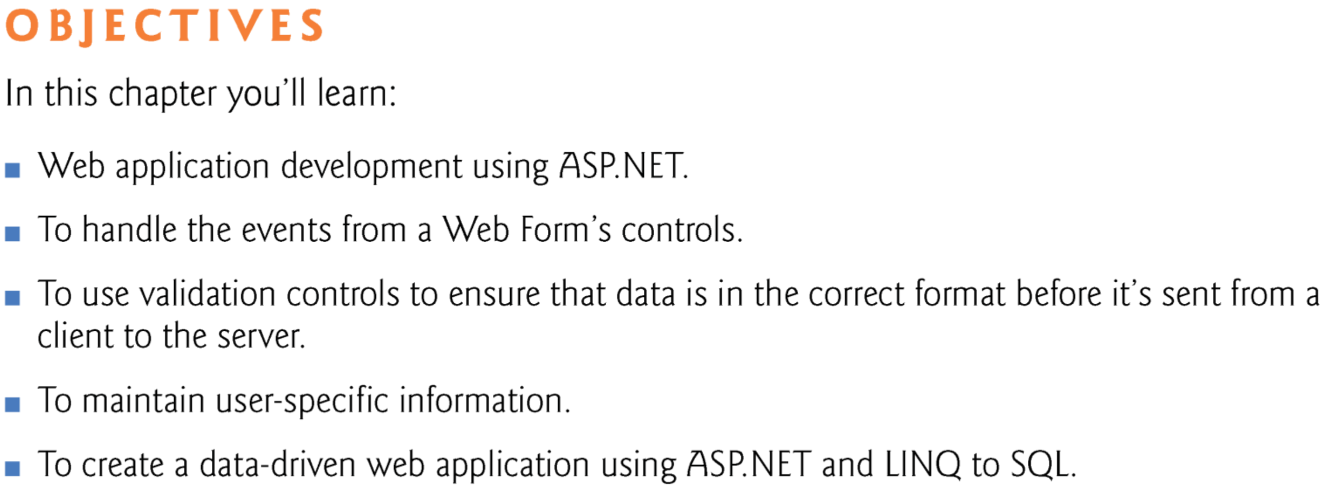
# Chapter 24: Web App Development with ASP.NET in VB, A Deeper Look

Internet & World Wide Web
How to Program, 5/e

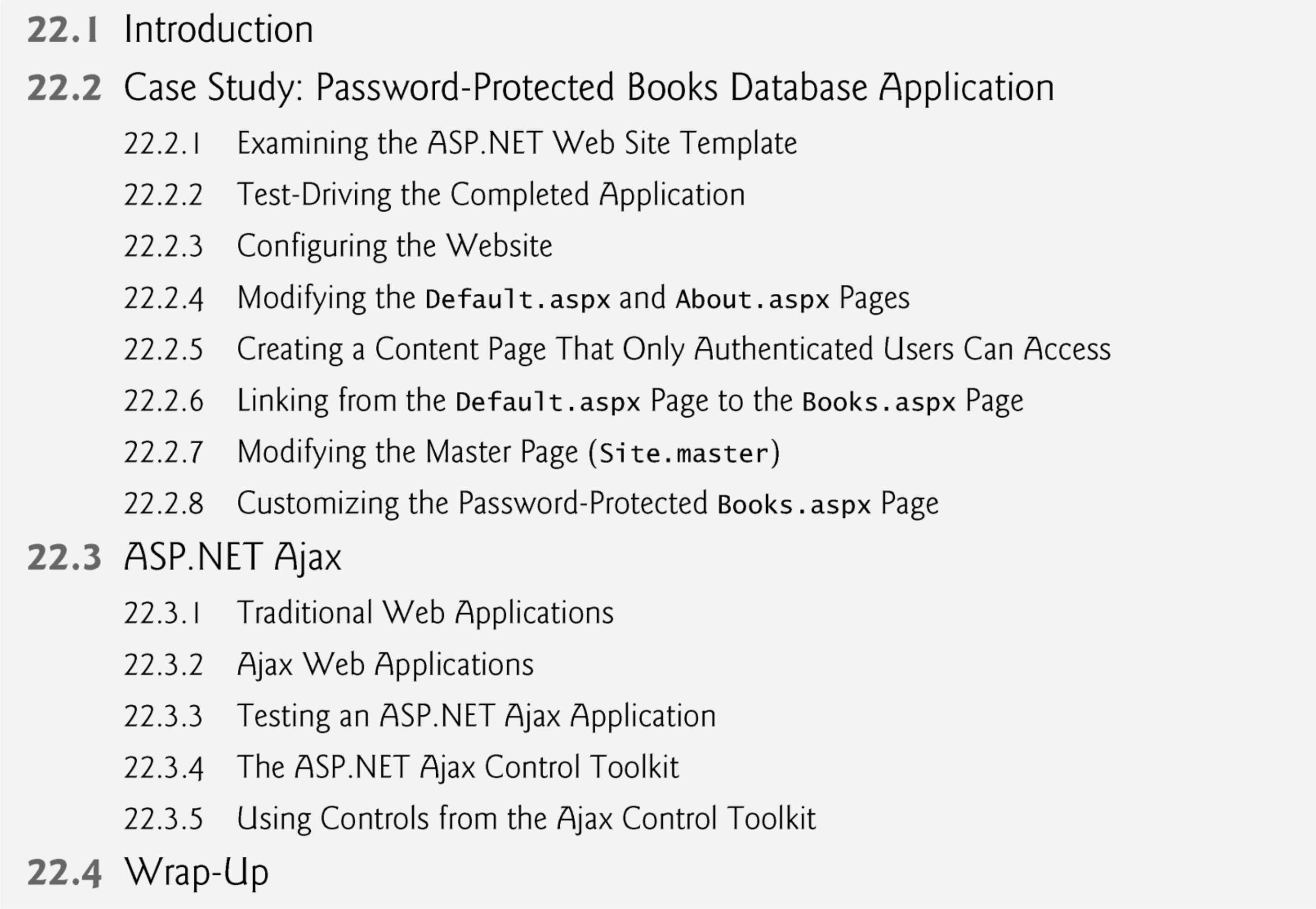
*Note:* This chapter is a copy of Chapter 22 of our book *Visual Basic 2010 How to Program*. For that reason, we simply copied the PowerPoint slides for this chapter and *did not* re-numb er them



## OBJECTIVES

In this chapter you'll learn:

- Web application development using ASP.NET.
- To handle the events from a Web Form's controls.
- To use validation controls to ensure that data is in the correct format before it's sent from a client to the server.
- To maintain user-specific information.
- To create a data-driven web application using ASP.NET and LINQ to SQL.



**22.1** Introduction

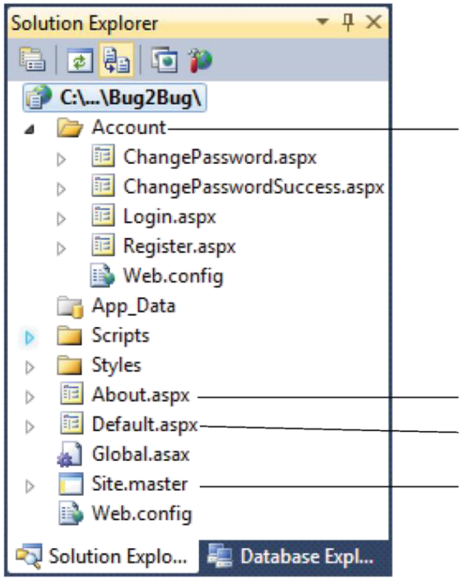
**22.2** Case Study: Password-Protected Books Database Application

- 22.2.1 Examining the ASP.NET Web Site Template
- 22.2.2 Test-Driving the Completed Application
- 22.2.3 Configuring the Website
- 22.2.4 Modifying the `Default.aspx` and `About.aspx` Pages
- 22.2.5 Creating a Content Page That Only Authenticated Users Can Access
- 22.2.6 Linking from the `Default.aspx` Page to the `Books.aspx` Page
- 22.2.7 Modifying the Master Page (`Site.master`)
- 22.2.8 Customizing the Password-Protected `Books.aspx` Page

**22.3** ASP.NET Ajax

- 22.3.1 Traditional Web Applications
- 22.3.2 Ajax Web Applications
- 22.3.3 Testing an ASP.NET Ajax Application
- 22.3.4 The ASP.NET Ajax Control Toolkit
- 22.3.5 Using Controls from the Ajax Control Toolkit

**22.4** Wrap-Up



`Account` folder expanded to show the default pages for login, registration and changing passwords

**About** page

Default home page

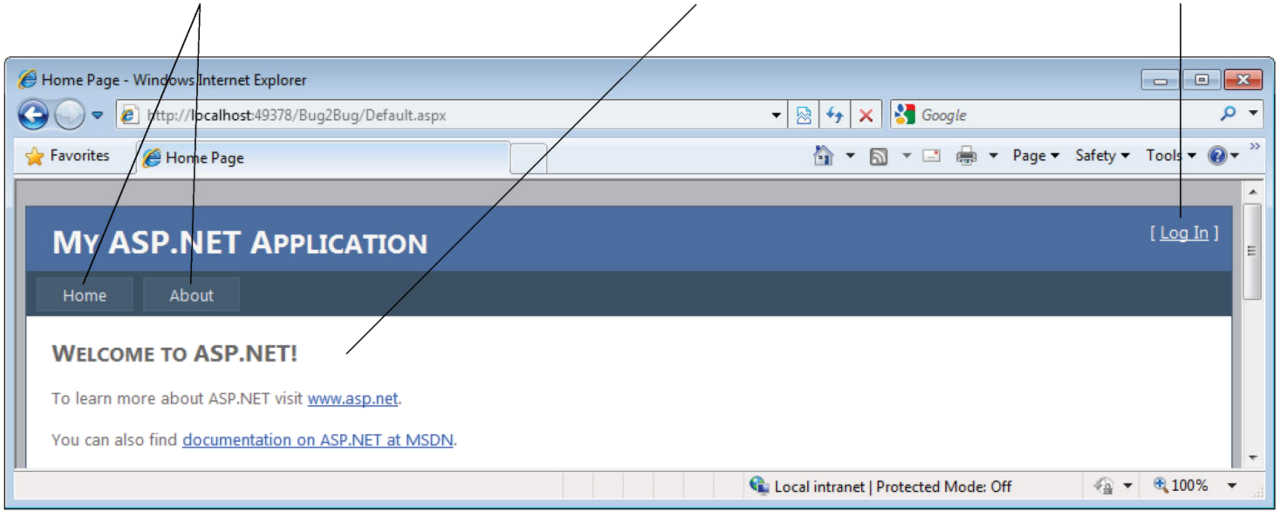
Master page that specifies the site’s look and feel

Fig. 22.1 | The default **ASP.NET Web Site** in the **Solution Explorer**.

Navigation bar contains links to the **Home** and **About** pages

You can customize the content of each page and the look-and-feel of the website

Click this link to log into the website



Home Page - Windows Internet Explorer
http://localhost:49378/Bug2Bug/Default.aspx
Google
Favorites
Home Page
Page
Safety
Tools
Home
About
[ Log In ]
Local intranet | Protected Mode: Off
100%

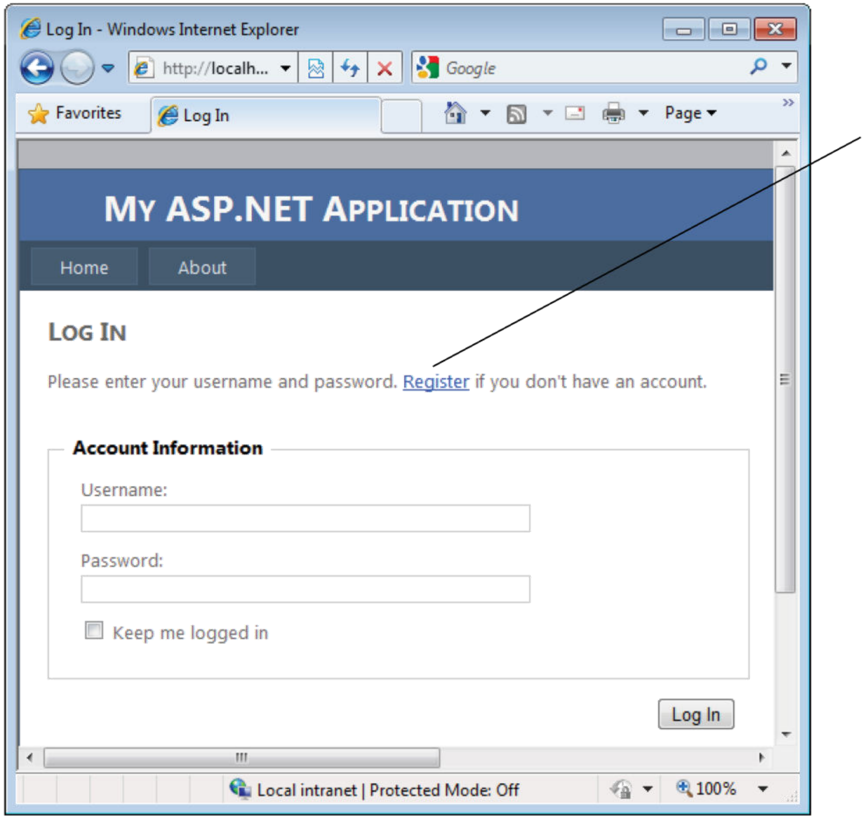
My ASP.NET Application

Welcome to ASP.NET!

To learn more about ASP.NET visit www.asp.net.

You can also find documentation on ASP.NET at MSDN.

Fig. 22.2 | Default **Home** page of a website created with the **ASP.NET Web Site** template.


Log In - Windows Internet Explorer
http://localh...
Google
Favorites
Log In
Page
Home
About
Log In
Local intranet | Protected Mode: Off
100%

MY ASP.NET APPLICATION

LOG IN

Please enter your username and password. Register if you don't have an account.

**Account Information**

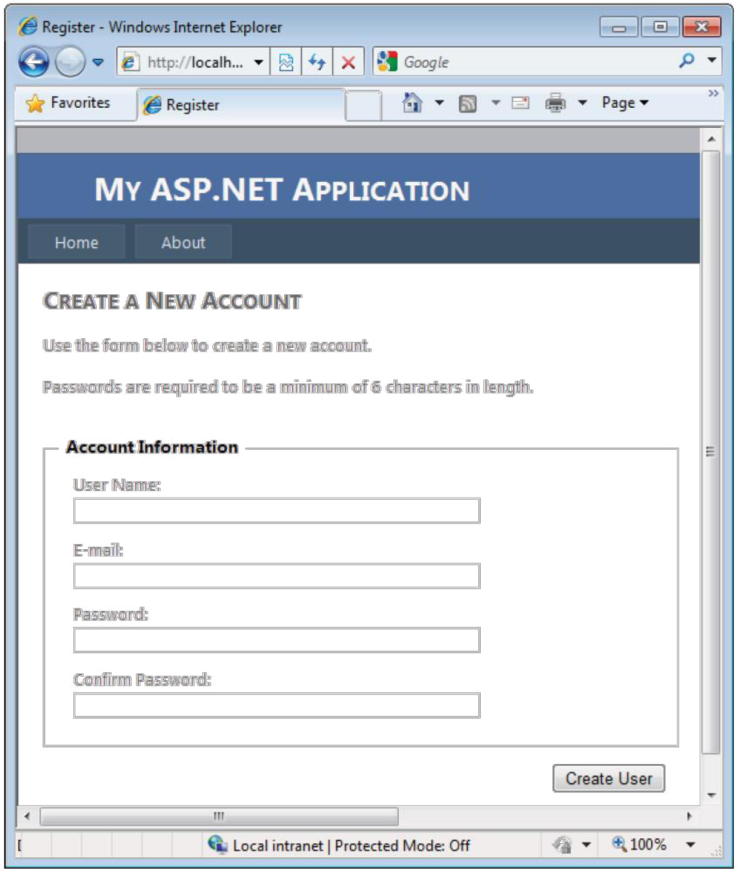
Username:

Password:

□ Keep me logged in

Click here to register

Fig. 22.3 | Login page.



Create a New Account

Use the form below to create a new account.

Passwords are required to be a minimum of 6 characters in length.

Account Information

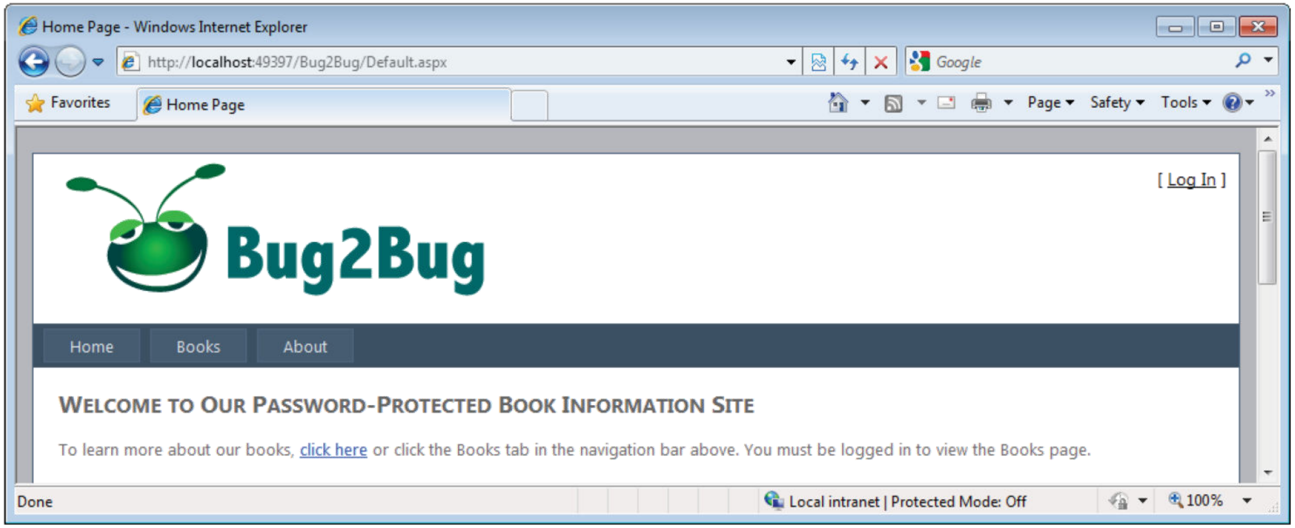
User Name:

E-mail:

Password:

Confirm Password:

**Fig. 22.4** | Register page.

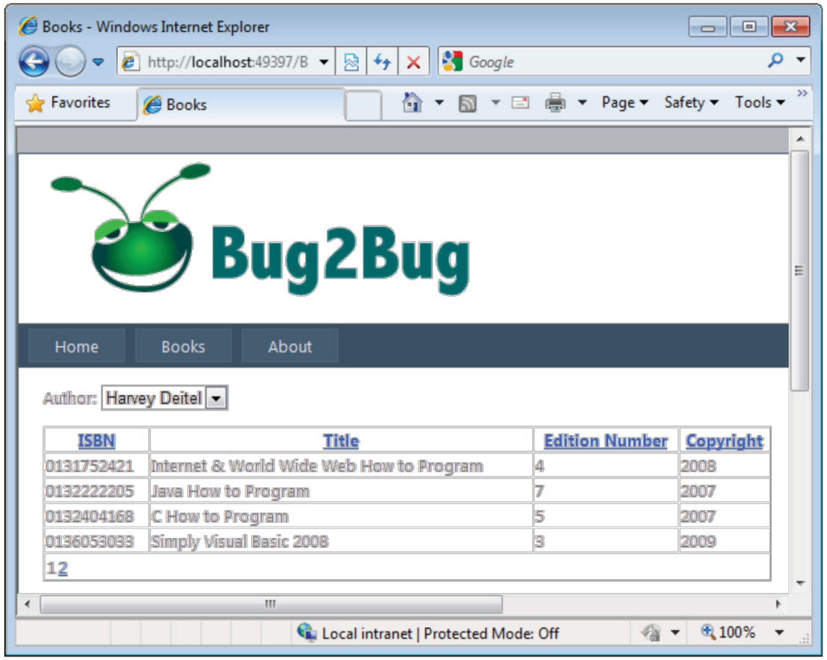


Home Page - Windows Internet Explorer
http://localhost:49397/Bug2Bug/Default.aspx
Google
Favorites
Home Page
Page
Safety
Tools
[ Log In ]
Bug2Bug
Home
Books
About
Done
Local intranet | Protected Mode: Off
100%

WELCOME TO OUR PASSWORD-PROTECTED BOOK INFORMATION SITE

To learn more about our books, click here or click the Books tab in the navigation bar above. You must be logged in to view the Books page.

Fig. 22.5 | Home page for the completed Bug2Bug website.



Author: Harvey Deitel

| ISBN | Title | Edition Number | Copyright |
|---|---|---|---|
| 0131752421 | Internet & World Wide Web How to Program | 4 | 2008 |
| 0132222205 | Java How to Program | 7 | 2007 |
| 0132404168 | C How to Program | 5 | 2007 |
| 0136053033 | Simply Visual Basic 2008 | 3 | 2009 |

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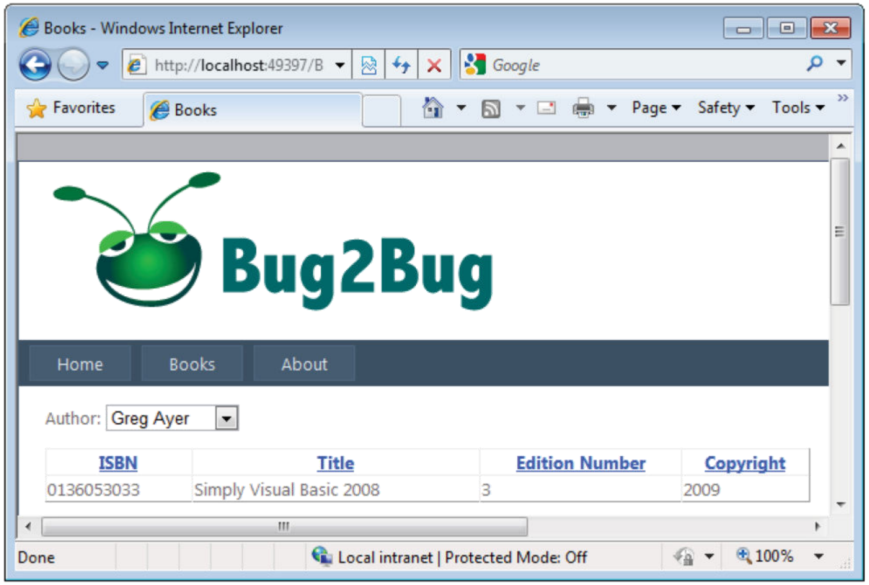
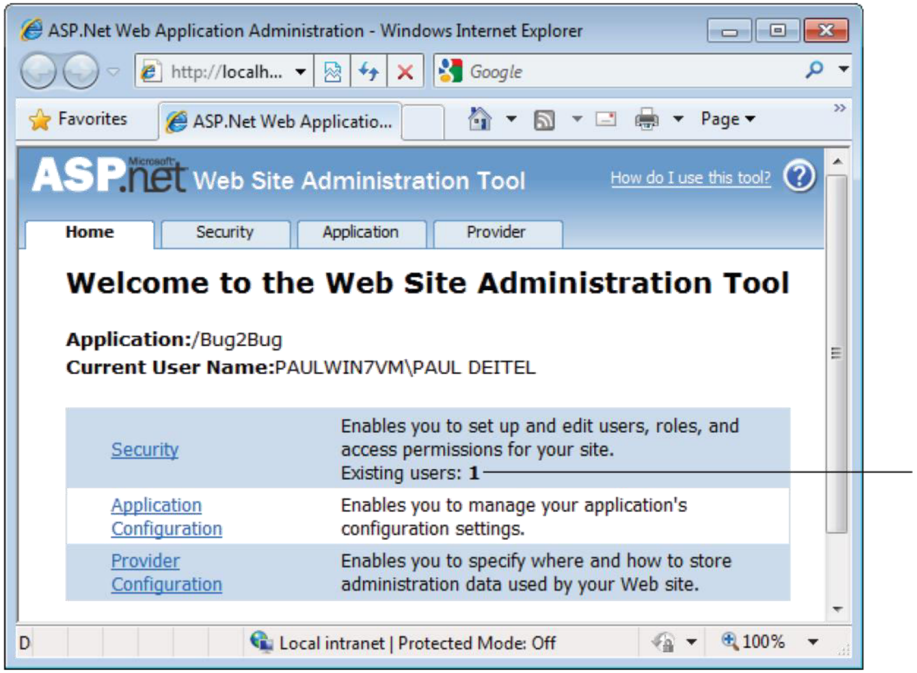
**Fig. 22.6** | Books.aspx displaying books by Harvey Deitel (by default).



Author: Greg Ayer

| ISBN | Title | Edition Number | Copyright |
|---|---|---|---|
| 0136053033 | Simply Visual Basic 2008 | 3 | 2009 |

Fig. 22.7 | Books.aspx displaying books by Greg Ayer.


ASP.Net Web Application Administration - Windows Internet Explorer
http://localh...
Google
Favorites
ASP.Net Web Applicatio...
Page
ASP.net Web Site Administration Tool
How do I use this tool?
Home
Security
Application
Provider
D
Local intranet | Protected Mode: Off
100%

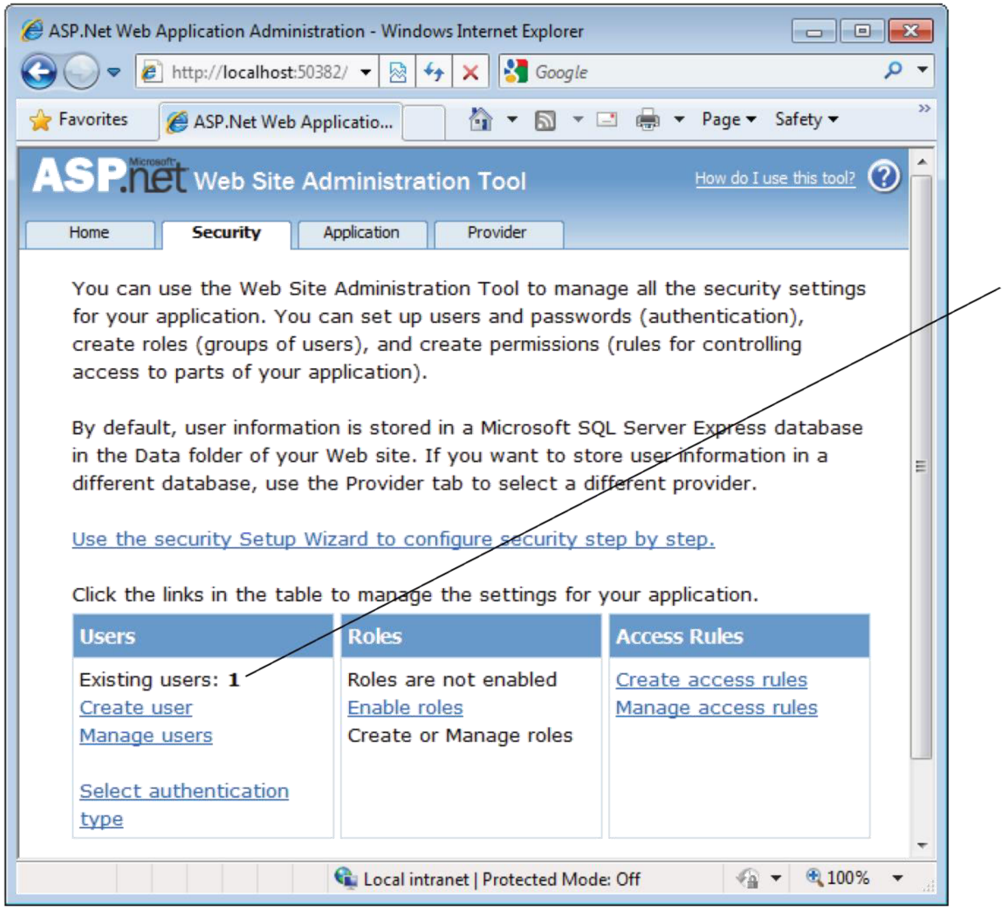
**Welcome to the Web Site Administration Tool**

**Application:**/Bug2Bug
**Current User Name:**PAULWIN7VM\PAUL DEITEL

| | |
|---|---|
| Security | Enables you to set up and edit users, roles, and access permissions for your site.<br>Existing users: **1** |
| Application Configuration | Enables you to manage your application's configuration settings. |
| Provider Configuration | Enables you to specify where and how to store administration data used by your Web site. |

This will say **0** if you have not yet created an account to test the website

**Fig. 22.8** | **Web Site Administration Tool** for configuring a web application.


ASP.Net Web Application Administration - Windows Internet Explorer
http://localhost:50382/
Google
Favorites
ASP.Net Web Applicatio...
Page
Safety
ASP.net Web Site Administration Tool
How do I use this tool?
Home
Security
Application
Provider

You can use the Web Site Administration Tool to manage all the security settings for your application. You can set up users and passwords (authentication), create roles (groups of users), and create permissions (rules for controlling access to parts of your application).

By default, user information is stored in a Microsoft SQL Server Express database in the Data folder of your Web site. If you want to store user information in a different database, use the Provider tab to select a different provider.

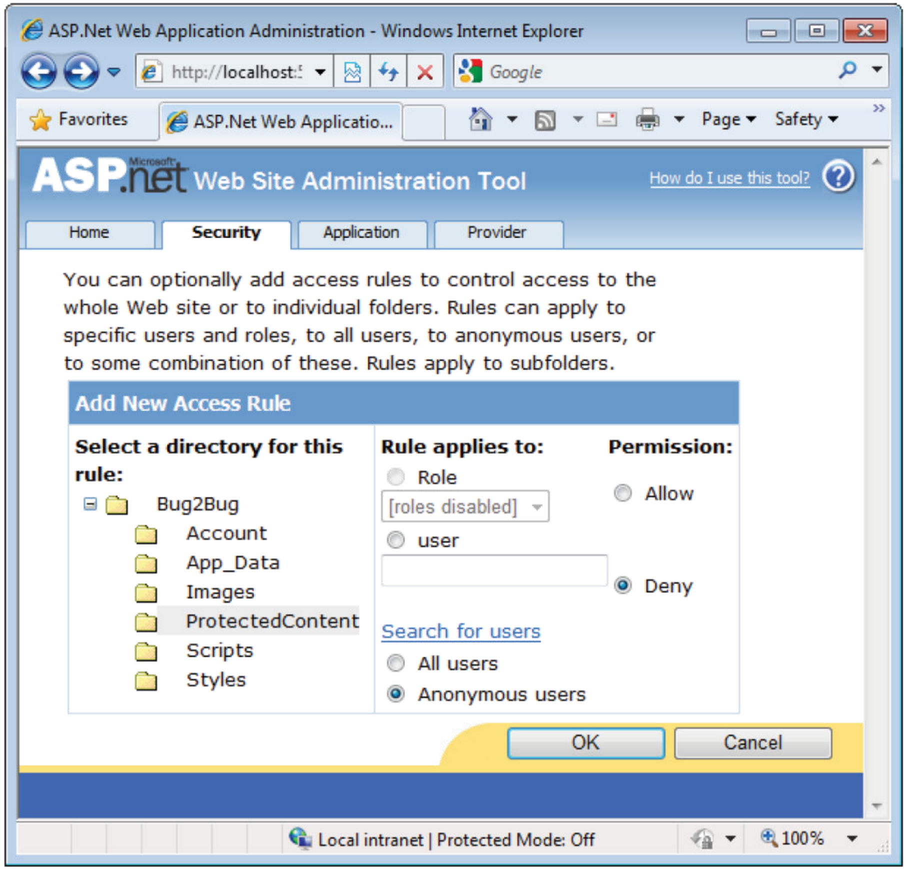
Use the security Setup Wizard to configure security step by step.

Click the links in the table to manage the settings for your application.

| Users | Roles | Access Rules |
|---|---|---|
| Existing users: **1**<br>Create user<br>Manage users<br><br>Select authentication type | Roles are not enabled<br>Enable roles<br>Create or Manage roles | Create access rules<br>Manage access rules |

This will say **0** if you have not yet created an account to test the website

Fig. 22.9 | Security page of the Web Site Administration Tool.


ASP.Net Web Application Administration - Windows Internet Explorer
http://localhost:5
Google
Favorites
ASP.Net Web Applicatio...
Page
Safety
ASP.net Web Site Administration Tool
How do I use this tool?
Home
Security
Application
Provider

You can optionally add access rules to control access to the whole Web site or to individual folders. Rules can apply to specific users and roles, to all users, to anonymous users, or to some combination of these. Rules apply to subfolders.

Add New Access Rule

Select a directory for this rule:

- Bug2Bug
  - Account
  - App_Data
  - Images
  - ProtectedContent
  - Scripts
  - Styles

Rule applies to:

○ Role

[roles disabled]

○ user

Search for users

○ All users

● Anonymous users

Permission:

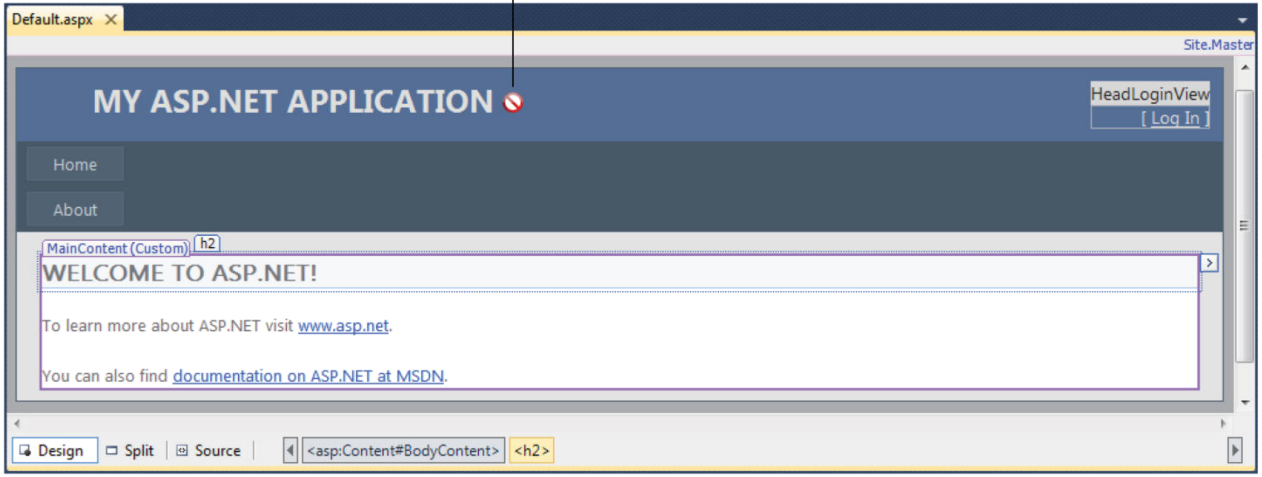
○ Allow

● Deny

OK Cancel

**Fig. 22.10** | **Add New Access Rule** page used to configure directory access.

This cursor indicates a part of a content page that cannot be edited because it's inherited from a master page

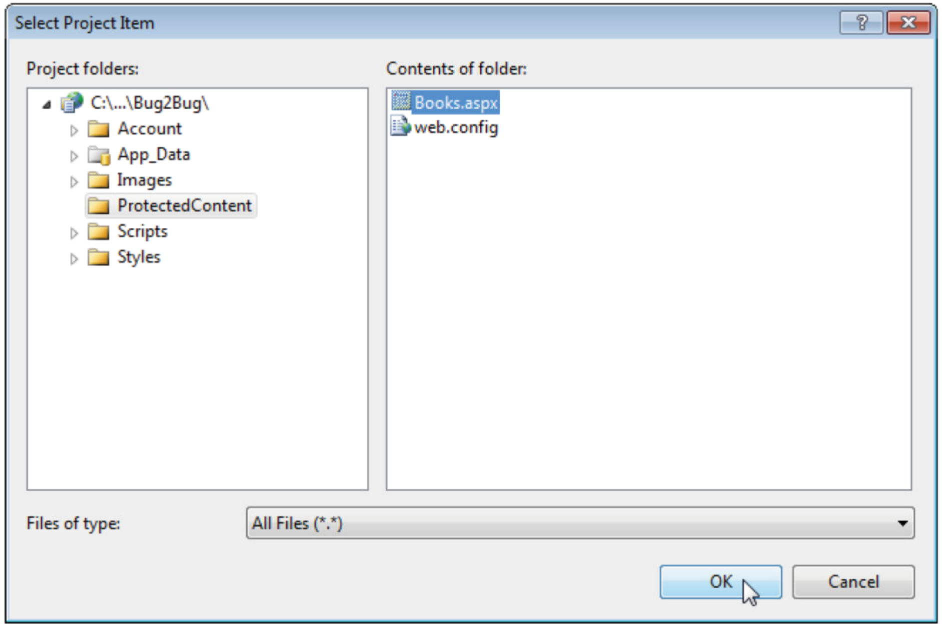


WELCOME TO ASP.NET!

To learn more about ASP.NET visit www.asp.net.

You can also find documentation on ASP.NET at MSDN.

**Fig. 22.11** | `Default.aspx` page in **Design** view.


Select Project Item

Project folders:

- C:\...\Bug2Bug\
  - Account
  - App_Data
  - Images
  - ProtectedContent
  - Scripts
  - Styles

Contents of folder:

- Books.aspx
- web.config

Files of type: All Files (*.*)

**Fig. 22.12** | Selecting the Books.aspx page from the Select Project Item dialog.

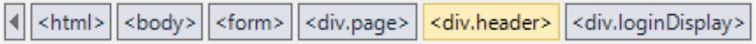


Fig. 22.13 | Buttons for selecting parts of a page in **Design** view.

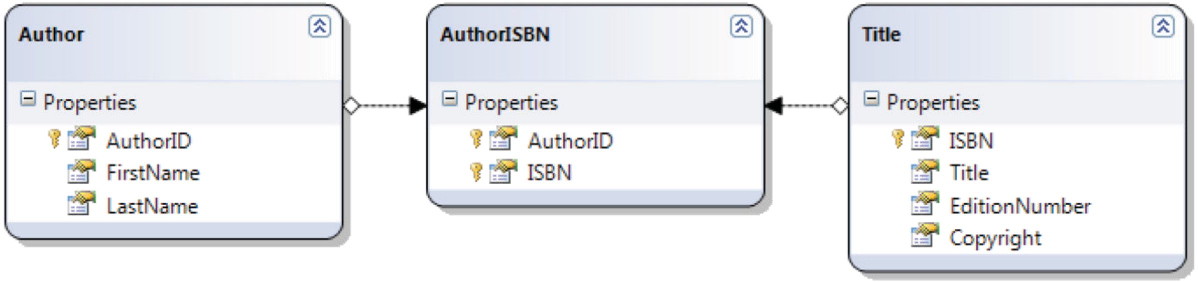
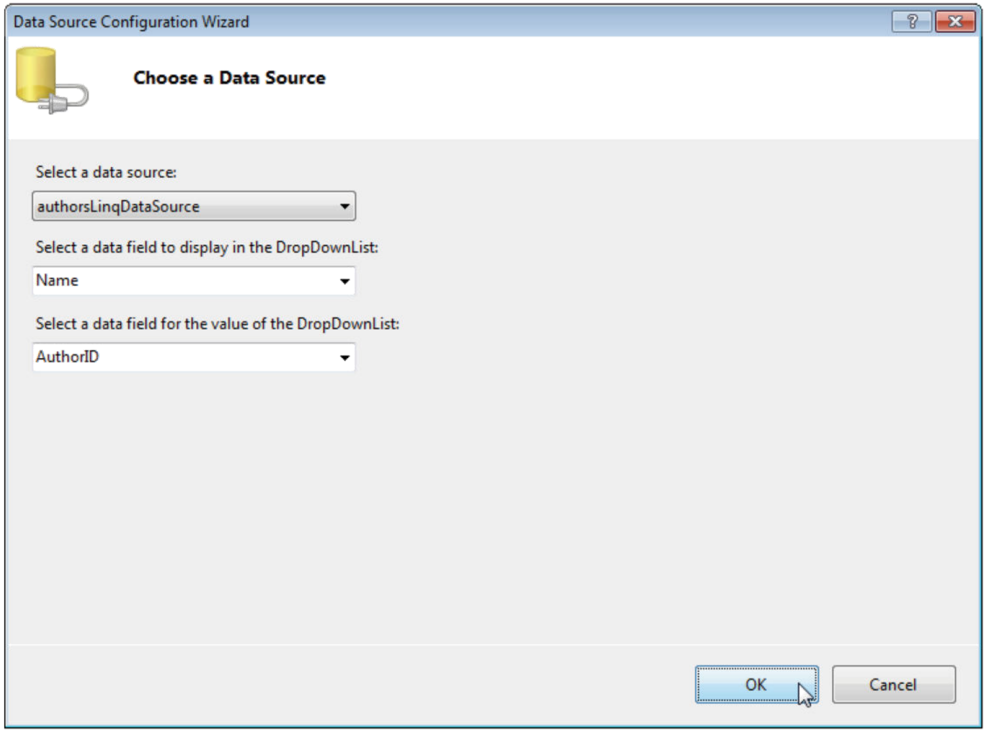


Fig. 22.14 | Object Relation Designer for the Books database.



Data Source Configuration Wizard

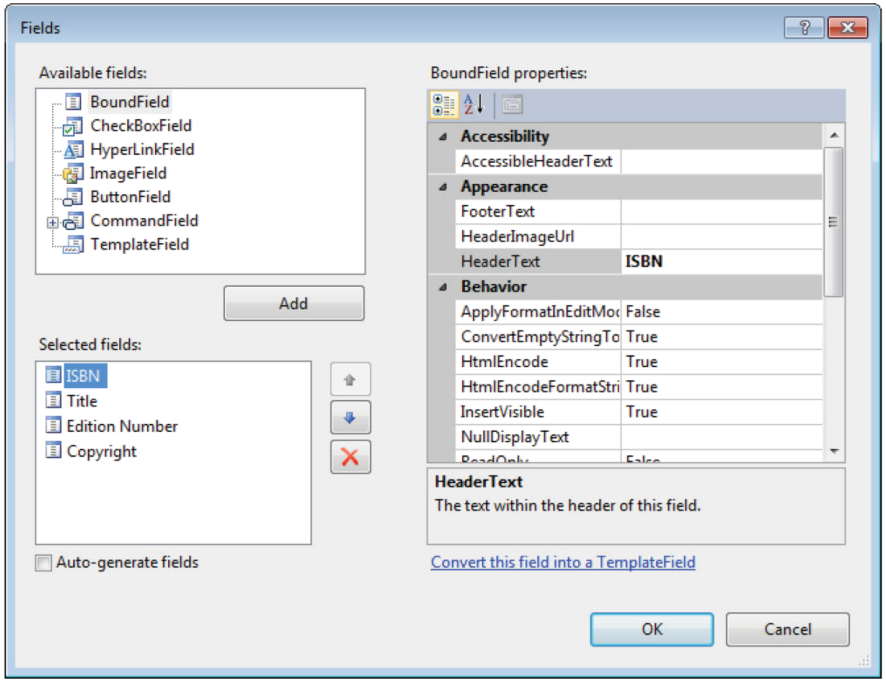
Choose a Data Source

Select a data source: authorsLinqDataSource

Select a data field to display in the DropDownList: Name

Select a data field for the value of the DropDownList: AuthorID

**Fig. 22.15** | Choosing a data source for a `DropDownList`.



Fields

Available fields:

- BoundField
- CheckBoxField
- HyperLinkField
- ImageField
- ButtonField
- CommandField
- TemplateField

Selected fields:

- ISBN
- Title
- Edition Number
- Copyright

☐ Auto-generate fields

BoundField properties:

| | |
|---|---|
| **Accessibility** | |
| AccessibleHeaderText | |
| **Appearance** | |
| FooterText | |
| HeaderImageUrl | |
| HeaderText | **ISBN** |
| **Behavior** | |
| ApplyFormatInEditMoc | False |
| ConvertEmptyStringTo | True |
| HtmlEncode | True |
| HtmlEncodeFormatStri | True |
| InsertVisible | True |
| NullDisplayText | |
| ReadOnly | False |

**HeaderText**
The text within the header of this field.

Convert this field into a TemplateField

**Fig. 22.16** | Creating `GridView` fields in the **Fields** dialog.

```
' Fig. 22.17: ProtectedContent_Books.aspx.vb
' Code-behind file for the password-protected Books page.
Partial Class ProtectedContent_Books
   Inherits System.Web.UI.Page

   ' data context queried by data sources
   Private database As New BooksDataContext()

   ' specify the Select query that creates a combined first and last name
   Protected Sub authorsLinqDataSource_Selecting(ByVal sender As Object,
      ByVal e As System.Web.UI.WebControls.LinqDataSourceSelectEventArgs) _
      Handles authorsLinqDataSource.Selecting

      e.Result =
         From author In database.Authors
         Select Name = author.FirstName & " " & author.LastName,
            author.AuthorID
   End Sub ' authorsLinqDataSource_Selecting

```

**Fig. 22.17** | Code-behind file for the password-protected **Books** page. (Part 1 of 2.)

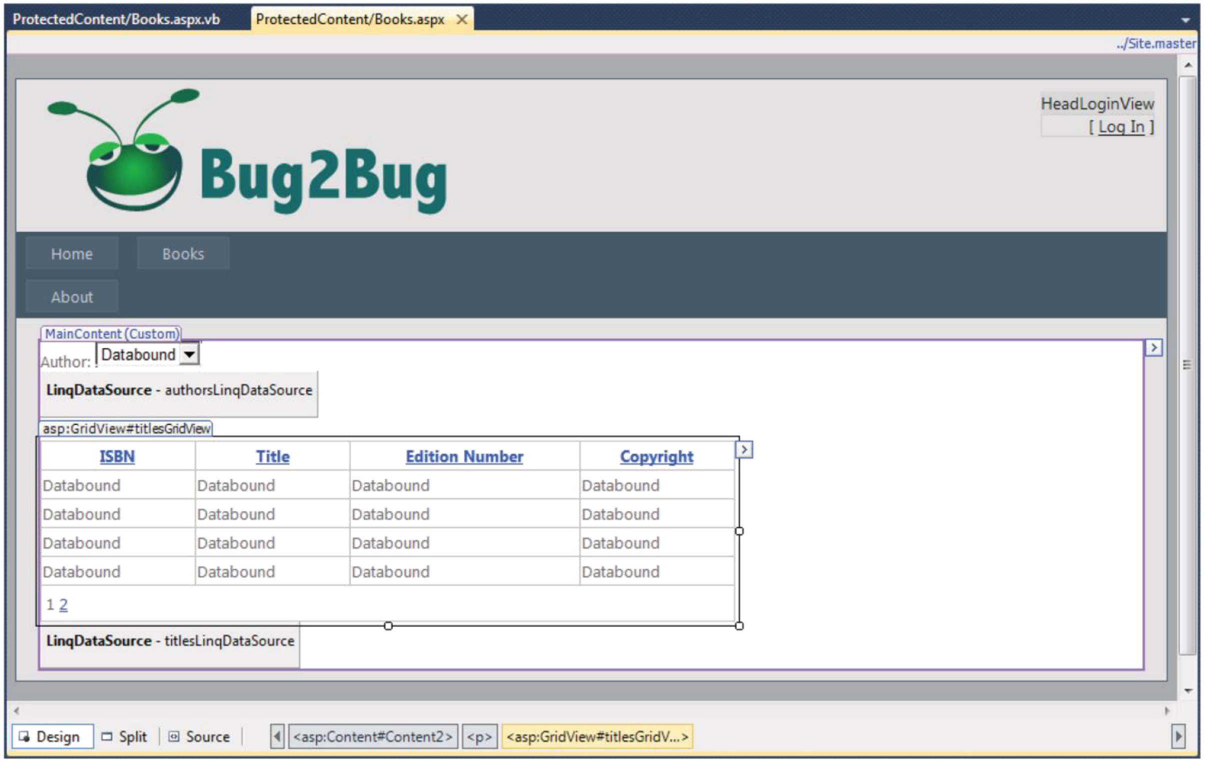
```
   ' specify the Select query that gets the specified author's books
   Protected Sub titlesLinqDataSource_Selecting(ByVal sender As Object,
      ByVal e As System.Web.UI.WebControls.LinqDataSourceSelectEventArgs) _
      Handles titlesLinqDataSource.Selecting

      e.Result =
         From book In database.AuthorISBNs
         Where book.AuthorID = authorsDropDownList.SelectedValue
         Select book.Title
   End Sub ' titlesLinqDataSource_Selecting

   ' refresh the GridView when a different author is selected
   Protected Sub authorsDropDownList_SelectedIndexChanged(
      ByVal sender As Object, ByVal e As System.EventArgs) _
      Handles authorsDropDownList.SelectedIndexChanged

      titlesGridView.DataBind() ' update the GridView
   End Sub ' authorsDropDownList_SelectedIndexChanged
End Class ' ProtectedContent_Books
```

**Fig. 22.17** | Code-behind file for the password-protected **Books** page. (Part 2 of 2.)



Author: Databound

LinqDataSource - authorsLinqDataSource

| ISBN | Title | Edition Number | Copyright |
|---|---|---|---|
| Databound | Databound | Databound | Databound |
| Databound | Databound | Databound | Databound |
| Databound | Databound | Databound | Databound |
| Databound | Databound | Databound | Databound |

1 2

LinqDataSource - titlesLinqDataSource

Fig. 22.18 | Completed Books.aspx page in Design mode.

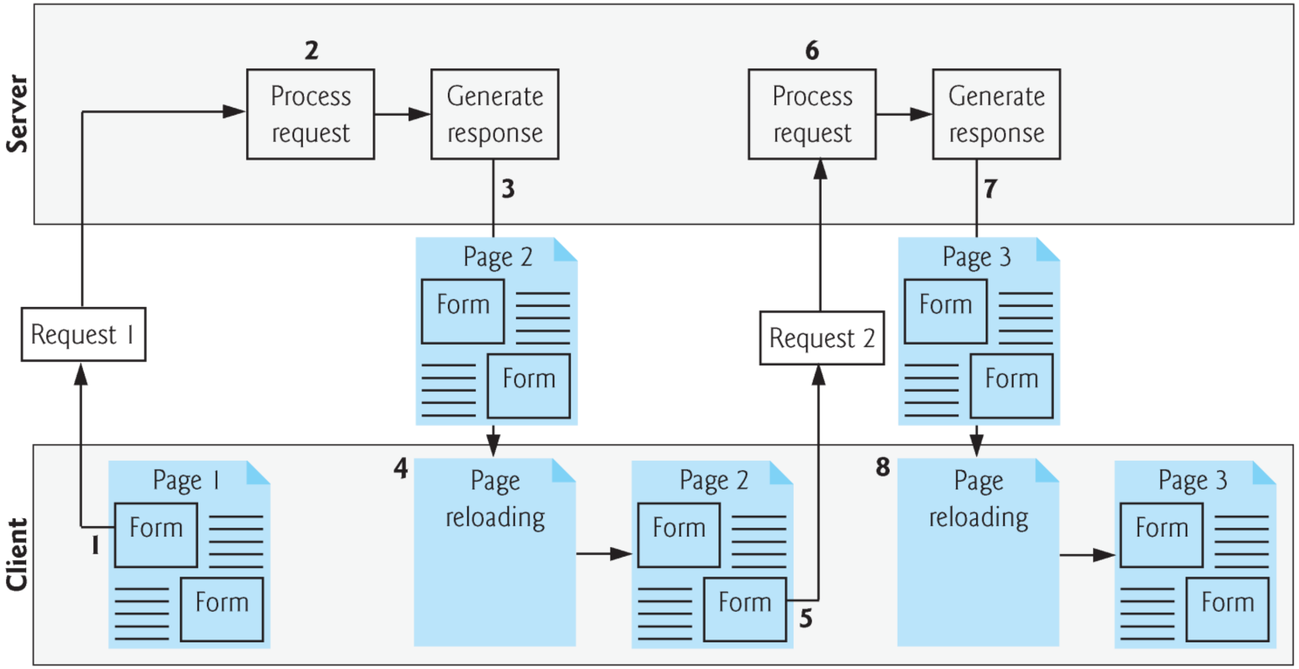


Fig. 22.19 | Traditional web application reloading the page for every user interaction.

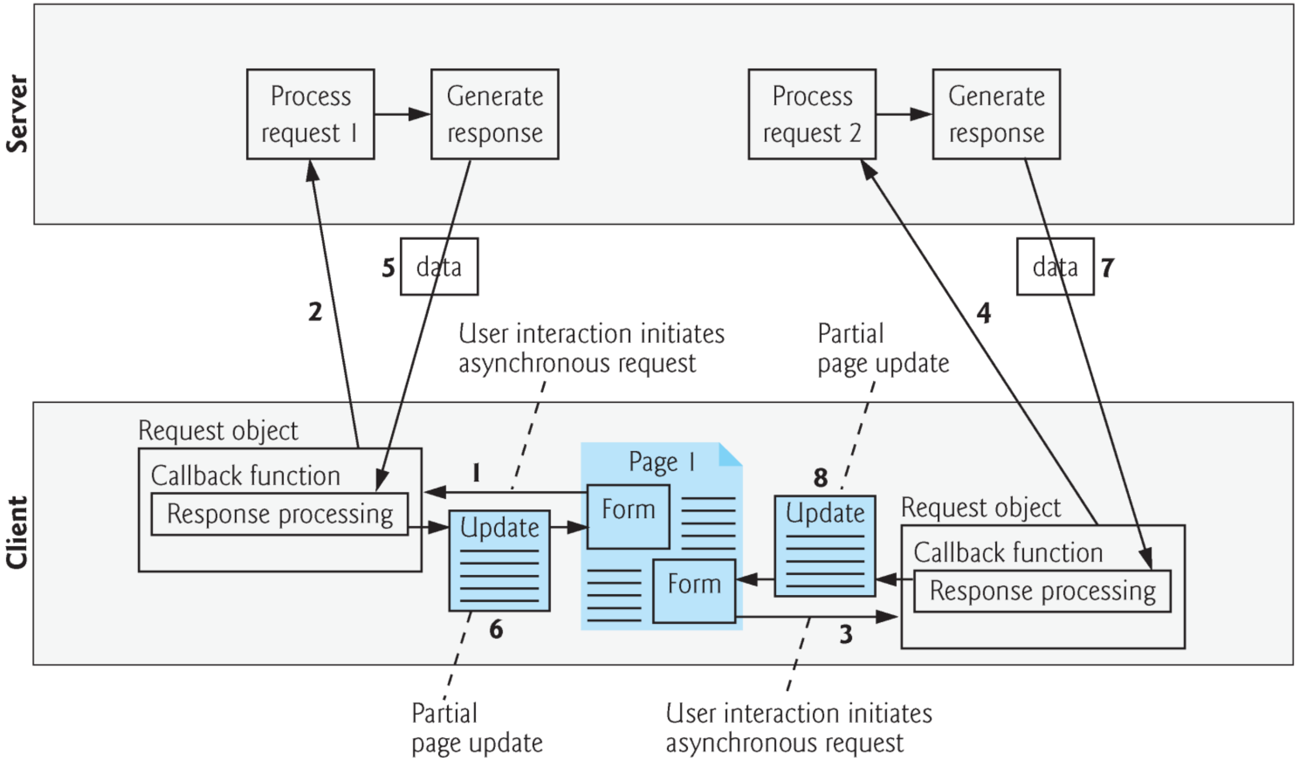
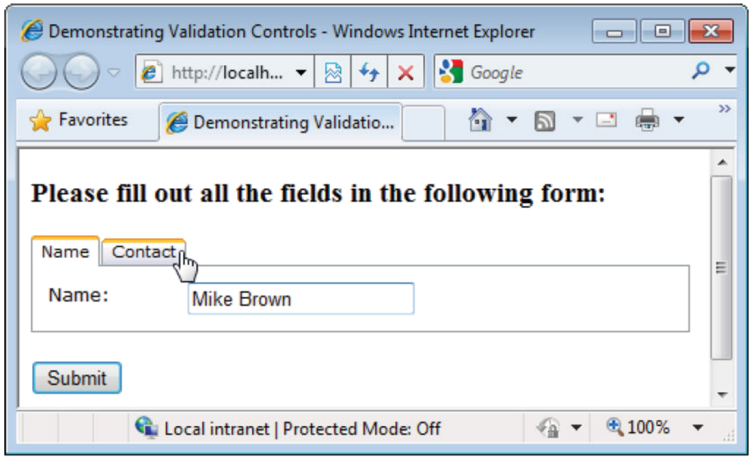


**Fig. 22.20** | Ajax-enabled web application interacting with the server asynchronously.

a) Entering a name on the **Name** tab then clicking the **Contact** tab



Demonstrating Validation Controls - Windows Internet Explorer
http://localh...
Google
Favorites
Demonstrating Validatio...
Local intranet | Protected Mode: Off
100%

**Please fill out all the fields in the following form:**

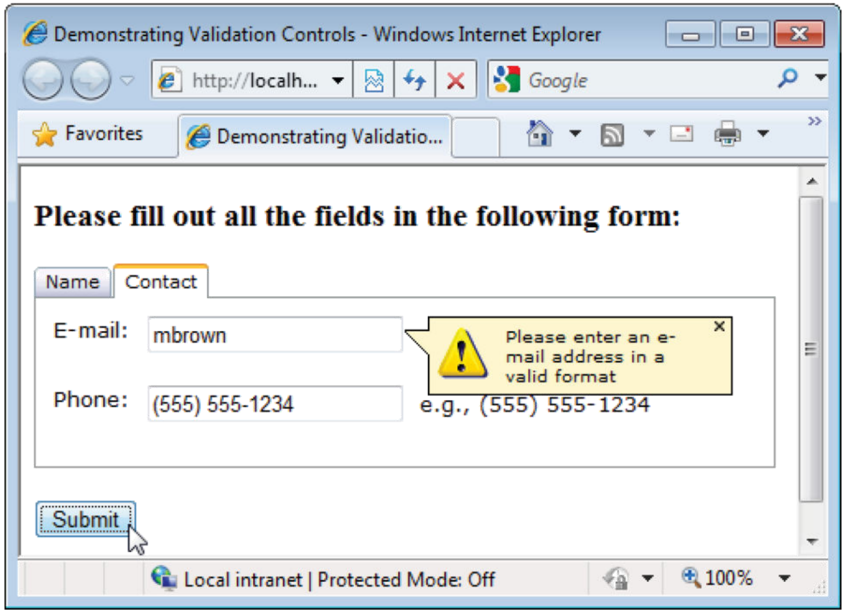
Name | Contact

Name: Mike Brown

Submit

Fig. 22.21 | Validation application enhanced by ASP.NET Ajax. (Part 1 of 3.)

b) Entering an e-mail address in an incorrect format and pressing the *Tab* key to move to the next input field causes a callout to appear informing the user to enter an e-mail address in a valid format



Demonstrating Validation Controls - Windows Internet Explorer
http://localh...
Google
Favorites
Demonstrating Validatio...

**Please fill out all the fields in the following form:**

E-mail: mbrown

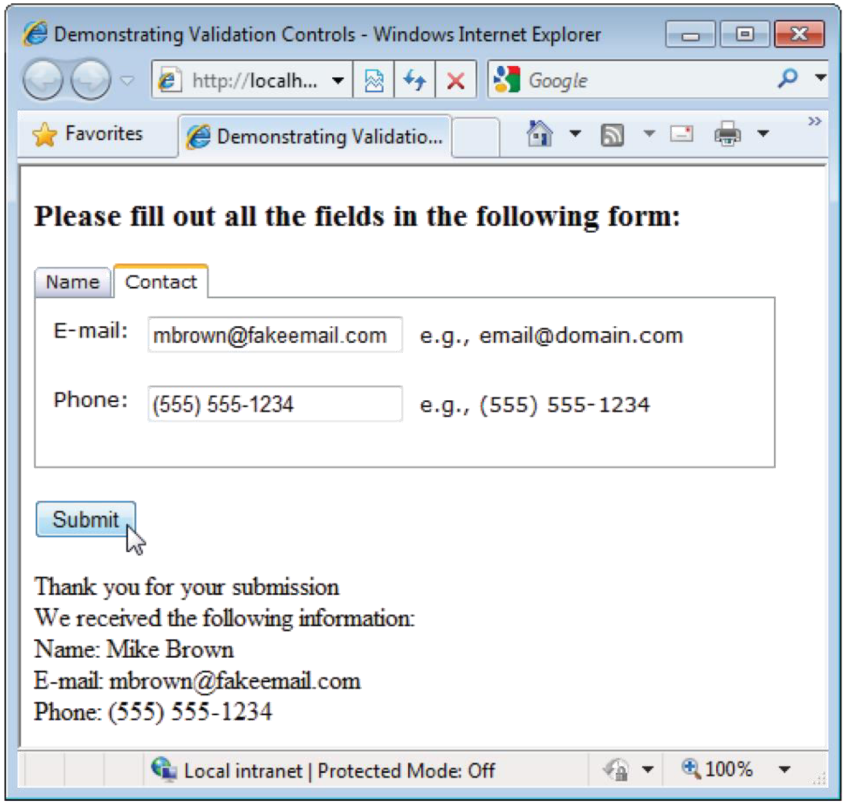
Please enter an e-mail address in a valid format

Phone: (555) 555-1234 e.g., (555) 555-1234

Submit
Local intranet | Protected Mode: Off
100%

Fig. 22.21 | Validation application enhanced by ASP.NET Ajax. (Part 2 of 3.)

c) After filling out the form properly and clicking the **Submit** button, the submitted data is displayed at the bottom of the page with a partial page update


Demonstrating Validation Controls - Windows Internet Explorer
http://localh...
Google
Favorites
Demonstrating Validatio...
Local intranet | Protected Mode: Off
100%

**Please fill out all the fields in the following form:**

Name | Contact

E-mail: mbrown@fakeemail.com e.g., email@domain.com

Phone: (555) 555-1234 e.g., (555) 555-1234

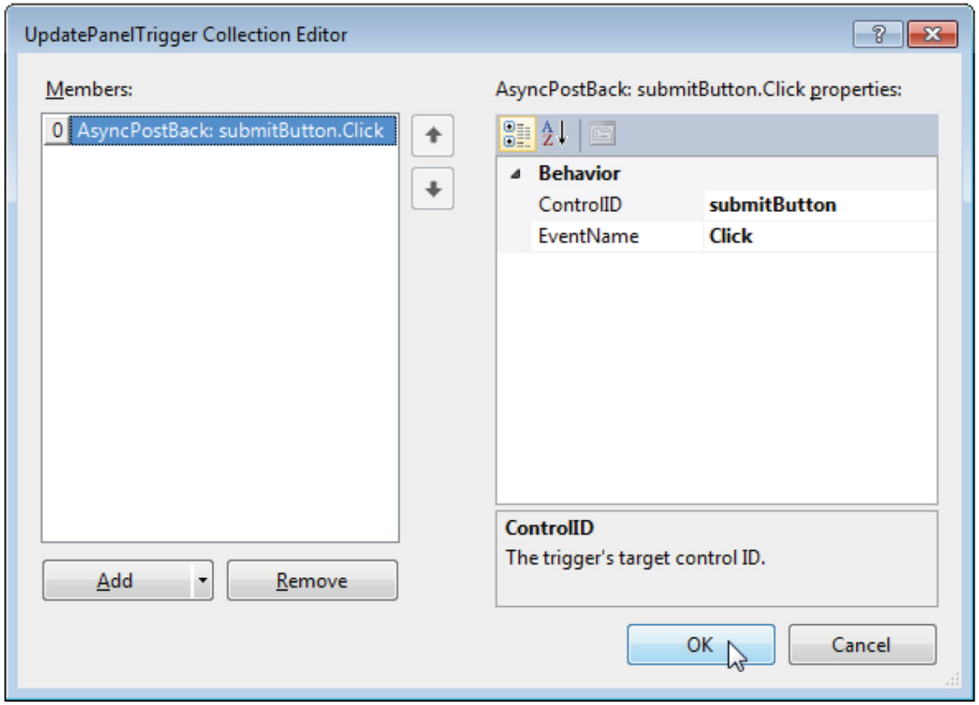
Submit

Thank you for your submission
We received the following information:
Name: Mike Brown
E-mail: mbrown@fakeemail.com
Phone: (555) 555-1234

**Fig. 22.21** | Validation application enhanced by ASP.NET Ajax. (Part 3 of 3.)

### Common Programming Error 22.1

Putting more than one `ScriptManager` and/or `ToolkitScriptManager` control on a Web Form causes the application to throw an `InvalidOperationException` when the page is initialized.



UpdatePanelTrigger Collection Editor

Members:

0 AsyncPostBack: submitButton.Click

AsyncPostBack: submitButton.Click properties:

Behavior

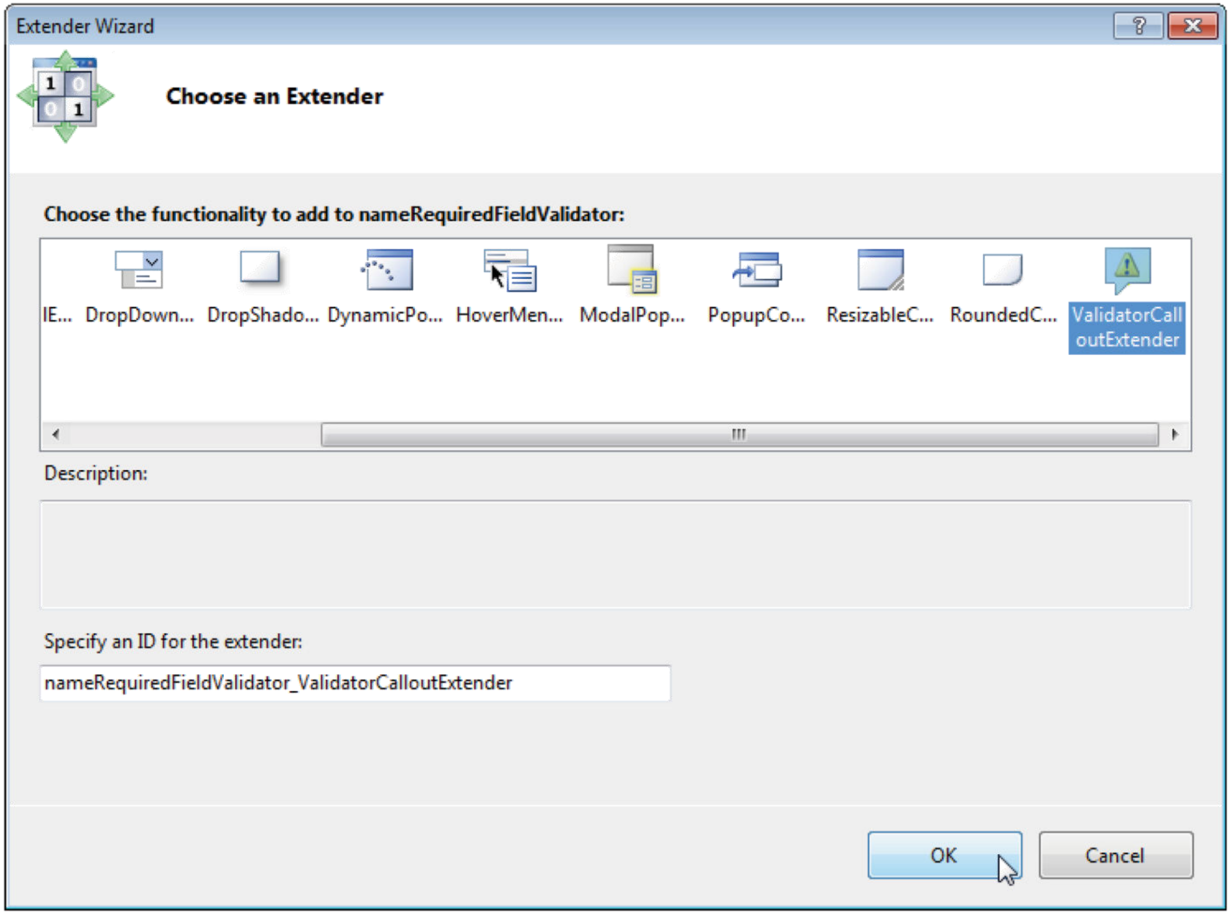
ControlID submitButton

EventName Click

ControlID

The trigger's target control ID.

Fig. 22.22 | Creating a trigger for an `UpdatePanel`.



Choose the functionality to add to nameRequiredFieldValidator:

Description:

Specify an ID for the extender: nameRequiredFieldValidator_ValidatorCalloutExtender

Fig. 22.23 | Creating a control extender using the **Extender Wizard**