



INTERNET & WEB
APPLICATION DEVELOPMENT
SWE 444

Fall Semester 2008-2009 (081)

**Module 5.2: Introduction to
ASP.NET and Web Forms**

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Objectives/Outline

- **Objectives**

- Understand the server controls and how to use them

- **Outline**

- HTML Server Control
- Web Controls
 - Intrinsic controls
 - List controls
 - Rich controls
 - Validation controls

HTML Controls

- Work well with existing HTML designers
 - i.e., when converting existing ASP 3.0 Web pages to ASP.NET Web pages
 - Easier to change to HTML server controls than to Web server controls
- Properties map 1:1 with HTML
 - `table.bgcolor="red";`
- Can specify client-side event handlers
- Good when quickly converting existing pages
- Derived from `System.Web.UI.HtmlControls.HtmlControl`
- Supported controls have custom class, others derive from `HtmlGenericControl`
 - `HtmlAnchor` controls the `<a>` element
 - `HtmlButton` controls the `<button>` element
 - `HtmlForm` controls the `<form>` element
 - etc

HTML Controls (cont.)

- Can use controls two ways:
 - Handle everything in action events (e.g. button click)
 - Event code will read the values of other controls (e.g. text, check boxes, radio buttons, select lists)
 - Handle change events as well as action events

Examples

HTMLControls1.aspx

```
<%@ Page Language="c#" %>
<script runat="server">
    public void accumulate (object sender, System.EventArgs e) {
        int a, b;
        if (IsPostBack) {
            a = int.Parse(number.Value);
            b = int.Parse(label.InnerText);
            label.InnerText = (a + b).ToString();
        }
    }
</script>
<html>
<head>
</head>
<body>
    <form method="post" runat="server">
        Enter a number: <input type="text" id="number" runat="server"/>
        Sum: <span id="label" runat="server"> 0 </span><br />
        <input type="submit" onclick="accumulate" value="Add" runat="server"/>
    </form>
</body>
</html>
```

➤ Another Example: HTMLControls2.aspx

Web Controls

- Web controls appear in HTML markup as namespaced tags with prefix asp:

- Example

```
<asp:button onclick="button1_click" runat="server">
<asp:textbox onchange="text1_changed" runat="server">
```

- Defined in `System.Web.UI.WebControls` namespace
 - Which is automatically mapped to the `asp:` prefix
- Provide extensive properties used to control display and format, e.g.
 - Font
 - BackColor, ForeColor
 - BorderColor, BorderStyle, BorderWidth
 - Style, CssClass
 - Height, Width
 - Visible, Enabled

Types of Web Controls

- Four types of Web Controls
 - Intrinsic controls
 - List controls
 - Rich controls
 - Validation controls

Intrinsic Controls

- Correspond to HTML controls
- Supported controls
 - <asp: button>
 - <asp: i magebutton>
 - <asp: l i nkbutton>
 - <asp: hyperl i nk>
 - <asp: textbox>
 - <asp: checkbox>
 - <asp: radi obutton>
 - <asp: i mage>
 - <asp: l abel >
 - <asp: panel >
 - <asp: tabl e>
- TextBox, CheckBox and their subclasses don't automatically do a postback when their controls are changed
- Specify AutoPostBack=" true" to make change events cause a postback

Examples

➤ Image

```
20 <asp:Image ID="userInfoImage" runat="server"
21     EnableViewState="False" ImageUrl="-/Images/user.png" /> &nbsp;
```

➤ TextBox

```
36 <asp:TextBox ID="lastNameTextBox" runat="server"
37     EnableViewState="False"></asp:TextBox>
```

➤ Hyperlink

```
76 <asp:HyperLink ID="booksHyperLink" runat="server"
77     EnableViewState="False" NavigateUrl="http://www.dell.com"
78     Target="_blank">
79     Click here to view more information about our books
80 </asp:HyperLink>
```

➤ Button

```
99 <asp:Button ID="registerButton" runat="server"
100     EnableViewState="False" Text="Register" />
```

List Controls

➤ Controls that handle repetition

➤ Supported controls

- <asp:dropdownlist>
- <asp:ListBox>
- <asp:radiobuttonlist>
- <asp:checkboxlist>
- <asp:repeater>
- <asp:datalist>
- <asp:datagrid>

➤ Repeater, DataList, and DataGrid controls

- Powerful, customizable list controls
- Expose templates for customization
- Can contain other controls
- Provide event bubbling through their OnItemCommand event
- More about these controls and templates later

List Controls (cont.)

- CheckBoxList Provides a collection of check box controls
- Can be populated via data binding

```
<asp:CheckBoxList id="Check1" runat="server">
  <asp:ListItem>Item 1</asp:ListItem>
  <asp:ListItem>Item 2</asp:ListItem>
  <asp:ListItem>Item 3</asp:ListItem>
  <asp:ListItem>Item 4</asp:ListItem>
  <asp:ListItem>Item 5</asp:ListItem>
</asp:CheckBoxList>
```

List Controls (cont.)

- RadioButtonList Example

```
89 <asp:RadioButtonList ID="operatingSystemRadioButtonList"
90 runat="server" EnableViewState="False">
91 <asp:ListItem>Windows XP</asp:ListItem>
92 <asp:ListItem>Windows 2000</asp:ListItem>
93 <asp:ListItem>Windows NT</asp:ListItem>
94 <asp:ListItem>Linux</asp:ListItem>
95 <asp:ListItem>Other</asp:ListItem>
96 </asp:RadioButtonList>
```

- DropDownList Example

```
64 <asp:DropDownList ID="booksDropDownList" runat="server"
65 EnableViewState="False">
66 <asp:ListItem>Visual Basic 2005 How to Program 3e
67 </asp:ListItem>
68 <asp:ListItem>Visual C# 2005 How to Program 2e
69 </asp:ListItem>
70 <asp:ListItem>Java How to Program 6e</asp:ListItem>
71 <asp:ListItem>C++ How to Program 5e</asp:ListItem>
72 <asp:ListItem>XML How to Program 1e</asp:ListItem>
73 </asp:DropDownList>
```

Intrinsic & Simple List Controls

- Demo 1: WebControls1.aspx
 - Assorted intrinsic and list controls
- Demo 2: WebControls2.aspx
 - Same controls with AutoPostBack



Rich Controls

- Custom controls with rich functionality
- Supported Controls
 - <asp: calendar>
 - <asp: adrotator>
- More will be added
- 3rd party controls are coming
- Demo: RichControls1.aspx

AdRotator control

- Randomly selects an image to display
- Generates a hyperlink to the Web page associated with that image
- Browsers that do not support images display alternate text that is specified in the XML document
- The browser loads the Web page associated with that image when a user clicks the image or substituted text
- Example

```
18 <asp:AdRotator ID="countryRotator" runat="server"  
19     DataSourceID="adXmlDataSource" />  
20 <asp:XmlDataSource ID="adXmlDataSource" runat="server"  
21     DataFile="-/App_Data/AdRotatorInformation.xml">  
22 </asp:XmlDataSource>
```

AdRotator control (cont.)

```
1 <?xml version="1.0" encoding="utf-8"?>  
2 <!-- Fig. 25.16: AdRotatorInformation.xml -->  
3 <!-- XML file containing advertisement information. -->  
4 <Advertisements>  
5     <Ad>  
6         <ImageUrl>images/france.png</ImageUrl>  
7         <NavigateUrl>http://www.cia.gov/library/publications/  
8             the-world-factbook/geos/fr.html  
9         </NavigateUrl>  
10        <AlternateText>France Information</AlternateText>  
11        <Impressions>1</Impressions>  
12    </Ad>  
13  
14    <Ad>  
15        <ImageUrl>images/germany.png</ImageUrl>  
16        <NavigateUrl>http://www.cia.gov/library/publications/  
17            the-world-factbook/geos/gm.html  
18        </NavigateUrl>  
19        <AlternateText>Germany Information</AlternateText>  
20        <Impressions>1</Impressions>  
21    </Ad>  
22 </Advertisements>
```


Validation Controls

- Determines whether the data in another Web control is in the proper format
- Rich, declarative validation
- Validation declared separately from input control
- Extensible validation framework
- Supports validation on client and server
 - Automatically detects uplevel clients
 - Avoids roundtrips for uplevel clients
- For security reasons, server-side validation is always performed for important validation when client-side cannot be trusted
 - Prevents users from spoofing Web Forms

Validation Controls (cont.)

- `<asp: RequiredFieldValidator>`
 - Ensures that a value is entered
- `<asp: RangeValidator>`
 - Checks if value is within minimum and maximum values
- `<asp: CompareValidator>`
 - Compares value against constant, another control or data type
- `<asp: RegularExpressionValidator>`
 - Tests if value matches a predefined pattern (a regular expression)
 - That expression is assigned to `ValidationExpression` property
- `<asp: CustomValidator>`
 - Lets you create custom client- or server-side validation function
- `<asp: ValidationSummary>`
 - Displays list of validation errors in one place

Validation Controls (cont.)

- Validation controls are derived from System.Web.UI.WebControls.BaseValidator, which is derived from the Label control
- Validation controls contain text which is displayed only if validation fails
- Text property is displayed at control location
- ErrorMessage is displayed in summary if validation fails

Validation Controls (cont.)

- Validation controls are associated with their target control using the ControlToValidate property

```
<asp:TextBox id="TextBox1" runat="server" />  
  
<asp:RequiredFieldValidator id="Req1"  
ControlToValidate="TextBox1"  
Text="Required Field" runat="server" />
```

- Can create multiple validation controls with the same target control

Validation Controls (cont.)

- Page.IsValid indicates if all validation controls on the page succeed

```
void Submit_Click(object s, EventArgs e) {  
    if (Page.IsValid) {  
        Message.Text = "Page is valid!";  
    }  
}
```

Validation Controls (cont.)

- Display property controls how the error message is shown
 - Static: fixed layout, display won't change if invalid; Space for the validation message is allocated in the page layout
 - Dynamic: Space for the validation message is dynamically added to the page if validation fails
 - None: Validation message is never displayed; can still use ValidationSummary and Page.IsValid
- Type property specifies expected data type: Currency, Date, Double, Integer, String
- Can force down-level option
 - Only server-side validation

```
<% @ Page Language="c#" ClientTarget="DownLevel" %>
```

Validation Control Demo



```
1 <!-- Fig. 25.17: Validation.aspx -->
2 <!-- Form that demonstrates using validators to validate user input. -->
3 <% Page Language="VB" AutoEventWireup="false"
4   CodeFile="Validation.aspx.vb" Inherits="Validation" %>
5
6 <!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
7   "http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
8
9 <html xmlns="http://www.w3.org/1999/xhtml" >
10 <head runat="server">
11   <title>Demonstrating Validation Controls</title>
12 </head>
13 <body>
14   <form id="form1" runat="server">
15     <div>
16       Please fill out the following form. <br /><em>All fields are
17       required and must contain valid information.</em><br />
18     <br />
19     <table>
20       <tr>
21         <td style="width: 100px; vertical-align: top">
22           Name: </td>
23         <td style="width: 450px; vertical-align: top">
24           <asp:TextBox ID="nameTextBox" runat="server">
25             </asp:TextBox><br />
26           <asp:RequiredFieldValidator
27             ID="nameInputValidator" runat="server"
28             ControlToValidate="nameTextBox" Display="Dynamic"
29             ErrorMessage="Please enter your name." >
30           </asp:RequiredFieldValidator>
```

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Outline

Validation.aspx
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Defines a RequiredFieldValidator which confirms the TextBox is not empty

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31 </td>
 32 </tr>
 33 <tr>
 34 <td style="width: 100px; vertical-align: top">E-mail address: </td>
 35 <td style="width: 450px; vertical-align: top">
 36 <asp:TextBox ID="emailTextBox" runat="server">
 37 </asp:TextBox>
 38 e.g., user@domain.com

 39 <asp:RequiredFieldValidator
 40 ID="emailInputValidator" runat="server"
 41 ControlToValidate="emailTextBox" Display="Dynamic"
 42 ErrorMessage="Please enter your e-mail address.">
 43 </asp:RequiredFieldValidator>
 44 <asp:RegularExpressionValidator
 45 ID="emailFormatValidator" runat="server"
 46 ControlToValidate="emailTextBox" Display="Dynamic"
 47 ErrorMessage=
 48 "Please enter an e-mail address in a valid format."
 49 ValidationExpression=
 50 "\w+([-+']\w+)*@\w+([-.]\w+)*\.\w+([-.]\w+)*"
 51 </asp:RegularExpressionValidator>
 52 </td>
 53 </tr>
 54 <tr>
 55 <td style="width: 100px; height: 21px; vertical-align: top">
 56 Phone number: </td>
 57 <td style="width: 450px; height: 21px; vertical-align: top">
 58 <asp:TextBox ID="phoneTextBox" runat="server">
 59 </asp:TextBox>

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Outline

Defines a RequiredFieldValidator which confirms the TextBox is not empty

Defines a RegularExpressionValidator control to determine whether data is entered in a valid format

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60 e.g., (555) 555-1234

 61 <asp:RequiredFieldValidator
 62 ID="phoneInputValidator" runat="server"
 63 ControlToValidate="phoneTextBox" Display="Dynamic"
 64 ErrorMessage="Please enter your phone number.">
 65 </asp:RequiredFieldValidator>
 66 <asp:RegularExpressionValidator
 67 ID="phoneFormatValidator" runat="server"
 68 ControlToValidate="phoneTextBox" Display="Dynamic"
 69 ErrorMessage=
 70 "Please enter a phone number in a valid format."
 71 ValidationExpression=
 72 "((\d{3}\d{3})?)?(\d{3}-)?\d{3}-\d{4}">
 73 </asp:RegularExpressionValidator>
 74 </td>
 75 </tr>
 76 </table>
 77

 78 <asp:Button ID="submitButton" runat="server" Text="Submit" />

 79

 80 <asp:Label ID="outputLabel" runat="server"
 81 Text="Thank you for your submission." Visible="False">
 82 </asp:Label >
 83 </div>
 84 </form>
 85 </body>
 86 </html >

26

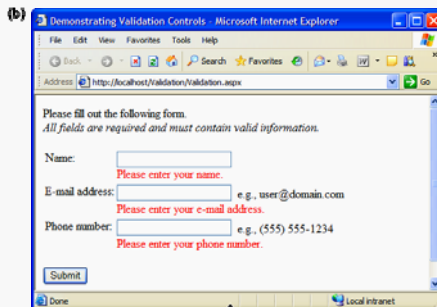
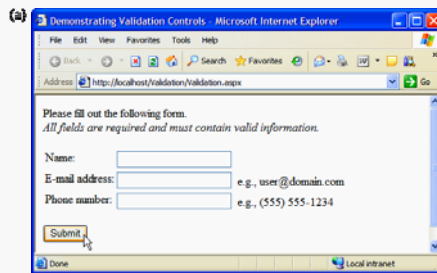
Outline

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Defines a RequiredFieldValidator which confirms the TextBox is not empty

Defines a RegularExpressionValidator control to determine whether data is entered in a valid format

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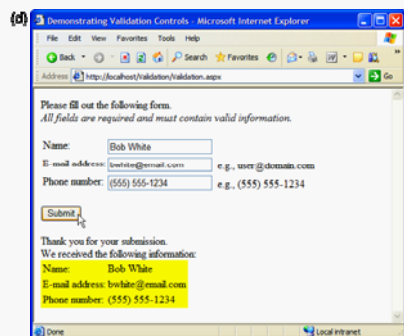
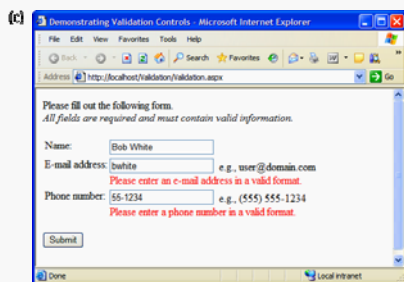
Outline

Validation.aspx

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Outline

Validation.aspx

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Q & A



References

- H. M. Deitel, P. J. Deitel, and A. B. Goldberg, *Internet and World Wide Web How to Program*, 4/e, Pearson Education Inc., 2008.
- Some useful links with examples and other resources:
 - <http://msdn.microsoft.com/net/aspnet/default.asp>
 - The Official Microsoft ASP.NET Site www.asp.net
 - ASP.NET QuickStart Tutorial
 - <http://quickstarts.asp.net/QuickstartV20/aspnet/>
 - <http://samples.gotdotnet.com/quickstart/aspplus/>
 - W3School ASP.NET Tutorial
 - <http://www.w3schools.com/ASPNET/default.asp>
 - ASP.NET at wikipedia <http://en.wikipedia.org/wiki/ASP.NET>
 - <http://www.asptoday.com/>
 - <http://www.aspfree.com/>
 - <http://www.devx.com/dotnet/>
 - <http://msdn.microsoft.com>
 - Several Online Presentations