1. What’s a Web Application?

What are the issues and challenges in working with web applications?
What is a web application?

- A web page with a form?
- Any application that runs in a browser?
- Any application that connects over the Internet?
- An application written in [Java | .Net | other languages]?

What's your definition?

Issue 1: Different purposes

Applications...
- Are focused on "doing something"

Web pages...
- Are focused on providing information
Issue 2: Different technical architecture

WinApps...
■ Run on a local computer
   ■ Installed
   ■ Processing power of the local computer manages the user interaction
   ■ Servers are used primarily for data retrieval or storage
   ■ The local computer can remember the session, and the "state" of the interaction

Web apps...
■ Run on a server
   ■ No installation required
   ■ The browser has only limited processing power
   ■ The program resides on the server, so most interaction requires a trip to the server
   ■ The local computer has no record of the session, so the server must maintain the "state"

Issue 3: Different building blocks

WinApps ...
■ Have a rich set of controls:
   ■ There are many different types of controls

Web apps ...
■ Have a limited set of controls
   ■ Basic forms controls are limited to radio buttons, check boxes, input fields, lists and tables
   ■ Each software tool has a different set of controls available
### Issue 4: Different interaction styles

**WinApps ...**
- Allow flexible interaction
  - The interface allows direct manipulation - drag and drop, 'right mouse' menus,
  - The screen can dynamically respond to context or user interactions

**Web apps ...**
- Allow limited interaction
  - Standard controls only allow single click interaction
  - Only minimal dynamic response is available

### Issue 5: Where do we put the help?

**WinApps...**
- Mature documentation tools (relatively)
  - Online help (but...do we use HTML Help?)
  - Documentation (but...does anyone read printed manuals now?)
  - Web-based (but...will they use a knowledge base)

**Web apps...**
- A mix of tools and approaches
  - How do we do context-sensitive help in a web application?
  - Where is the boundary between help and the app?
How can we make this a positive change?

- Better control over fonts and colors
- Better integration of graphics
- Better ability to mix information with action
- A chance to rethink...just a little bit.

Lots of opportunities!

Are our current applications really so easy to use?

2. The design vocabulary

How do we use different design elements to meet user needs?
Design elements serve different purposes

- **Navigation**
- **Forms controls**
- **Data display**
- **Information**

**Design elements for navigation**

- **Links and buttons**
- **Tabs**
- **Lists and expanding lists (cascading menus)**
- **Drop-downs**
- **Tables**
Links and buttons

Links are for navigation
■ “Show me more information”
■ Strengths
  ■ Allow more words to be used
  ■ Visually lightweight
  ■ Can point to specific data

Buttons are for actions
■ “Do something” - calculate, apply, refresh
■ Strengths
  ■ Visually distinctive
  ■ Can include graphic elements

Tabs divide content into groups
■ Tabs are a convenient way to divide content into more than one page for display.
■ Tabs are now a “standard” web navigation metaphor.
Drop-downs can be navigation tools

- They collapse choices into a small area on the screen.

But...
- Choices are not visible.
- You lose information design opportunities.
- They add to the “work” of using an application.

Read about these fund types:
- Money Market
- Short Term Bond
- Intermediate Bond
- Long Term Bond
- Balanced
- General Stock
- More Aggressive Stock
- Industry-Specific Stock
- International Stock

Get quotes and charts
Name [ ] Quotes ▼ Go

Tables: navigation, data displays or both

Open Invoices
As of March 9, 2003

<table>
<thead>
<tr>
<th>Type</th>
<th>Date</th>
<th>Num</th>
<th>Due Date</th>
</tr>
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<tbody>
<tr>
<td>Stream Government Solutions, Inc.</td>
<td>533</td>
<td>12/5/2001</td>
<td></td>
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<tr>
<td>Invoice</td>
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<td>Invoice</td>
<td>01/06/2001</td>
<td>5332-2</td>
<td>12/5/2001</td>
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</tbody>
</table>

Total eStream Government Solutions, Inc. | 533

VMGUARD FUNDS
Price as of 03/03/2003, YTD Returns as of 03/03/2003

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<thead>
<tr>
<th>Name</th>
<th>Symbol</th>
<th>Yield</th>
<th>Price</th>
<th>Change</th>
<th>YTD Return</th>
<th>Buy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Null Index Fund Index</td>
<td>VRNX</td>
<td>1.75%</td>
<td>$76.72</td>
<td>0.03%</td>
<td>-5.48%</td>
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</tr>
<tr>
<td>STAG Fund</td>
<td>VOSTX</td>
<td>2.99%</td>
<td>$13.93</td>
<td>0.05%</td>
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</tr>
<tr>
<td>Total Stock Mid Index</td>
<td>VTMX</td>
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<td>2.57%</td>
<td>$19.77</td>
<td>0.15%</td>
<td>-4.66%</td>
<td>Buy</td>
</tr>
</tbody>
</table>
Forms controls

<table>
<thead>
<tr>
<th>Form element</th>
<th>How users expect it to work</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The drop-down box</td>
<td>View default choice. If not acceptable, - click an down-arrow to show choices - scroll through list if necessary - click on one option to select it. One of the options could be blank.</td>
</tr>
<tr>
<td>2. Radio buttons</td>
<td>View default choice. If not acceptable, click on another option to select it. Expect to select one option.</td>
</tr>
<tr>
<td>3. Check boxes</td>
<td>Click on all acceptable choices. Can leave all the boxes blank if none are acceptable.</td>
</tr>
<tr>
<td>4. The type-in box</td>
<td>Type in a response or leave the box blank.</td>
</tr>
<tr>
<td>5. Hyperlinks</td>
<td>Click on one link to see a new page.</td>
</tr>
</tbody>
</table>


Choosing drop-downs and radio buttons

- **Drop-downs**
  - Only final choice is shown
  - Handles longer list of items
  - More effort required to use it

- **Radio buttons**
  - All choices are visible
  - But...harder to see which one is selected
  - Good for short lists
  - Single action required to use it
Using radio buttons and check boxes

- Both radio buttons and check boxes are good ways to show all of the alternatives on the screen.
- Longer explanations can be included with the options.
- Not all users understand the difference between a radio button and a check box.

Good information design for tables

- Alternate row colors help separate long rows of data.
- Horizontal lines help the eye track from left to right.
- Color, bolding, or other visual devices help make critical information jump out of the page.
And, the words

- Labels
- Prompts
- Informational text
- Instructional text
- Content text

3. Designing for Use

What do we need to consider to understand the new context of a web application?
What do we know about the use...?

How often is the application used?
- Only occasionally and briefly
- Daily, for long sessions

How much domain knowledge is needed?
- General knowledge only
- Some domain knowledge
- Detailed specialist knowledge

...and the application context?

What is the primary interaction in the application?
- Information search and retrieval
- Viewing data with some interaction
- Actions, entry or other interaction

Does this application include?
- (Apparently) simple tasks
- A mix
- Complex or multi-step tasks

Does this application include?
- Simple information, easily displayed on a screen
- A mix
- Large or complex data sets
Different aspects of user expectations

- Relationship between user and application
- Style and tone of the conversation
- Presentation style
- Interaction style
- Expectations for interface standards
- Frequency of use
- Perceived distance

This concept was developed with Susan Fowler at UsabilityNJ workshop in 2002, and presented at a session at UPA2002

Relationship between user and application

- No ongoing relationship.
- No log in.
  - Calculator
- Prior history.
  - Remembers me.
- Mission critical work
  - E-commerce
  - Online banking

- Is this app required for users?
- Do users have to identify themselves?
- Does the app remember prior work?
- Is there an need for reliability?
**Interaction style**

- **Text Information and Links**
  - Online auction

- **Simple Data Collection**
  - Consumer mortgage application

- **Data Presentation and Complex Controls**
  - Network monitoring and management

- How do users interact with the application?
- What is the basic paradigm of the interaction?

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**Style of conversation**

- **Informal or Casual**
  - Self promotion

- **Polite but Friendly**
  - Build-your-own shopping app

- **Formal**
  - Security screener

- What is the relationship between the application owner and users?
- What kind of language and terminology is used?
Presentation style

- Fun, Cool, Graphic
- Informational, but Attractive
- Subdued, Serious

- What is the graphic style of the user interface?
- How closely related is the presentation style to the application content?

Expectation for interface standards

- Consistency within the site/app
  - Game
- Strong PC or Mac platform standards
  - Online Banking

- Does this application replace or supplement a desktop application?
- Is it used with other apps that set expectations?
- Is it used exclusively in a business setting?
Frequency of use

- **Occasional, Erratic**
  - Foreign exchange tool

- **Episodic, Periodic**
  - Self-registration for medical appts

- **Constant, Daily**
  - Customer service desktop

- How often is this app used?
- For how long is it used at one time?
- What triggers its use?

Perceived distance

- **Far Away**
  - Server
  - Panama Canal-cam

- **Can’t Tell or Don’t Care**
  - Quicken updates

- **Nearby, On-site or Local**
  - Corporate calendar

- Where do users think this application ‘lives’?
- Who do they think controls the data?
- How readily do they expect to access the data?
### Different kinds of web applications

<table>
<thead>
<tr>
<th>Reports-Oriented Work</th>
<th>Work ‘Desktops’</th>
</tr>
</thead>
<tbody>
<tr>
<td>Looking</td>
<td>Doing</td>
</tr>
<tr>
<td><strong>RELATIONSHIP</strong></td>
<td></td>
</tr>
<tr>
<td>User Selects App</td>
<td>App Selects User</td>
</tr>
<tr>
<td><strong>INTENSITY OF INTERACTION</strong></td>
<td></td>
</tr>
<tr>
<td>• information presentation</td>
<td>• embodies an entire task</td>
</tr>
<tr>
<td>• data manipulation</td>
<td>• often mission critical</td>
</tr>
<tr>
<td>• actions often separate</td>
<td>• long sessions</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>E-Commerce</th>
<th>Home Applications</th>
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<tbody>
<tr>
<td>Looking</td>
<td>Doing</td>
</tr>
<tr>
<td>• browsing-focused</td>
<td>• targeted task</td>
</tr>
<tr>
<td>• casual until purchase</td>
<td>• simple interaction style</td>
</tr>
<tr>
<td>• stored information convenient, not critical</td>
<td>• persistent data</td>
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<tr>
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### Examples

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<td></td>
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<tr>
<td>• Physician access to test reports</td>
<td>• Mortgage broker app</td>
</tr>
<tr>
<td>• Market report</td>
<td>• Network surveillance tool</td>
</tr>
<tr>
<td>• Web article with comments</td>
<td>• Hospital management program</td>
</tr>
<tr>
<td>• E-Commerce site</td>
<td>• Online auction</td>
</tr>
<tr>
<td>• Personal beauty planner</td>
<td>• Finance rate calculator</td>
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<td>• Grocery shopping list</td>
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Reports-Oriented Work

- Test and links
- Polite or formal
- Informative
- Internal only
- Occasional, erratic
- Don’t Know

E-Commerce

Relationship
User and App

Interaction Style

Style of Conversation

Style of Presentation

Expectations for Standards

Frequency of Use

Perceived Distance

Mission Critical Work

Complex Controls

Formal

Subdued, Serious

Strong standards

Constant, Daily

Nearby, Local Server

Simple controls

Informal, casual

Fun, graphic

Internal only

Occasional, erratic

Distant server

No Relationship

Text and Links

Complex Controls

Polite but Friendly

Formal

Informative but Attractive

Subdued, Serious

Internal Consistency

Strong PC/Mac standards

Occasional/Erratic

Episodic, Periodic

Constant, Daily

Far Away Server

Can’t Tell

Nearby, Local Server
Example: Mortgage Broker App

*Used to process applications for mortgages*

- **Relationship User and App**: Mission Critical Work
- **Interaction Style**: Complex Controls
- **Style of Conversation**: Formal
- **Style of Presentation**: Subdued, Serious
- **Expectations for Standards**: Strong standards
- **Frequency of Use**: Constant, Daily
- **Perceived Distance**: Nearby, Local Server

Example: Online Personal Banking

*Used to monitor checking account, pay bills, transfer funds*

- **Relationship User and App**: Mission Critical Work
- **Interaction Style**: Mix
- **Style of Conversation**: Formal
- **Style of Presentation**: Subdued, Serious
- **Expectations for Standards**: Strong standards
- **Frequency of Use**: Episodic, Periodic
- **Perceived Distance**: Don’t Know
Example: Custom Beauty Program

*Used to create a custom mix of beauty products*

- **Relationship User and App:** No previous relationship
- **Interaction Style:** Simple controls
- **Style of Conversation:** Informal, casual
- **Style of Presentation:** Fun, graphic
- **Expectations for Standards:** Internal only
- **Frequency of Use:** Occasional, erratic
- **Perceived Distance:** Don’t Know

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- **Custom Beauty Program**
  - Used to create a custom mix of beauty products

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