  - Example: HTML is a small vocabulary, so choose the right tags to give the most meaning to your content.
- Do not corrupt layers of the stack
  - Examples of what not to do:
    - `class="red-button"`
    - `href="javascript:"`
- Create platforms. Evolvability
  - Encapsulation, Flexibility, Mashups, Services, Portability
- **Preserve opportunity & availability**

Preserve opportunity & availability

Accessibility Defined

- Accessibility is:
  - “A general term used to describe the degree to which a system is usable by as many people as possible without modification” (cite: Wikipedia)
- Often, our focus is on enabling screen-readers specifically
  - However, the resulting work is generally more far-reaching

So how can we move forward?

Three Techniques (Use Them All)

1. Standards-based Development
2. Redundant Interfaces
3. Faithful and Predictable Ports

Characteristics of Techniques

- Don’t make things worse
- Provide alternatives
- Learn from other technologies
- Support improvement of a11y tech

Standards-Based Development

Don’t miss the opportunity

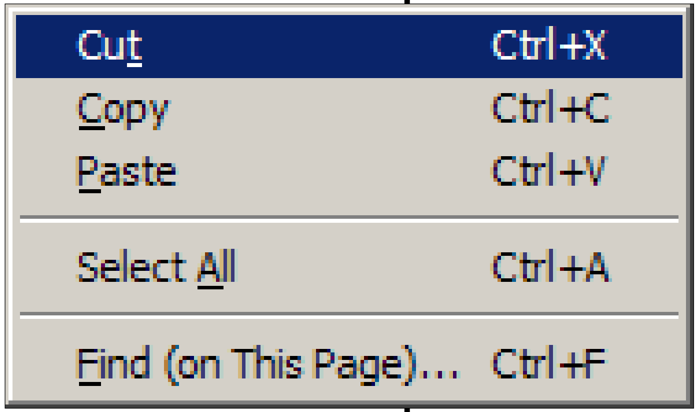
Approach 1: Standards-Based Development

- Overview and Definition
  - Create and stand upon a strong markup foundation
  - Subsequent layers (CSS, JavaScript, etc.) enhance meaningful and structured markup
  - Progressive and unobtrusive enhancement
  - Don’t contaminate the neighborhood
  - Be generous with markup to provide as much meaning as possible

Standards-Based Development

Example: Menu Structure

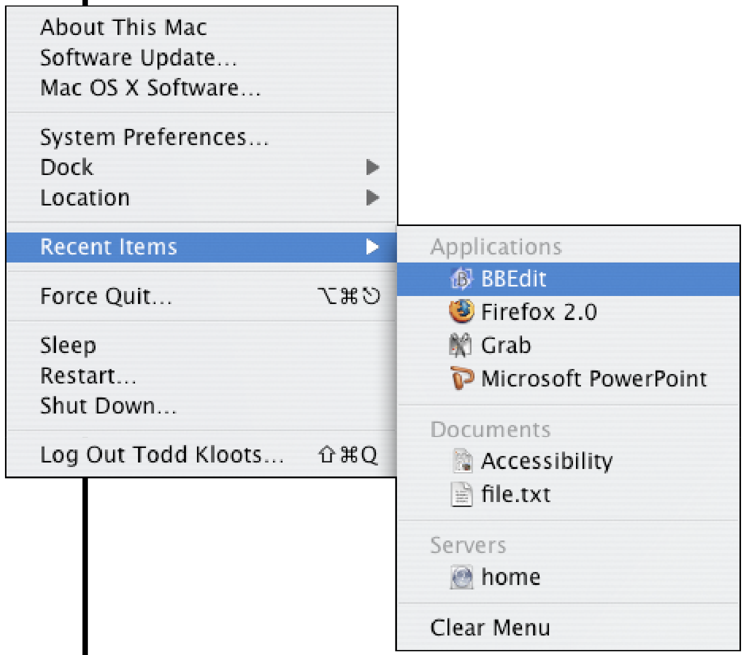
```
<div>
    <div>

        <ul>
            <li> Cut </li>
            <li> Copy </li>
            <li> Paste </li>
        </ul>

        <ul>
            <li> Select All </li>
        </ul>

        <ul>
            <li> Find (on This Page)... </li>
        </ul>

    </div>
</div>
```



Standards-Based Development

Example: Menu Heirarchy

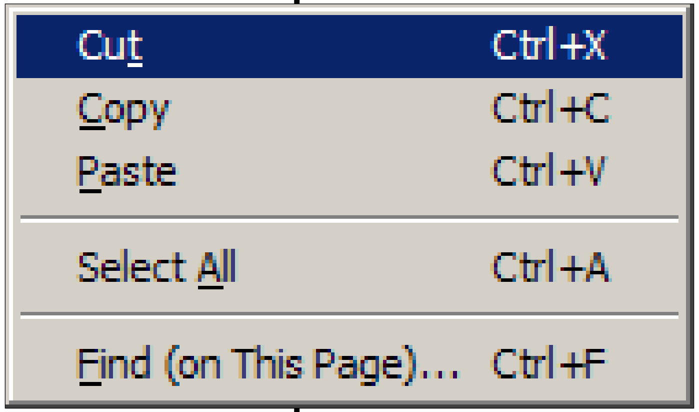
```
<div>
    <div>

        <ul>
            <li> Item One

                <div>
                    <div>

                        <ul>
                            <li> Item One </li>
                            <li> Item Two </li>
                            <li> Item Three </li>
                        </ul>

                    </div>
                </div>

            </li>
            <li> Item Two </li>
            <li> Item Three </li>
        </ul>

    </div>
</div>
```



Standards-Based Development

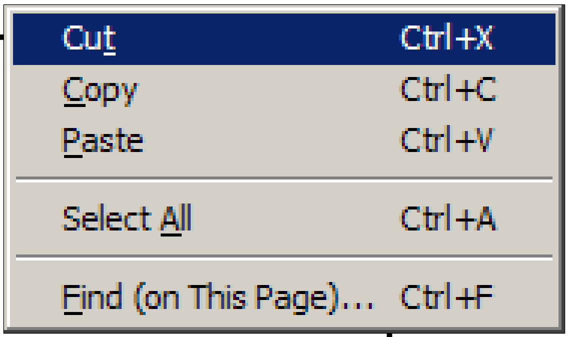
Example: Separators

```
<div>
    <div>

        <ul>
            <li> Cut </li>
            <li> Copy </li>
            <li> Paste </li>
        </ul>

        <ul>
            <li> Select All </li>
        </ul>

        <ul>
            <li> Find (on This Page)... </li>
        </ul>

    </div>
</div>
```



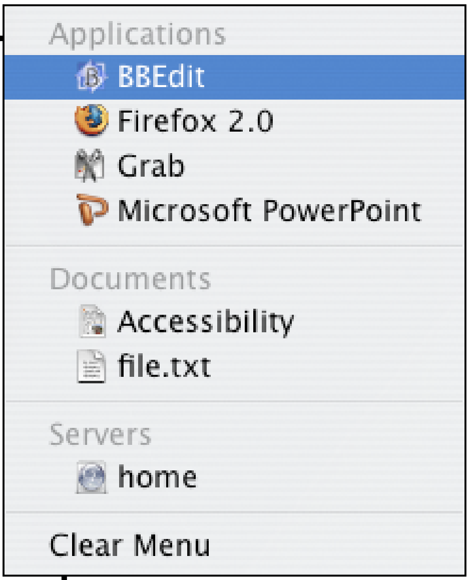
Standards-Based Development
Example: Help Text

```
<div>
    <div>

        <ul>
            <li> Cut <em>Ctrl + X</em> </li>
            <li> Copy <em>Ctrl + C</em> </li>
            <li> Paste <em>Ctrl + V</em> </li>
        </ul>

        <ul>
            <li> Select All <em>Ctrl + A</em> </li>
        </ul>

        <ul>
            <li> Find (on This Page)... <em>Ctrl + F</em> </li>
        </ul>

    </div>
</div>
```



Standards-Based Development
Example: Titles

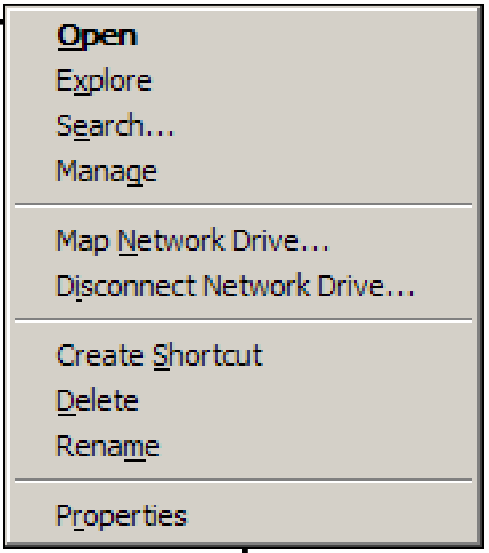
```
<div>
    <div>

        <h6> Applications </h6>
        <ul>
            <li> BBEdit </li>
            <li> Firefox 2.0 </li>
            <li> Grab </li>
            <li> Microsoft PowerPoint </li>
        </ul>

        <h6> Documents </h6>
        <ul>
            <li> Accessibility </li>
            <li> file.txt </li>
        </ul>

    </div>
</div>
```



Standards-Based Development

Example: Emphasis

```
<div>
    <div>

        <ul>
            <li> <em>Open</em> </li>
            <li> Explore </li>
            <li> Search… </li>
            <li> Manage </li>
        </ul>

        <ul>
           <li> Map Network Drive.. </li>
           <li> Disconnect Network Drive.. </li>
        </ul>

        ...

    </div>
</div>
```



Standards-Based Development

Benefits

- “With the grain” of web technologies
- Truly available to all
- Provides strong foundation
- A step toward a semantic web
- Long shelf life

Standards-Based Development
Drawbacks

- Doesn’t solve every problem
- *Perceived* overhead
  - Unobtrusive JavaScript, CSS-based layouts and Hijax are still less familiar techniques

Standards-Based Development
Drawbacks Example

- “disabled” attribute can be applied to a limited number of elements in HTML 4:
  - `<button>`
  - `<input>`
  - `<optgroup>`
  - `<select>`
  - `<textarea>`
- This limitation makes it difficult to communicate that an element in a DHTML widget is disabled
- Existing limitation solved by WAI-ARIA States and Properties
  - Example: `<li role=“wairole:menuitem” aaa:disabled="true">Copy</li>`

Redundant Interfaces

Offer flexible interactions

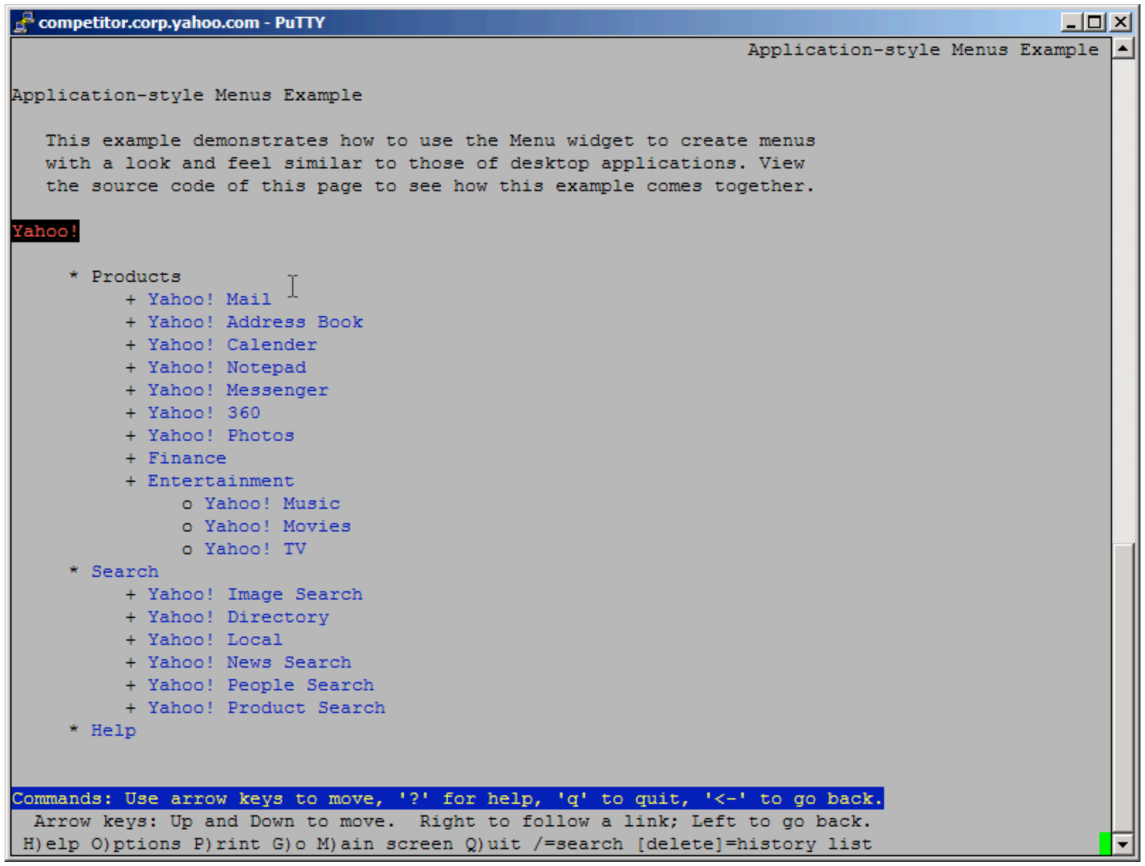
Approach 2: Redundant Interfaces

- Overview and Definition
  - Desktop offers multiple means of *input*
    - Choice of GUI input and command line
    - Direct movement of objects vs. configuration-based movement
    - Text fields with option of auto complete
    - Support for Tab and arrow keys
- *We must bring these redundancies to the web*

Approach 2: Redundant Interfaces

- Overview and Definition
  - Desktop offers multiple means of *manipulation*
    - Keyboard and mouse
      - Example: Users can close a window by hitting "Esc" key or by using the close button
    - Drag-drop and form-based
- *We must bring these redundancies to the web*

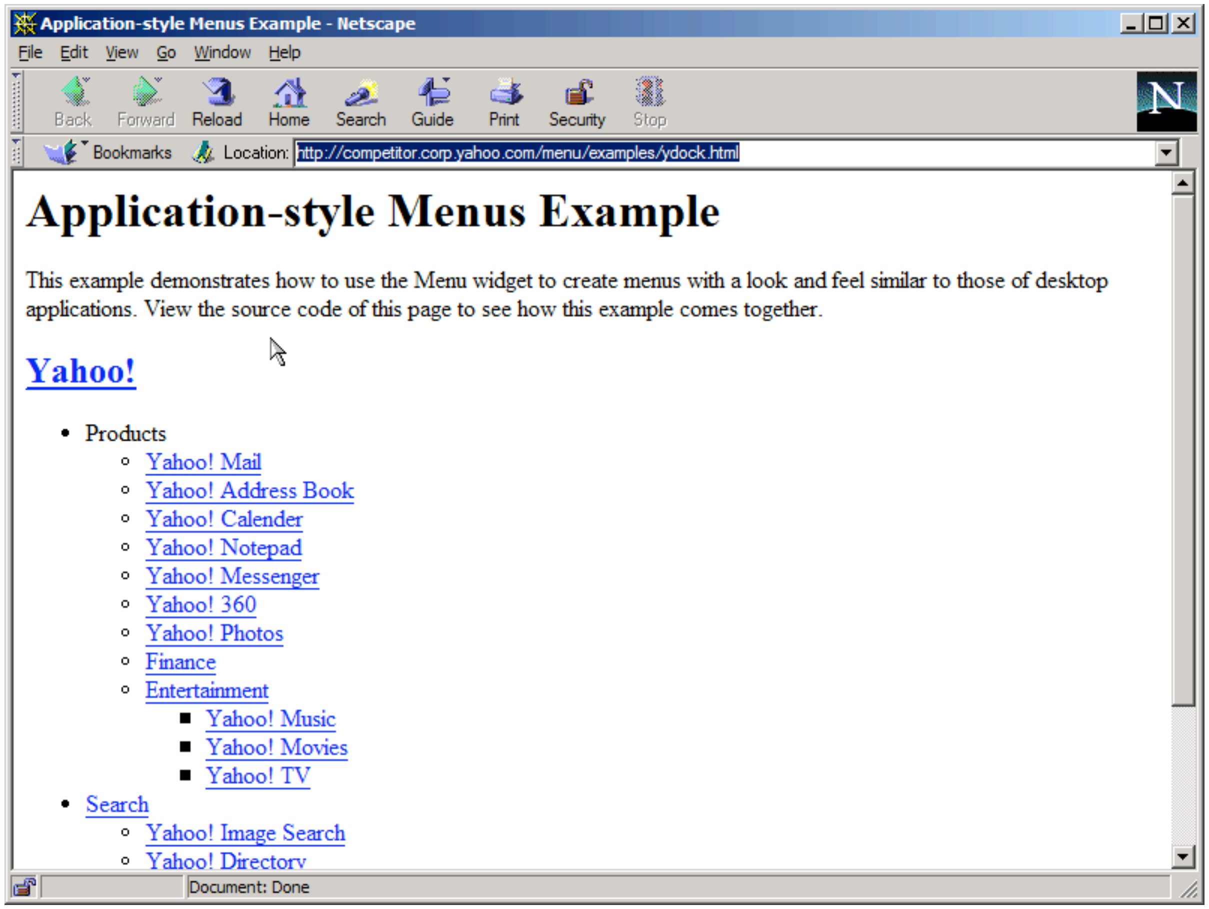
Redundant Interfaces
Example: Progressive Enhancement


competitor.corp.yahoo.com - PuTTY

```
                                              Application-style Menus Example

Application-style Menus Example

   This example demonstrates how to use the Menu widget to create menus
   with a look and feel similar to those of desktop applications. View
   the source code of this page to see how this example comes together.

Yahoo!

     * Products
          + Yahoo! Mail
          + Yahoo! Address Book
          + Yahoo! Calender
          + Yahoo! Notepad
          + Yahoo! Messenger
          + Yahoo! 360
          + Yahoo! Photos
          + Finance
          + Entertainment
               o Yahoo! Music
               o Yahoo! Movies
               o Yahoo! TV
     * Search
          + Yahoo! Image Search
          + Yahoo! Directory
          + Yahoo! Local
          + Yahoo! News Search
          + Yahoo! People Search
          + Yahoo! Product Search
     * Help

Commands: Use arrow keys to move, '?' for help, 'q' to quit, '<-' to go back.
  Arrow keys: Up and Down to move.  Right to follow a link; Left to go back.
 H)elp O)ptions P)rint G)o M)ain screen Q)uit /=search [delete]=history list
```

- **Lynx**: text-only browser
- No JavaScript support
- No CSS support
- YUI Menu content is still meaningful and menu hierarchy is well represented because it is based on semantic markup

Redundant Interfaces
Example: Progressive Enhancement


Application-style Menus Example - Netscape
File Edit View Go Window Help
Back Forward Reload Home Search Guide Print Security Stop
Bookmarks Location: http://competitor.corp.yahoo.com/menu/examples/ydock.html
Document: Done

Application-style Menus Example

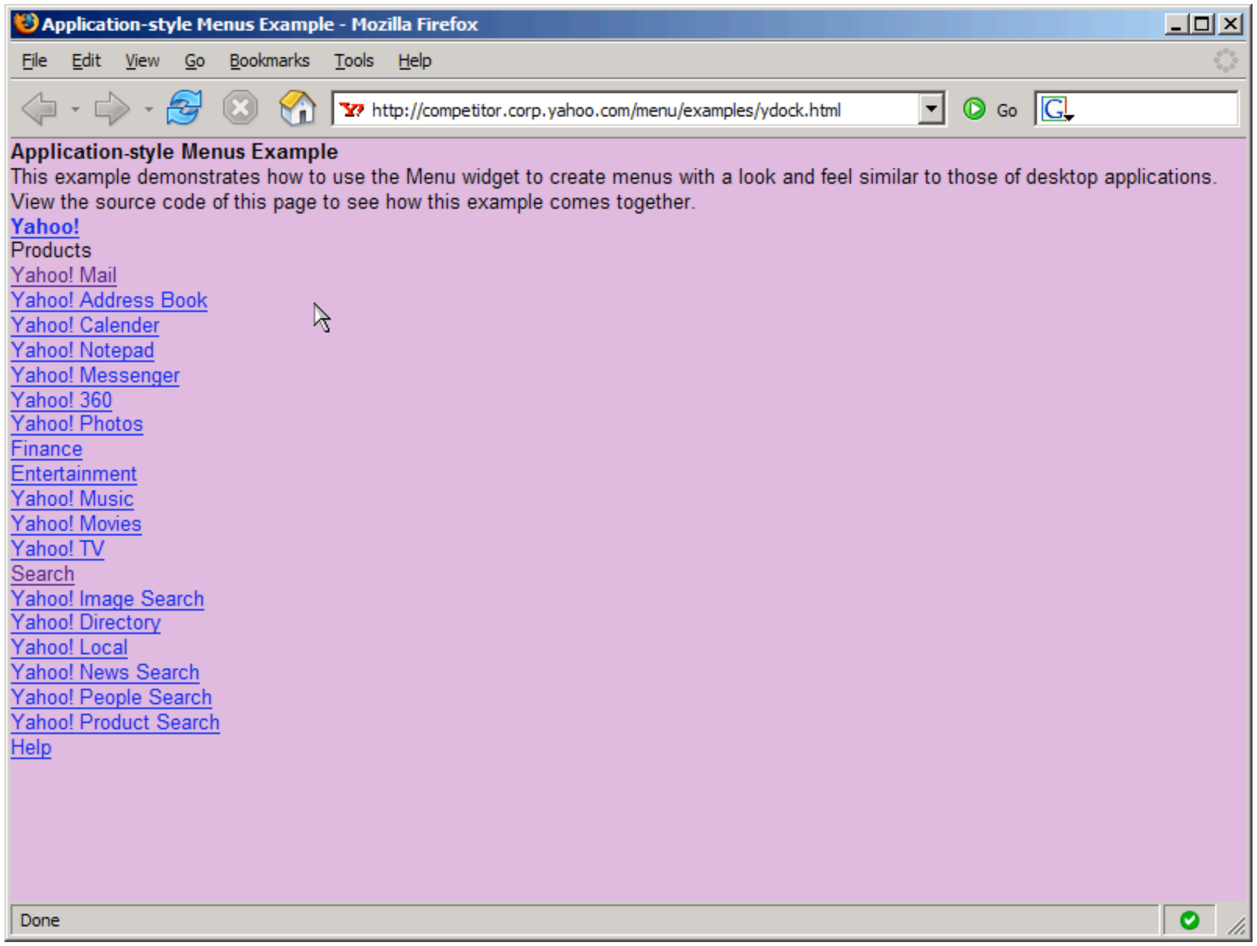
This example demonstrates how to use the Menu widget to create menus with a look and feel similar to those of desktop applications. View the source code of this page to see how this example comes together.

Yahoo!

- Products
  - Yahoo! Mail
  - Yahoo! Address Book
  - Yahoo! Calender
  - Yahoo! Notepad
  - Yahoo! Messenger
  - Yahoo! 360
  - Yahoo! Photos
  - Finance
  - Entertainment
    - Yahoo! Music
    - Yahoo! Movies
    - Yahoo! TV
- Search
  - Yahoo! Image Search
  - Yahoo! Directory

- **Netscape 4:** graphical browser with limited support for CSS and JavaScript
- YUI Menu content is still meaningful and menu hierarchy is well represented because it is based on semantic markup.

Redundant Interfaces
Example: Progressive Enhancement

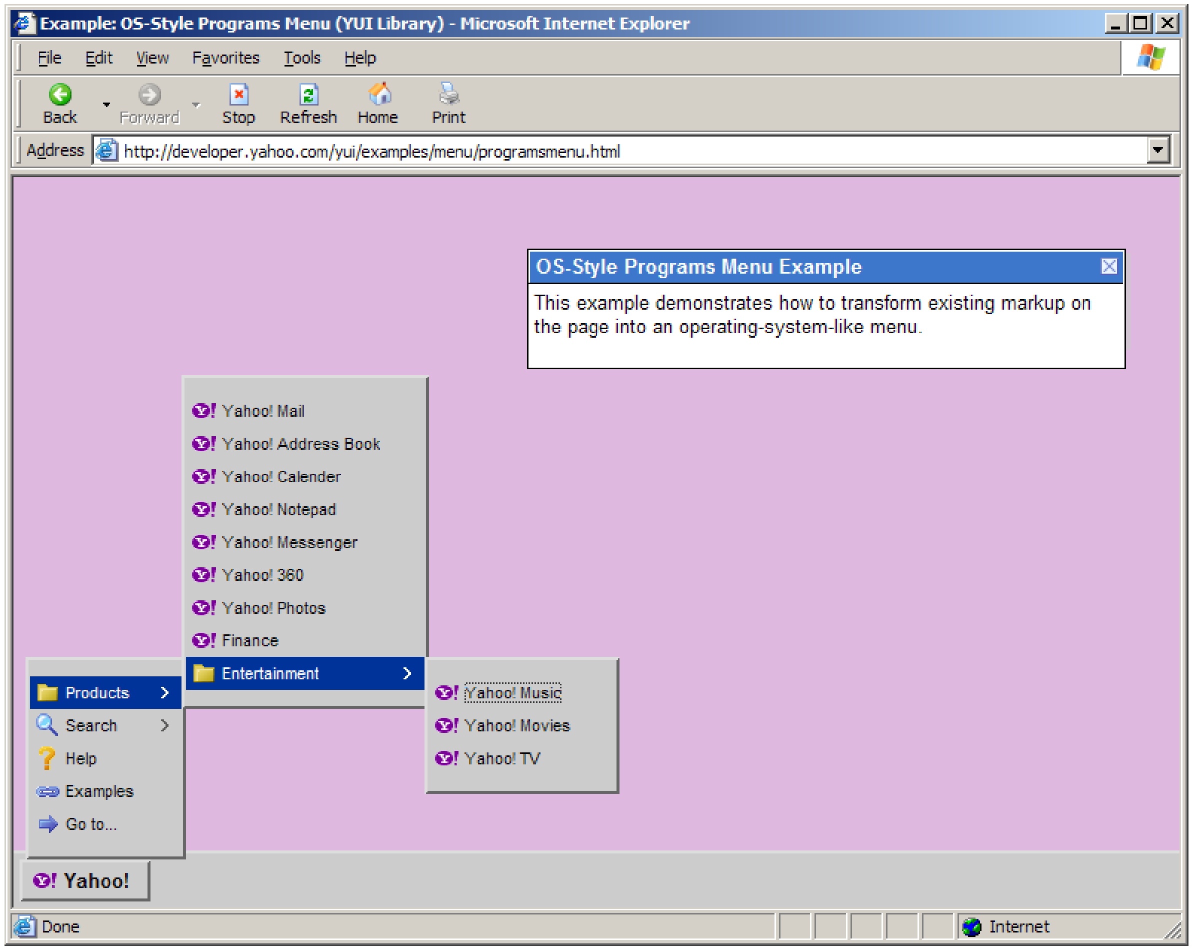

Application-style Menus Example - Mozilla Firefox
File Edit View Go Bookmarks Tools Help
http://competitor.corp.yahoo.com/menu/examples/ydock.html
Go

Application-style Menus Example
This example demonstrates how to use the Menu widget to create menus with a look and feel similar to those of desktop applications.
View the source code of this page to see how this example comes together.
Yahoo!
Products
Yahoo! Mail
Yahoo! Address Book
Yahoo! Calender
Yahoo! Notepad
Yahoo! Messenger
Yahoo! 360
Yahoo! Photos
Finance
Entertainment
Yahoo! Music
Yahoo! Movies
Yahoo! TV
Search
Yahoo! Image Search
Yahoo! Directory
Yahoo! Local
Yahoo! News Search
Yahoo! People Search
Yahoo! Product Search
Help

Done

- Firefox has excellent support for CSS and JavaScript
- Paranoid users might disable JavaScript
- YUI Menu content is still meaningful and menu hierarchy is well represented because it is based on semantic markup

Redundant Interfaces
Example: Progressive Enhancement



Example: OS-Style Programs Menu (YUI Library) - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Forward Stop Refresh Home Print
Address http://developer.yahoo.com/yui/examples/menu/programsmenu.html
Yahoo! Mail
Yahoo! Address Book
Yahoo! Calender
Yahoo! Notepad
Yahoo! Messenger
Yahoo! 360
Yahoo! Photos
Finance
Entertainment
Products
Search
Help
Examples
Go to...
Yahoo! Music
Yahoo! Movies
Yahoo! TV
Yahoo!
Done
Internet

OS-Style Programs Menu Example

This example demonstrates how to transform existing markup on the page into an operating-system-like menu.

- **IE** also has excellent support for CSS and JavaScript
- CSS and JavaScript can work together to transform the experience without sacrificing the content

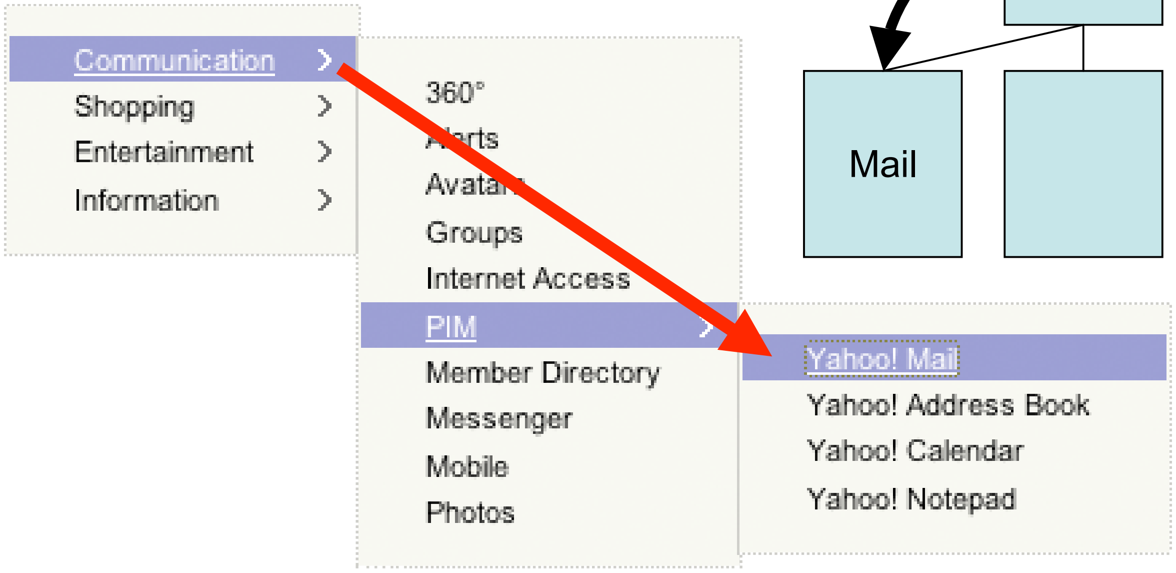
Progressive Enhancement Summary

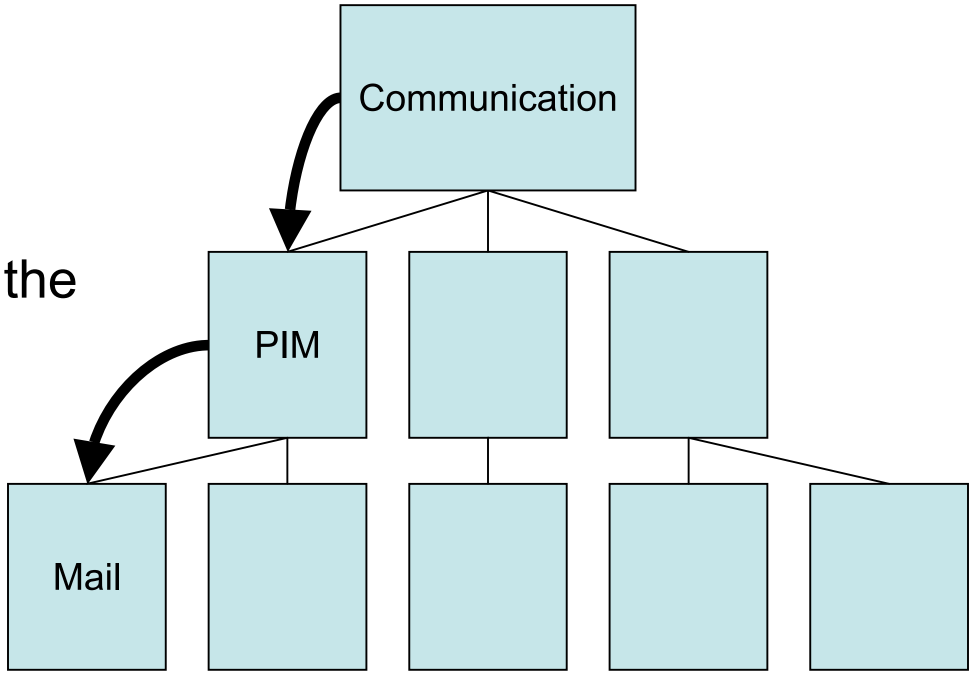
- Semantic markup makes content portable
- Progressive enhancement allow for the development of redundant interfaces that give users a choice
  - Text only interface: Lynx and Netscape 4
  - Rich, DHTML interface: Firefox and IE

Redundant Interfaces

Example: Multiple Task Flows

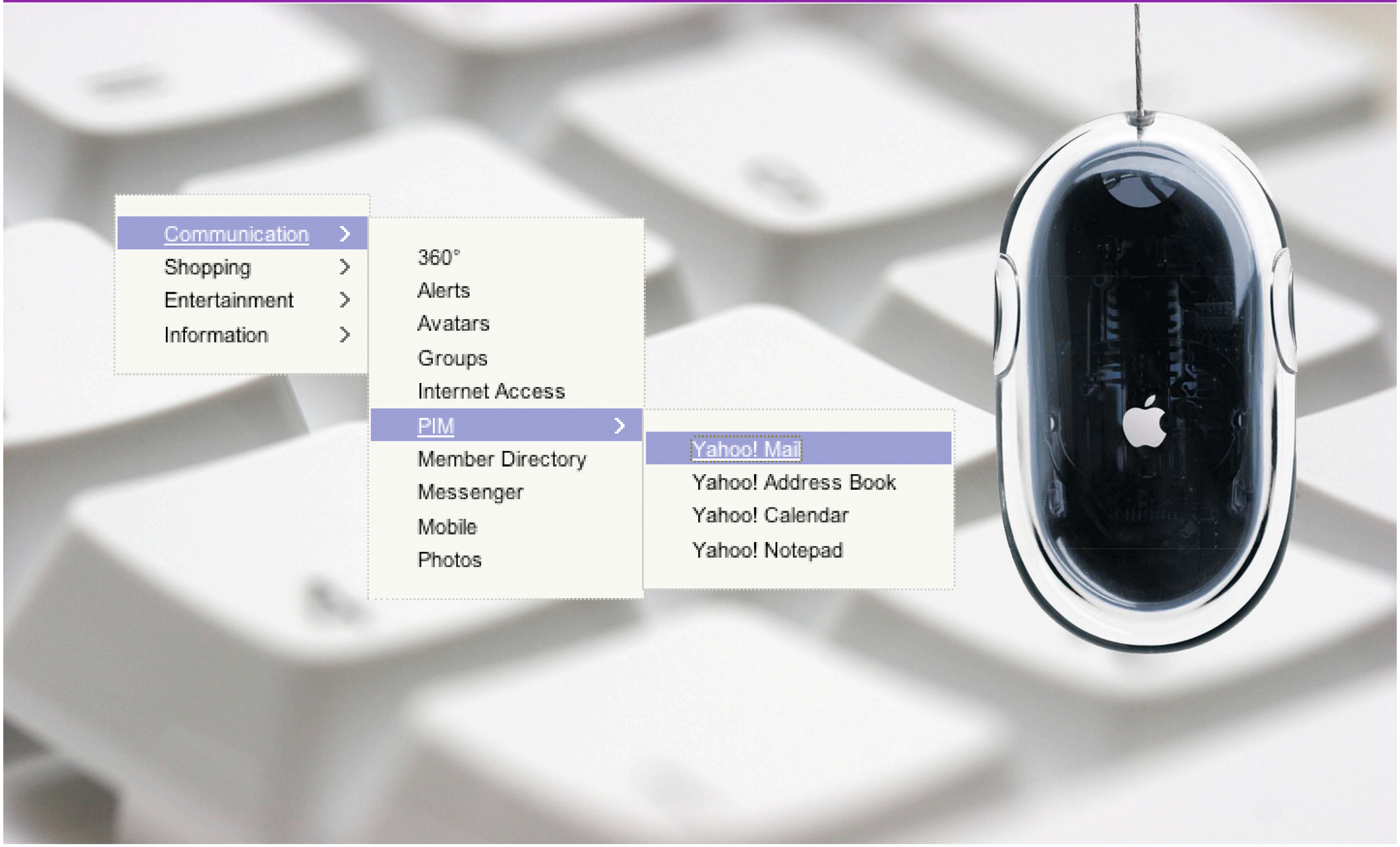
- Site should be to be navigated without DHTML
- Give users a choice
- DHTML menus gives the user the option of skipping steps





Redundant Interfaces

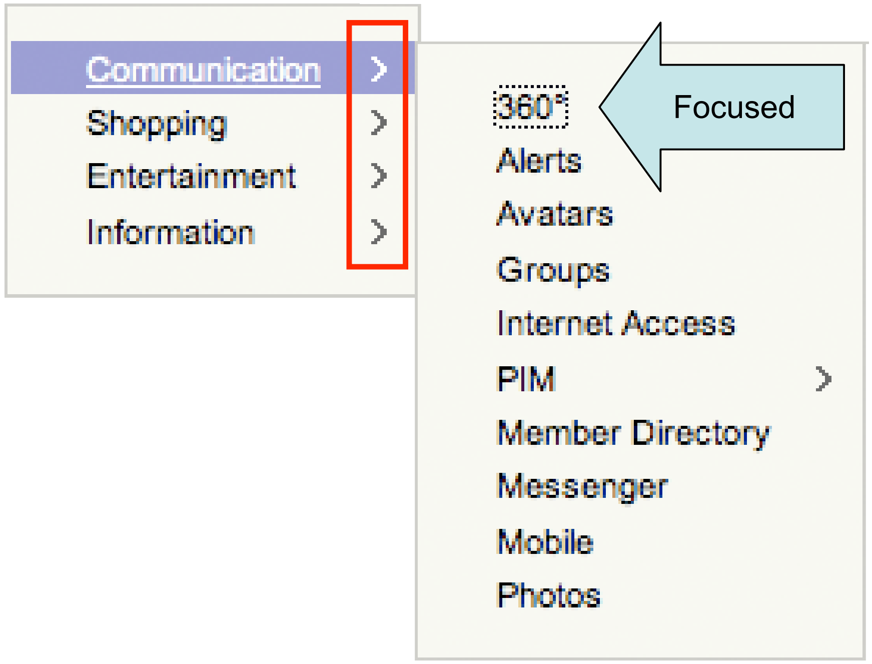
Example: Keyboard & Mouse Support



Keyboard & Mouse Support
Roaming tabindex=“0” technique

- Start out with tabindex=“-1” on all child items except for first, which gets tabindex=“0”
- As user arrows around, reset previously focused item item to tabindex=“-1”
- Set newly focused item to tabindex=“0”
- Works with Firefox and IE
- More at: http://developer.mozilla.org/en/docs/Key-navigable_custom_DHTML_widgets

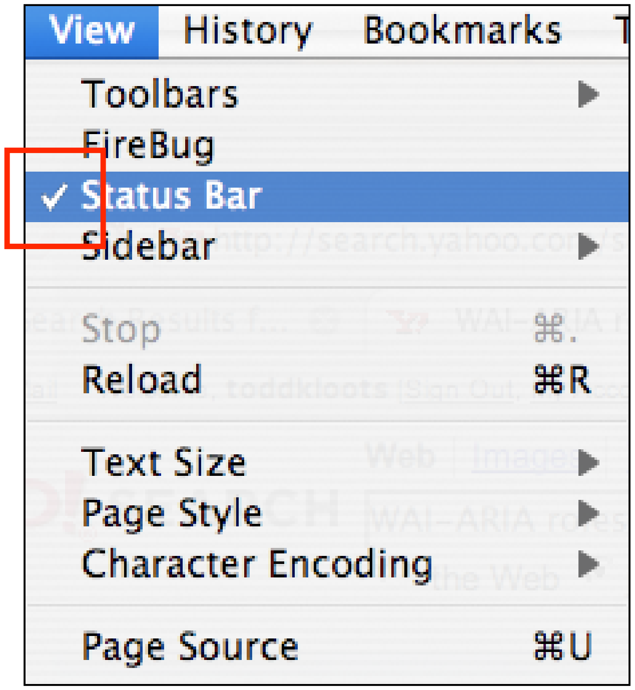
Redundant Interfaces
Example: Screen Reader Support



- Inline images with alt text: "Collapsed. Click to expand."
- "click" event handler hides and shows submenu
- When submenu is made visible, content is focused and image alt text is updated: "Expanded. Click to collapse."

Redundant Interfaces

Example: Screen Reader Support



- Inline image with alt text: “Checked.”
- Appended after the text node of the `<li>` element
- Positioned via CSS for traditional look and feel

```
<li> Status Bar <img alt=“Checked”> </li>
```

Redundant Interfaces

Example: Screen Reader Support

- Learnings:
  - Use inline images over background images when appropriate
  - Screen readers respect CSS “visibility” and “display” properties
  - Set focus to new content that is made visible or appended to the page via DOM methods

Redundant Interfaces

Benefits

- Better for everybody
  - Keyboard is important just as important as mouse
  - Let users choose from multiple task flows
- Transfer the complete set of expectations from the desktop to the browser

Redundant Interfaces

Drawbacks

- Insufficient communication with accessibility APIs on the desktop
- Dual experiences/interfaces may pressure goals of parity
- Requires development of two experiences
  - But not 2x effort!
  - **Can actually <u>benefit</u> development process**

Faithful and Predictable Ports

Preserve the illusion

Approach 3: Faithful and Predictable Ports

- Overview and Definition:
  - Mimic the desktop experience to provide:
    - Learnability
    - Discoverability
  - Completeness is critical
  - We must capture this moment in time

Faithful and Predictable Ports
Example: Keyboard Access

- Hitting Esc hides a menu
- Arrow keys
  - Up and Down will go over the top
  - Right to expand submenu OR to move to the next item in the menu bar
  - Left to collapse a submenu OR to move to the next item in a menu bar
- Tabbing through items

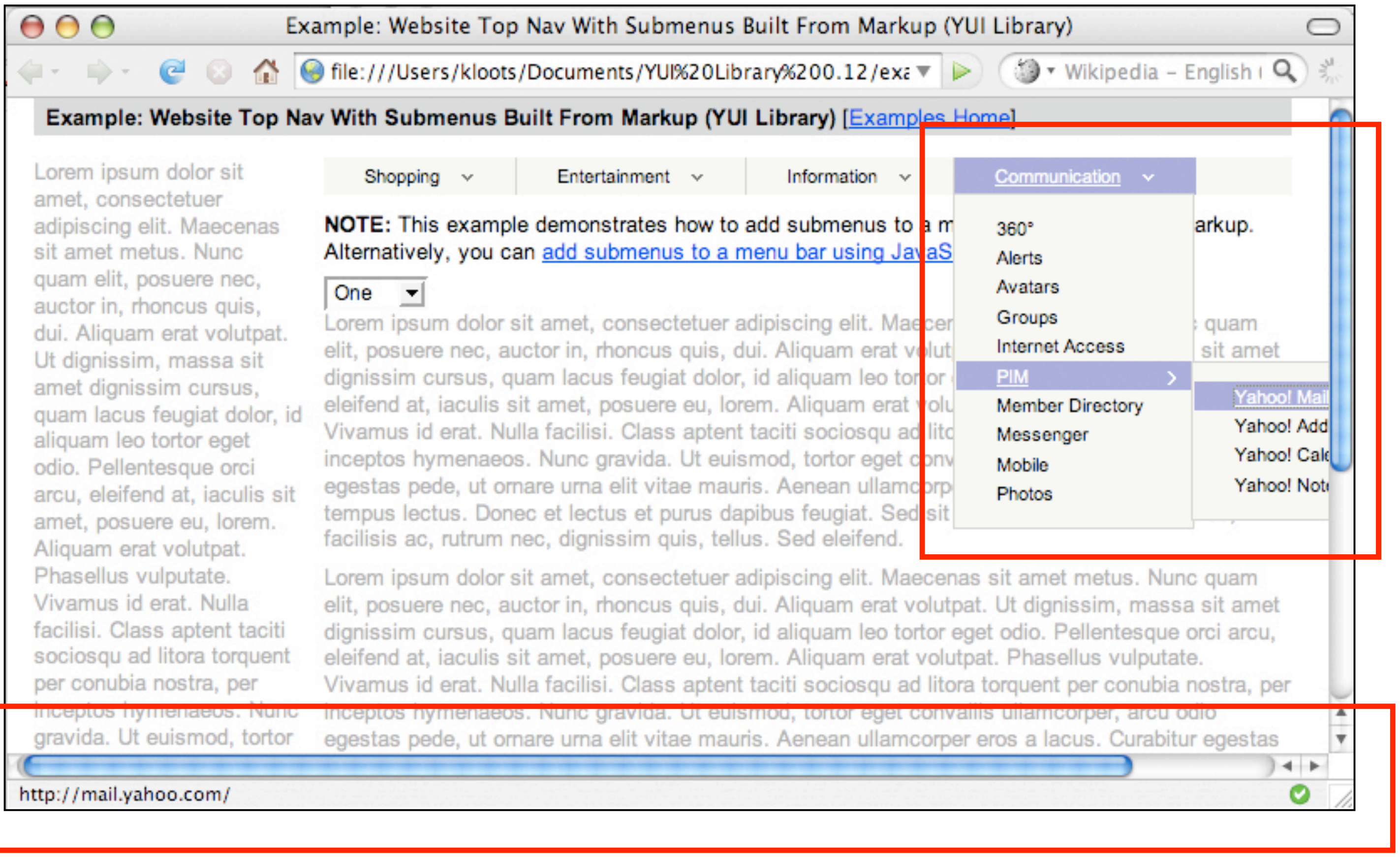
Faithful and Predictable Ports

Example: Resizability

- Declare font size in relative units
- Use `<iframe>` to allow DHTML widgets to response to changes to the font size
  - Create and insert into the page via JavaScript
  - Height and width declared in EM units
  - Add a “resize” event listener

Faithful and Predictable Ports
Example: Viewport Positioning

Problem: Menus positioned outside the boundaries of the browser viewport require extra scrolling.



Example: Website Top Nav With Submenus Built From Markup (YUI Library)

file:///Users/kloots/Documents/YUI%20Library%200.12/exa

Example: Website Top Nav With Submenus Built From Markup (YUI Library) [Examples Home]

NOTE: This example demonstrates how to add submenus to a m … arkup. Alternatively, you can add submenus to a menu bar using JavaS

Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Maecenas sit amet metus. Nunc quam elit, posuere nec, auctor in, rhoncus quis, dui. Aliquam erat volutpat. Ut dignissim, massa sit amet dignissim cursus, quam lacus feugiat dolor, id aliquam leo tortor eget odio. Pellentesque orci arcu, eleifend at, iaculis sit amet, posuere eu, lorem. Aliquam erat volutpat. Phasellus vulputate. Vivamus id erat. Nulla facilisi. Class aptent taciti sociosqu ad litora torquent per conubia nostra, per inceptos hymenaeos. Nunc gravida. Ut euismod, tortor

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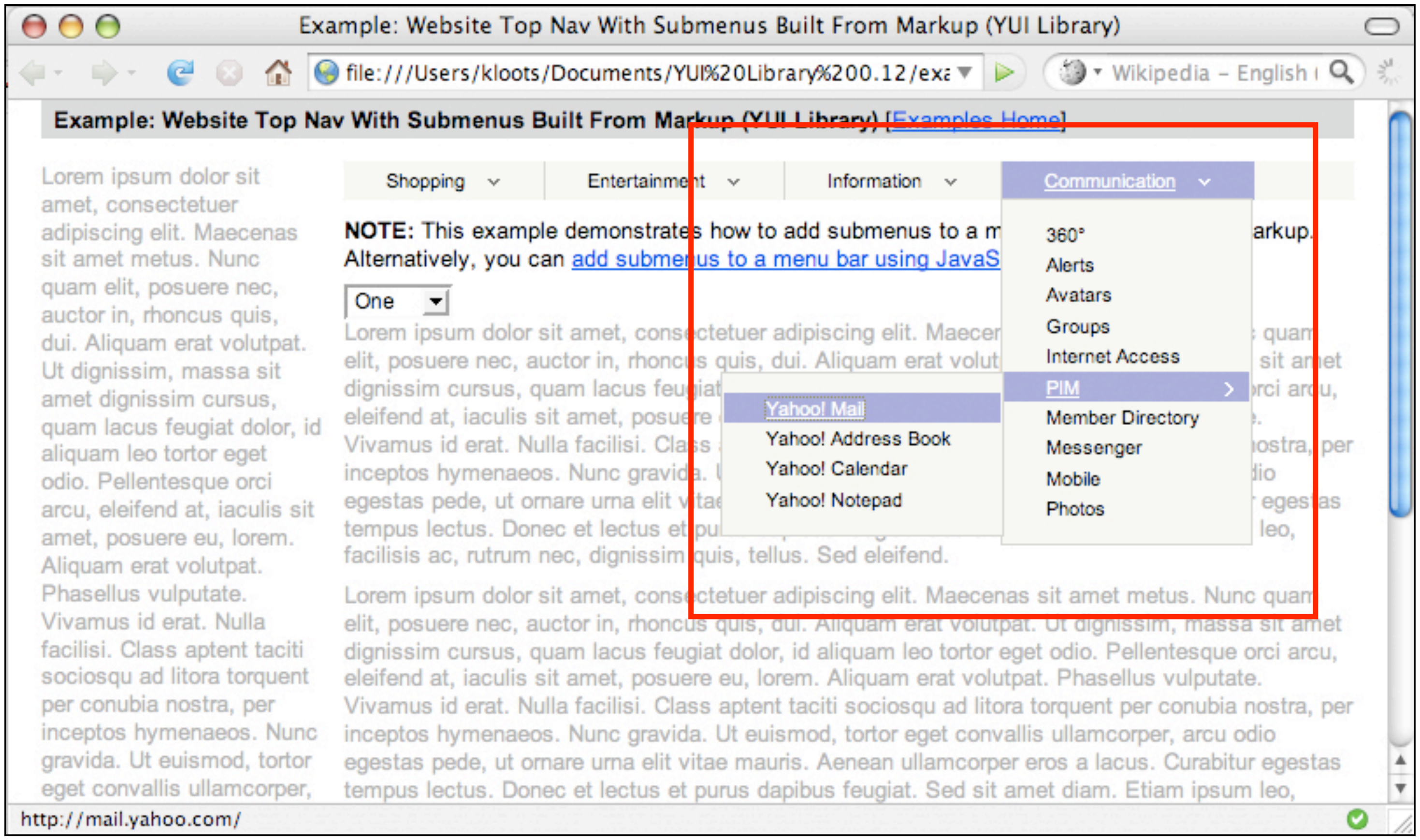
http://mail.yahoo.com/

Faithful and Predictable Ports

Example: Viewport Positioning

Solution: Menus that automatically remain inside the browser viewport boundaries are more usable to all users.



Example: Website Top Nav With Submenus Built From Markup (YUI Library) [Examples Home]

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NOTE: This example demonstrates how to add submenus to a m arkup. Alternatively, you can add submenus to a menu bar using JavaS

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Faithful and Predictable Ports
WAI-ARIA Roles & States

- Utilizes powerful and well-understood desktop API
- Map controls, events, roles and states directly to powerful and well-understood desktop accessibility APIs
- Standard and predictable enrichment of markup
- Allows ARIA on top of RIA

Faithful and Predictable Ports: Benefits

- More options for *everybody*
- Better discoverability
- Better usability
- Supports many working styles
- Establish the new platform

Faithful and Predictable Ports: Drawbacks

- Isn’t always easy
- Seems heavier and/or more complex
- Not always the path of least resistance

Questions