Working with Data in ASP.NET 2.0 :: Examining the Events Associated with Inserting, Updating, and Deleting

Introduction

When using the built-in inserting, editing, or deleting features of the GridView, DetailsView, or FormView controls, a variety of steps transpire when the end user completes the process of adding a new record or updating or deleting an existing record. As we discussed in the previous tutorial, when a row is edited in the GridView the Edit button is replaced by Update and Cancel buttons and the BoundFields turn into TextBoxes. After the end user updates the data and clicks Update, the following steps are performed on postback:

1. The GridView populates its ObjectDataSource's `UpdateParameters` with the edited record's unique identifying field(s) (via the `DataKeyNames` property) along with the values entered by the user
2. The GridView invokes its ObjectDataSource's `Update()` method, which in turn invokes the appropriate method in the underlying object (`ProductsDAL.UpdateProduct`, in our previous tutorial)
3. The underlying data, which now includes the updated changes, is rebound to the GridView

During this sequence of steps, a number of events fire, enabling us to create event handlers to add custom logic where needed. For example, prior to Step 1, the GridView's `RowUpdating` event fires. We can, at this point, cancel the update request if there is some validation error. When the `Update()` method is invoked, the ObjectDataSource's `Updating` event fires, providing an opportunity to add or customize the values of any of the `UpdateParameters`. After the ObjectDataSource's underlying object's method has completed executing, the ObjectDataSource's `Updated` event is raised. An event handler for the `Updated` event can inspect the details about the update operation, such as how many rows were affected and whether or not an exception occurred. Finally, after Step 2, the GridView's `RowUpdated` event fires; an event handler for this event can examine additional information about the update operation just performed.

Figure 1 depicts this series of events and steps when updating a GridView. The event pattern in Figure 1 is not unique to updating with a GridView. Inserting, updating, or deleting data from the GridView, DetailsView, or FormView precipitates the same sequence of pre- and post-level events for both the data Web control and the ObjectDataSource.

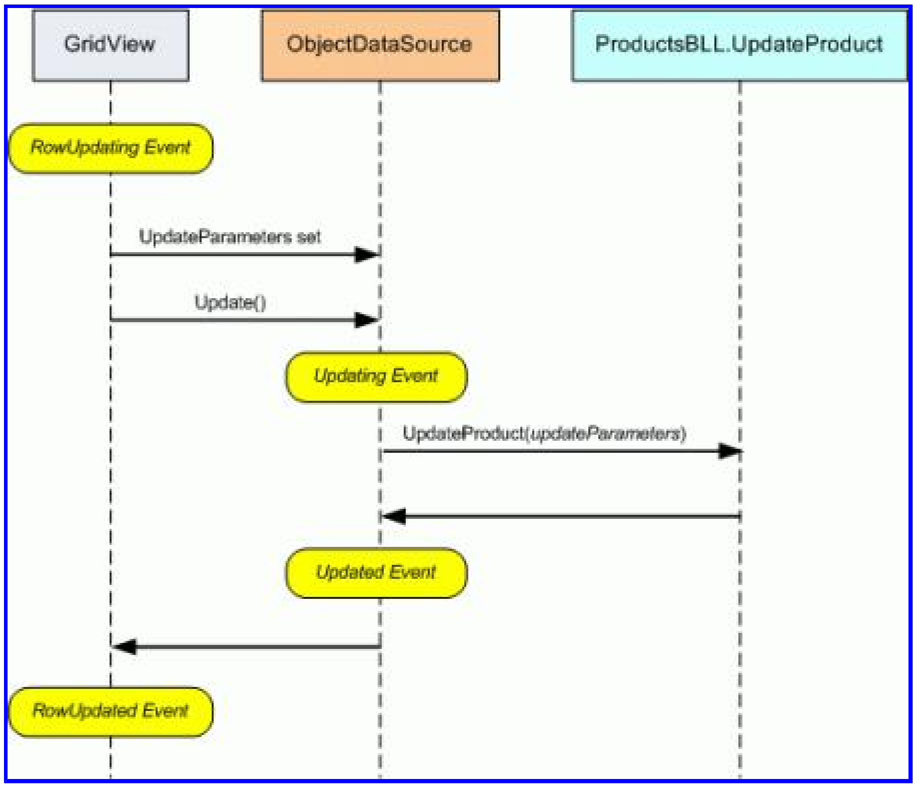


Figure 1: A Series of Pre- and Post-Events Fire When Updating Data in a GridView

In this tutorial we'll examine using these events to extend the built-in inserting, updating, and deleting capabilities of the ASP.NET data Web controls. We'll also see how to customize the editing interface to only update a subset of the product fields.

Step 1: Updating a Product's `ProductName` and `UnitPrice` Fields

In the editing interfaces from the previous tutorial *all* product fields that were not read-only had to be included. If we were to remove a field from the GridView - say `QuantityPerUnit` - when updating the data the data Web control would not set the ObjectDataSource's `QuantityPerUnit` `UpdateParameters` value. The ObjectDataSource would then pass in a `null` value into the `UpdateProduct` Business Logic Layer (BLL) method, which would change the edited database record's `QuantityPerUnit` column to a `NULL` value. Similarly, if a required field, such as `ProductName`, is removed from the editing interface, the update will fail with a "*Column 'ProductName' does not allow nulls*" exception. The reason for this behavior was because the ObjectDataSource was configured to call the `ProductsBLL` class's `UpdateProduct` method, which expected an input parameter for each of the product fields. Therefore, the ObjectDataSource's `UpdateParameters` collection contained a parameter for each of the method's input parameters.

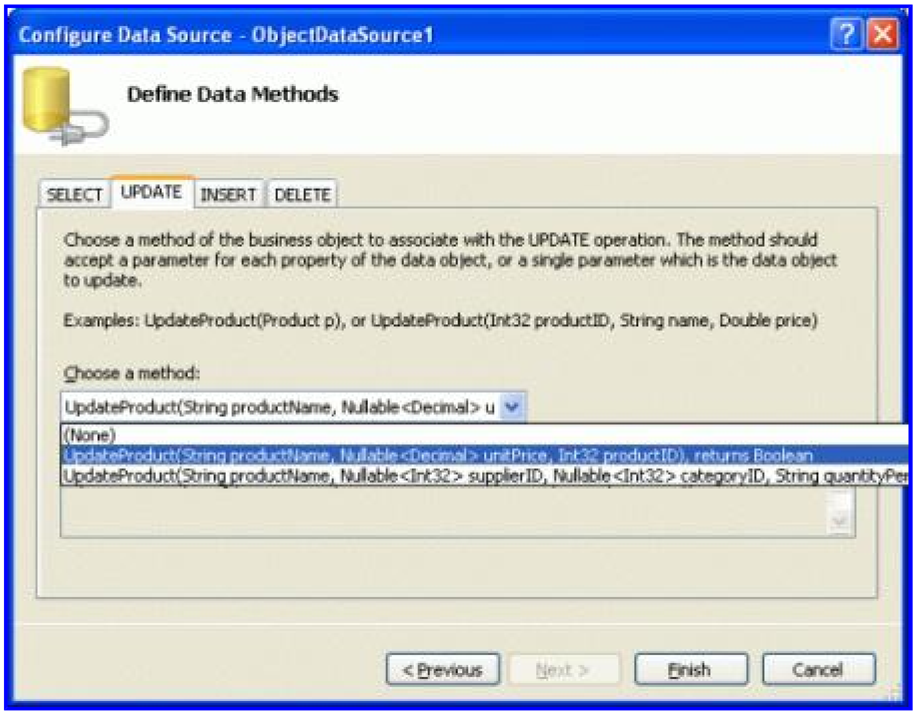
If we want to provide a data Web control that allows the end user to only update a subset of fields, then we need to either programmatically set the missing `UpdateParameters` values in the ObjectDataSource's `Updating` event handler or create and call a BLL method that expects only a subset of the fields. Let's explore this latter approach.

Specifically, let's create a page that displays just the `ProductName` and `UnitPrice` fields in an editable GridView. This GridView's editing interface will only allow the user to update the two displayed fields, ProductName and UnitPrice. Since this editing interface only provides a subset of a product's fields, we either need to create an ObjectDataSource that uses the existing BLL's UpdateProduct method and has the missing product field values set programmatically in its Updating event handler, or we need to create a new BLL method that expects only the subset of fields defined in the GridView. For this tutorial, let's use the latter option and create an overload of the UpdateProduct method, one that takes in just three input parameters: productName, unitPrice, and productID:

```
[System.ComponentModel.DataObjectMethodAttribute
    (System.ComponentModel.DataObjectMethodType.Update, false)]
public bool UpdateProduct(string productName, decimal? unitPrice, int productID)
{
    Northwind.ProductsDataTable products = Adapter.GetProductByProductID(productID);
    if (products.Count == 0)
        // no matching record found, return false
        return false;

    Northwind.ProductsRow product = products[0];

    product.ProductName = productName;
    if (unitPrice == null) product.SetUnitPriceNull();
      else product.UnitPrice = unitPrice.Value;

    // Update the product record
    int rowsAffected = Adapter.Update(product);

    // Return true if precisely one row was updated, otherwise false
    return rowsAffected == 1;
}
```

Like the original UpdateProduct method, this overload starts by checking to see if there is a product in the database with the specified ProductID. If not, it returns false, indicating that the request to update the product information failed. Otherwise it updates the existing product record's ProductName and UnitPrice fields accordingly and commits the update by calling the TableAdpater's Update() method, passing in the ProductsRow instance.

With this addition to our ProductsBLL class, we're ready to create the simplified GridView interface. Open the DataModificationEvents.aspx in the EditInsertDelete folder and add a GridView to the page. Create a new ObjectDataSource and configure it to use the ProductsBLL class with its Select() method mapping to GetProducts and its Update() method mapping to the UpdateProduct overload that takes in only the productName, unitPrice, and productID input parameters. Figure 2 shows the Create Data Source wizard when mapping the ObjectDataSource's Update() method to the ProductsBLL class's new UpdateProduct method overload.


Configure Data Source - ObjectDataSource1

Define Data Methods

Choose a method of the business object to associate with the UPDATE operation. The method should accept a parameter for each property of the data object, or a single parameter which is the data object to update.

Examples: UpdateProduct(Product p), or UpdateProduct(Int32 productID, String name, Double price)

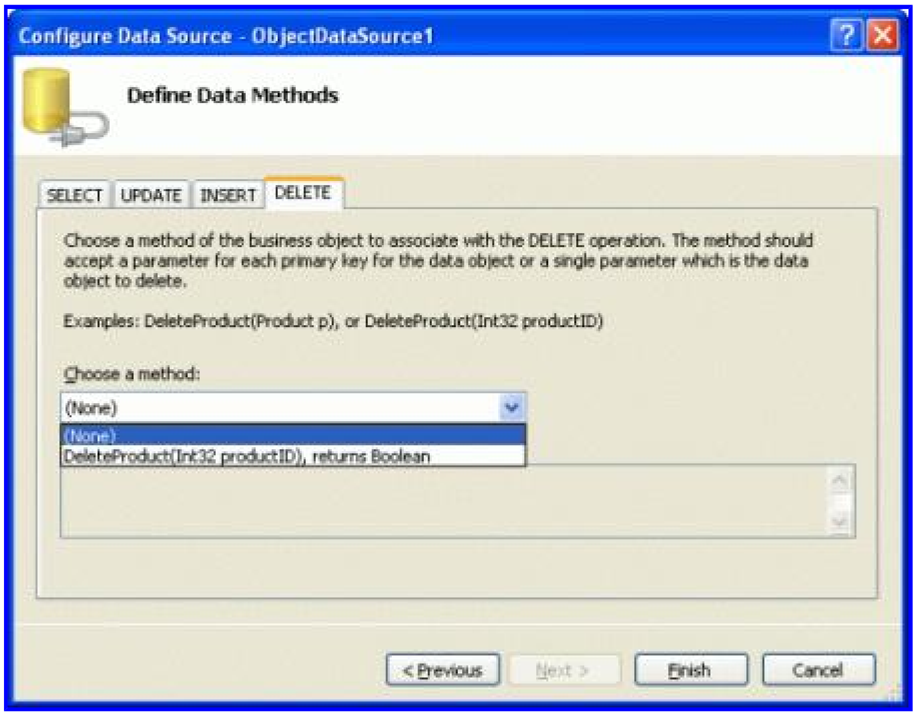
Choose a method:

UpdateProduct(String productName, Nullable<Decimal> u

(None)
UpdateProduct(String productName, Nullable<Decimal> unitPrice, Int32 productID), returns Boolean
UpdateProduct(String productName, Nullable<Int32> supplierID, Nullable<Int32> categoryID, String quantityPer

Figure 2: Map the ObjectDataSource's `Update()` Method to the New `UpdateProduct` Overload

Since our example will initially just need the ability to edit data, but not to insert or delete records, take a moment to explicitly indicate that the ObjectDataSource's `Insert()` and `Delete()` methods shouldn't be mapped to any of the `ProductsBLL` class's methods by going to the INSERT and DELETE tabs and choosing (None) from the drop-down list.


Configure Data Source - ObjectDataSource1

Define Data Methods

Choose a method of the business object to associate with the DELETE operation. The method should accept a parameter for each primary key for the data object or a single parameter which is the data object to delete.

Examples: DeleteProduct(Product p), or DeleteProduct(Int32 productID)

Choose a method:

(None)

(None)
DeleteProduct(Int32 productID), returns Boolean

Figure 3: Choose (None) From the Drop-Down List for the INSERT and DELETE Tabs

After completing this wizard check the Enable Editing checkbox from the GridView's smart tag.

With the completion of the Create Data Source wizard and binding that to the GridView, Visual Studio has created the declarative syntax for both controls. Go to the Source view to inspect the ObjectDataSource's declarative markup, which is shown below:

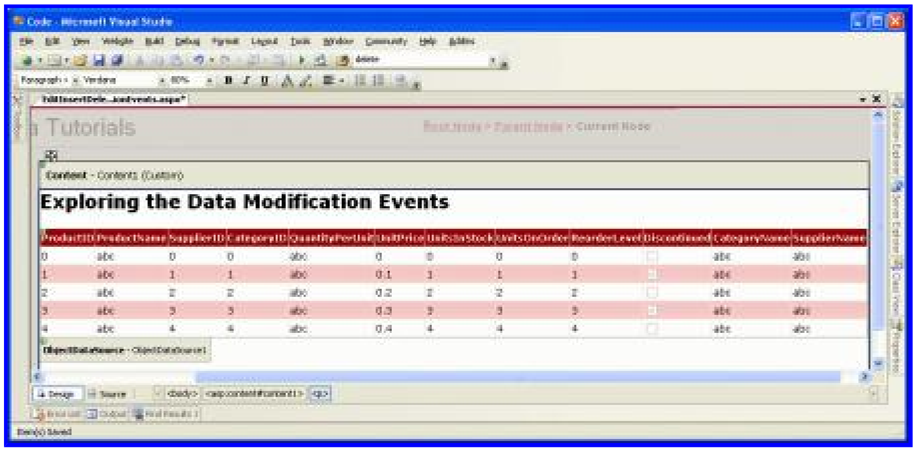
```
<asp:ObjectDataSource ID="ObjectDataSource1" runat="server"
    OldValuesParameterFormatString="original_{0}" SelectMethod="GetProducts"
    TypeName="ProductsBLL" UpdateMethod="UpdateProduct">
    <UpdateParameters>
        <asp:Parameter Name="productName" Type="String" />
        <asp:Parameter Name="unitPrice" Type="Decimal" />
        <asp:Parameter Name="productID" Type="Int32" />
    </UpdateParameters>
</asp:ObjectDataSource>
```

Since there are no mappings for the ObjectDataSource's `Insert()` and `Delete()` methods, there are no `InsertParameters` or `DeleteParameters` sections. Furthermore, since the `Update()` method is mapped to the `UpdateProduct` method overload that only accepts three input parameters, the `UpdateParameters` section has just three `Parameter` instances.

Note that the ObjectDataSource's `OldValuesParameterFormatString` property is set to `original_{0}`. This property is set automatically by Visual Studio when using the Configure Data Source wizard. However, since our BLL methods don't expect the original `ProductID` value to be passed in, remove this property assignment altogether from the ObjectDataSource's declarative syntax.

Note: If you simply clear out the `OldValuesParameterFormatString` property value from the Properties window in the Design view, the property will still exist in the declarative syntax, but will be set to an empty string. Either remove the property altogether from the declarative syntax or, from the Properties window, set the value to the default, `{0}`.

While the ObjectDataSource only has `UpdateParameters` for the product's name, price, and ID, Visual Studio has added a BoundField or CheckBoxField in the GridView for each of the product's fields.



Exploring the Data Modification Events

ProductID	ProductName	SupplierID	CategoryID	QuantityPerUnit	UnitPrice	UnitsInStock	UnitsOnOrder	ReorderLevel	Discontinued	CategoryName	SupplierName
0	abc	0	0	abc	0	0	0	0	☐	abc	abc
1	abc	1	1	abc	0.1	1	1	1	☐	abc	abc
2	abc	2	2	abc	0.2	2	2	2	☐	abc	abc
3	abc	3	3	abc	0.3	3	3	3	☐	abc	abc
4	abc	4	4	abc	0.4	4	4	4	☐	abc	abc

Figure 4: The GridView Contains a BoundField or CheckBoxField for Each of the Product's Fields

When the end user edits a product and clicks its Update button, the GridView enumerates those fields that were not read-only. It then sets the value of the corresponding parameter in the ObjectDataSource's `UpdateParameters` collection to the value entered by the user. If there is not a corresponding parameter, the GridView adds one to the collection. Therefore, if our GridView contains BoundFields and CheckBoxFields for all of the product's fields, the ObjectDataSource will end up invoking the `UpdateProduct` overload that takes in all of these parameters, despite the fact that the ObjectDataSource's declarative markup specifies only three input parameters (see Figure 5). Similarly, if there is some combination of non-read-only product fields in the GridView that doesn't correspond to the input parameters for a `UpdateProduct` overload, an exception will be raised when attempting to update.

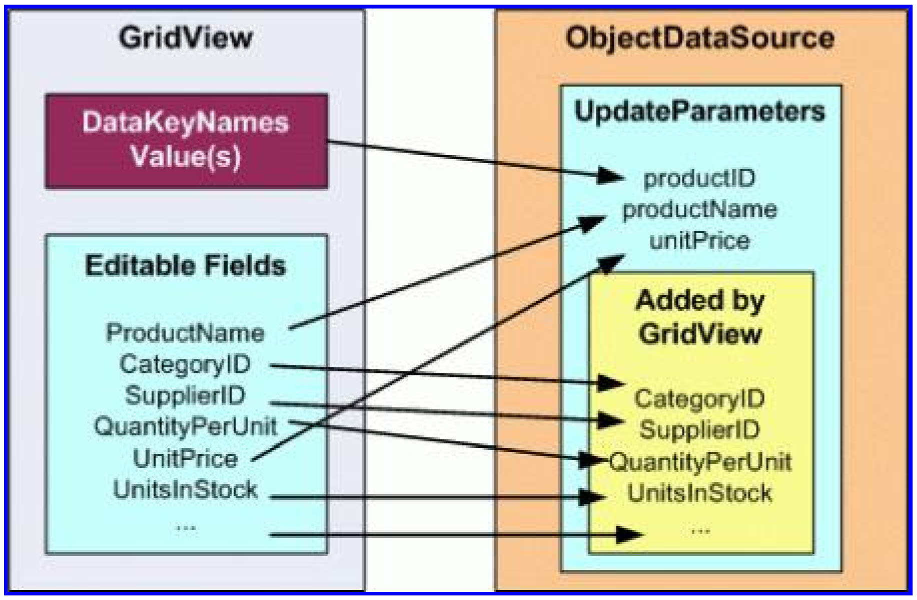


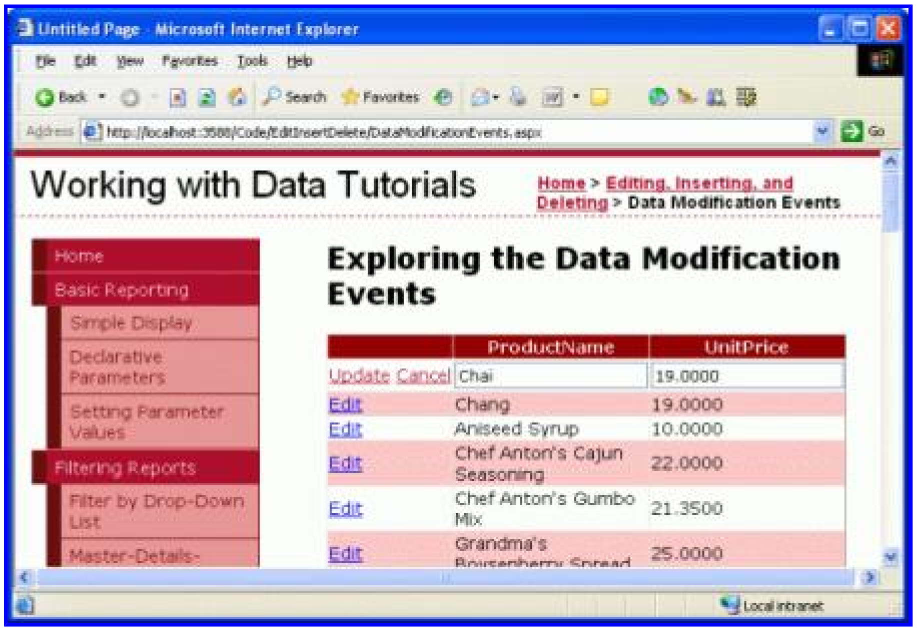
Figure 5: The GridView Will Add Parameters to the ObjectDataSource's `UpdateParameters` Collection

To ensure that the ObjectDataSource invokes the `UpdateProduct` overload that takes in just the product's name, price, and ID, we need to restrict the GridView to having editable fields for just the `ProductName` and `UnitPrice`. This can be accomplished by removing the other BoundFields and CheckBoxFields, by setting those other fields' `ReadOnly` property to `true`, or by some combination of the two. For this tutorial let's simply remove all GridView fields except the `ProductName` and `UnitPrice` BoundFields, after which the GridView's declarative markup will look like:

```
<asp:GridView ID="GridView1" runat="server" AutoGenerateColumns="False"
    DataKeyNames="ProductID" DataSourceID="ObjectDataSource1"
    EnableViewState="False">
    <Columns>
        <asp:CommandField ShowEditButton="True" />
        <asp:BoundField DataField="ProductName"
          HeaderText="ProductName" SortExpression="ProductName" />
        <asp:BoundField DataField="UnitPrice" HeaderText="UnitPrice"
          SortExpression="UnitPrice" />
    </Columns>
</asp:GridView>
```

Even though the `UpdateProduct` overload expects three input parameters, we only have two BoundFields in our GridView. This is because the `productID` input parameter is a primary key value and passed in through the value of the `DataKeyNames` property for the edited row.

Our GridView, along with the `UpdateProduct` overload, allows a user to edit just the name and price of a product without losing any of the other product fields.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Back Search Favorites
Address http://localhost:3588/Code/EditInsertDelete/DataModificationEvents.aspx
Go
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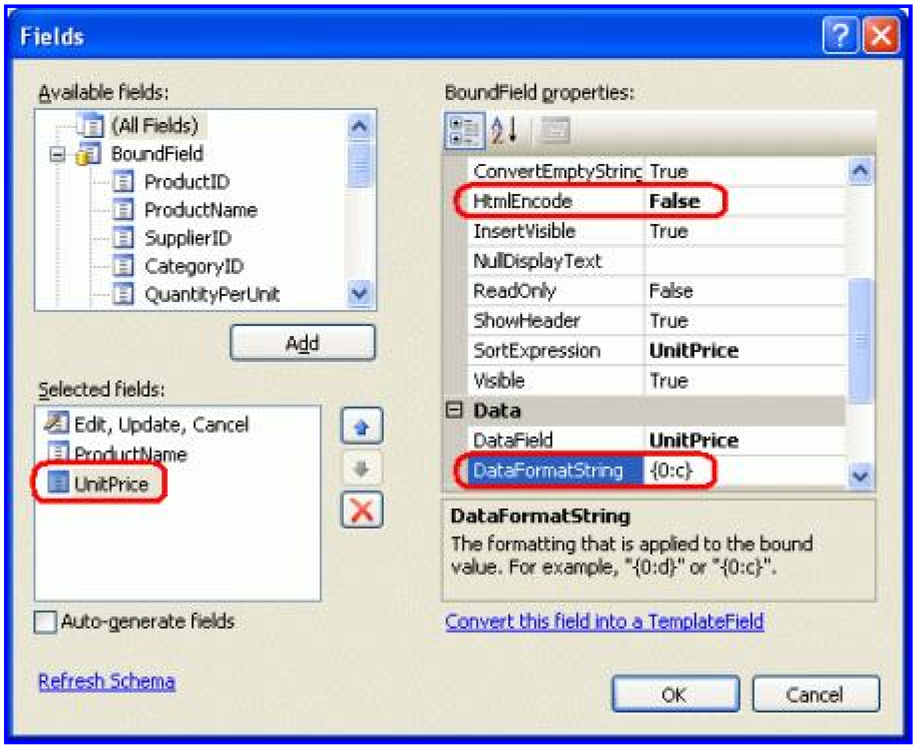
	ProductName	UnitPrice
Update Cancel	Chai	19.0000
Edit	Chang	19.0000
Edit	Aniseed Syrup	10.0000
Edit	Chef Anton's Cajun Seasoning	22.0000
Edit	Chef Anton's Gumbo Mix	21.3500
Edit	Grandma's Boysenberry Spread	25.0000

Figure 6: The Interface Allows Editing Just the Product's Name and Price

Improving the `UnitPrice` Formatting

While the GridView example shown in Figure 6 works, the `UnitPrice` field is not formatted at all, resulting in a price display that lacks any currency symbols and has four decimal places. To apply a currency formatting for the non-editable rows, simply set the `UnitPrice` BoundField's `DataFormatString` property to `{0:c}` and its `HtmlEncode` property to `false`.

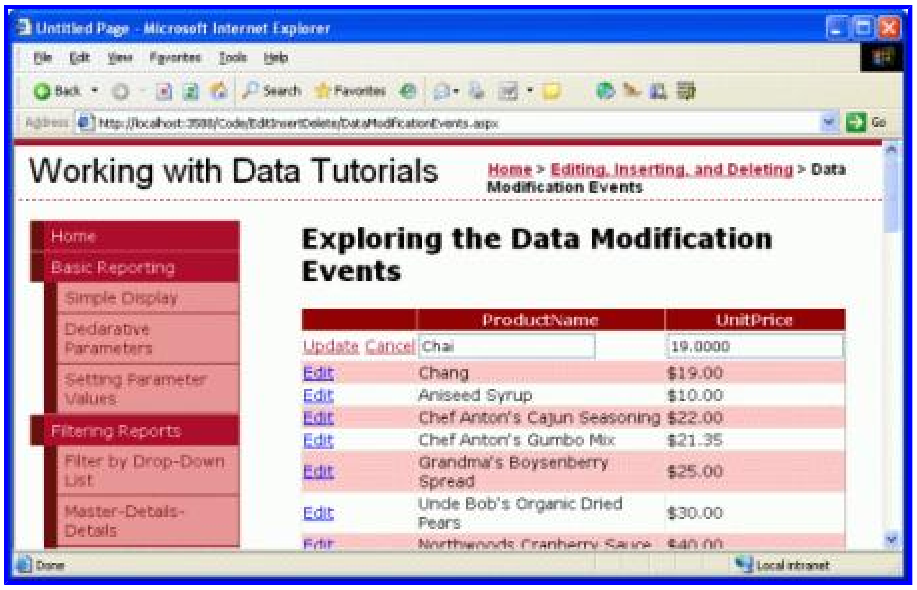


ConvertEmptyStrinc	True
HtmlEncode	**False**
InsertVisible	True
NullDisplayText	
ReadOnly	False
ShowHeader	True
SortExpression	**UnitPrice**
Visible	True
Data	
DataField	**UnitPrice**
DataFormatString	{0:c}

DataFormatString
The formatting that is applied to the bound value. For example, "{0:d}" or "{0:c}".

Figure 7: Set the `UnitPrice`'s `DataFormatString` and `HtmlEncode` Properties Accordingly

With this change, the non-editable rows format the price as a currency; the edited row, however, still displays the value without the currency symbol and with four decimal places.



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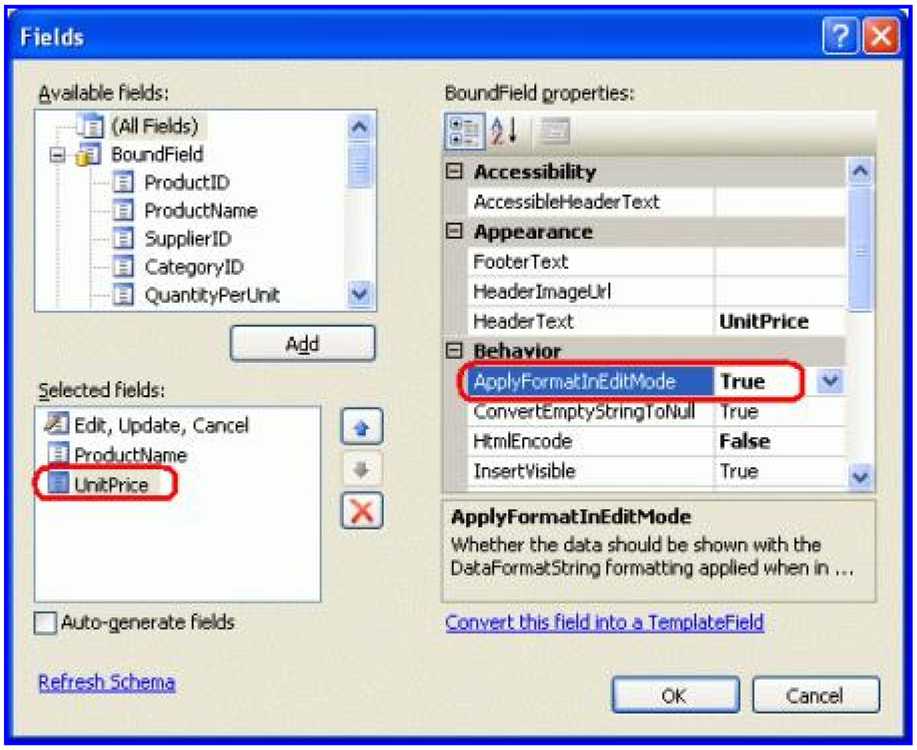
	ProductName	UnitPrice
Update Cancel	Chai	19.0000
Edit	Chang	$19.00
Edit	Aniseed Syrup	$10.00
Edit	Chef Anton's Cajun Seasoning	$22.00
Edit	Chef Anton's Gumbo Mix	$21.35
Edit	Grandma's Boysenberry Spread	$25.00
Edit	Uncle Bob's Organic Dried Pears	$30.00
Edit	Northwoods Cranberry Sauce	$40.00

Figure 8: The Non-Editable Rows are Now Formatted as Currency Values

The formatting instructions specified in the `DataFormatString` property can be applied to the editing interface by setting the BoundField's `ApplyFormatInEditMode` property to `true` (the default is `false`). Take a moment to set this property to `true`.

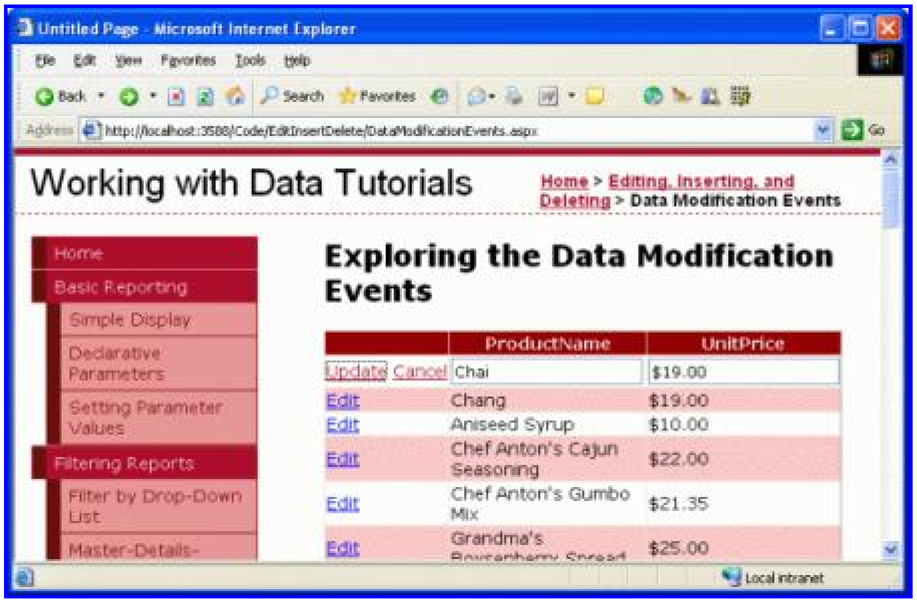


Accessibility	
AccessibleHeaderText	
Appearance	
FooterText	
HeaderImageUrl	
HeaderText	**UnitPrice**
Behavior	
ApplyFormatInEditMode	**True**
ConvertEmptyStringToNull	True
HtmlEncode	**False**
InsertVisible	True

ApplyFormatInEditMode
Whether the data should be shown with the DataFormatString formatting applied when in ...

Figure 9: Set the `UnitPrice` BoundField's `ApplyFormatInEditMode` property to `true`

With this change, the value of the `UnitPrice` displayed in the edited row is also formatted as a currency.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	ProductName	UnitPrice
Update Cancel	Chai	$19.00
Edit	Chang	$19.00
Edit	Aniseed Syrup	$10.00
Edit	Chef Anton's Cajun Seasoning	$22.00
Edit	Chef Anton's Gumbo Mix	$21.35
Edit	Grandma's Boysenberry Spread	$25.00

Figure 10: The Edited Row's `UnitPrice` Value is Now Formatted as a Currency

However, updating a product with the currency symbol in the textbox – such as $19.00 – throws a `FormatException`. When the GridView attempts to assign the user-supplied values to the ObjectDataSource's `UpdateParameters` collection it is unable to convert the `UnitPrice` string "$19.00" into the `decimal` required by the parameter (see Figure 11). To remedy this we can create an event handler for the GridView's `RowUpdating` event and have it parse the user-supplied `UnitPrice` as a currency-formatted `decimal`.

The GridView's `RowUpdating` event accepts as its second parameter an object of type GridViewUpdateEventArgs, which includes a `NewValues` dictionary as one of its properties that holds the user-supplied values ready to be assigned to the ObjectDataSource's `UpdateParameters` collection. We can overwrite the existing `UnitPrice` value in the `NewValues` collection with a decimal value parsed using the currency format with the following lines of code in the `RowUpdating` event handler:

```
protected void GridView1_RowUpdating(object sender, GridViewUpdateEventArgs e)
{
  if (e.NewValues["UnitPrice"] != null)
    e.NewValues["UnitPrice"] =
        decimal.Parse(e.NewValues["UnitPrice"].ToString(),
            System.Globalization.NumberStyles.Currency);
}
```

If the user has supplied a `UnitPrice` value (such as "$19.00"), this value is overwritten with the decimal value computed by Decimal.Parse, parsing the value as a currency. This will correctly parse the decimal in the event of any currency symbols, commas, decimal points, and so on, and uses the NumberStyles enumeration in the System.Globalization namespace.

Figure 11 shows both the problem caused by currency symbols in the user-supplied `UnitPrice`, along with how the GridView's `RowUpdating` event handler can be utilized to correctly parse such input.

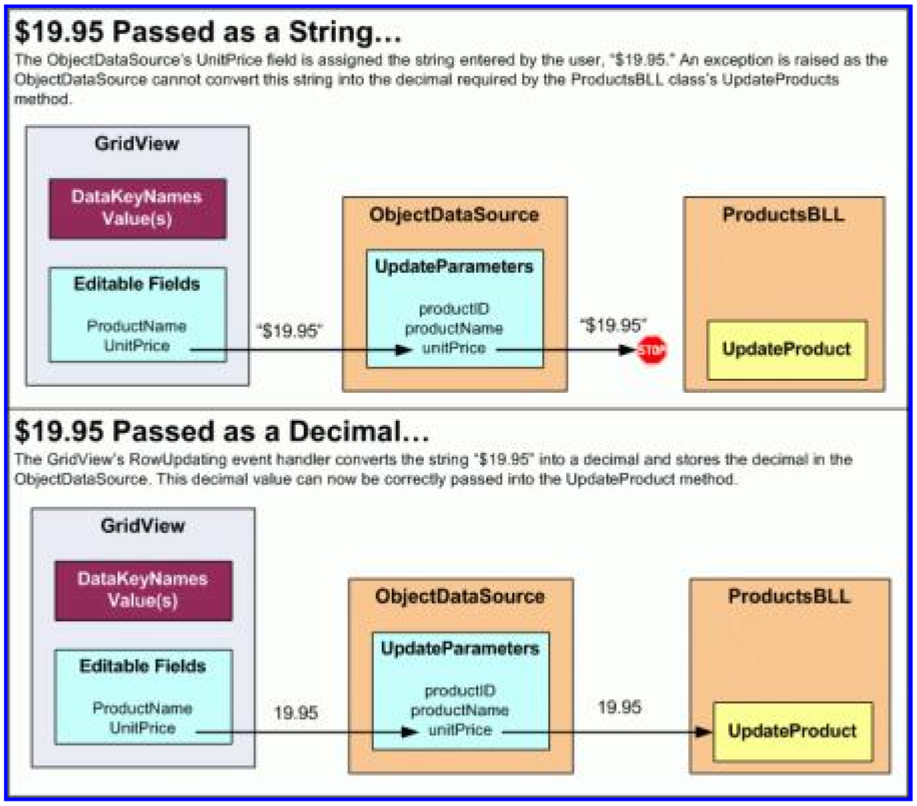

$19.95 Passed as a String...
The ObjectDataSource's UnitPrice field is assigned the string entered by the user, "$19.95." An exception is raised as the ObjectDataSource cannot convert this string into the decimal required by the ProductsBLL class's UpdateProducts method.
GridView
DataKeyNames Value(s)
Editable Fields
ProductName
UnitPrice
"$19.95"
ObjectDataSource
UpdateParameters
productID
productName
unitPrice
"$19.95"
STOP
ProductsBLL
UpdateProduct
$19.95 Passed as a Decimal...
The GridView's RowUpdating event handler converts the string "$19.95" into a decimal and stores the decimal in the ObjectDataSource. This decimal value can now be correctly passed into the UpdateProduct method.
GridView
DataKeyNames Value(s)
Editable Fields
ProductName
UnitPrice
19.95
ObjectDataSource
UpdateParameters
productID
productName
unitPrice
19.95
ProductsBLL
UpdateProduct

Figure 11: The Edited Row's `UnitPrice` Value is Now Formatted as a Currency

Step 2: Prohibiting `NULL UnitPrices`

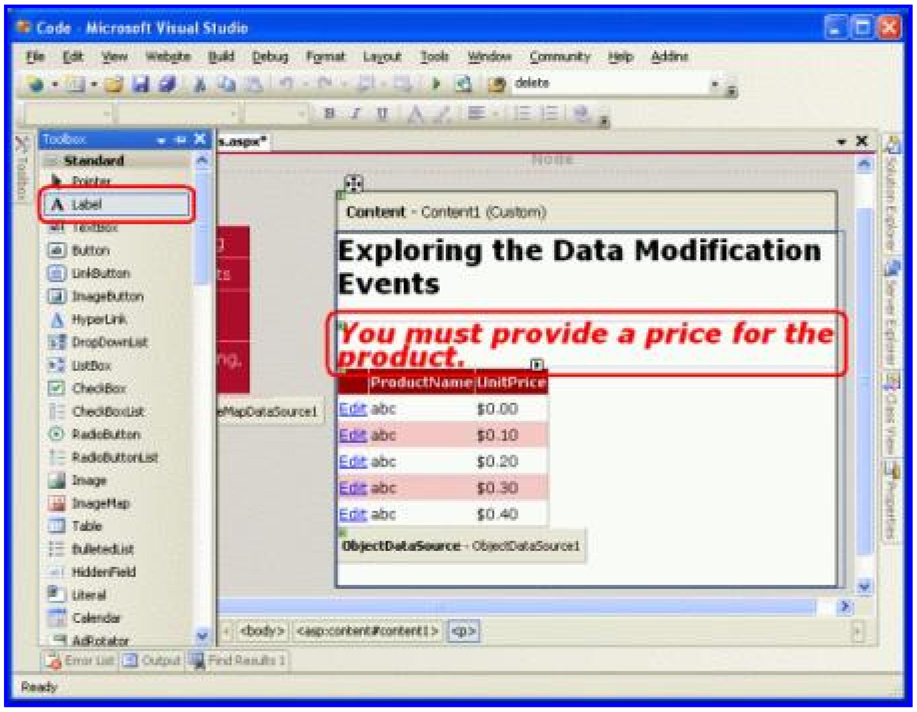
While the database is configured to allow `NULL` values in the `Products` table's `UnitPrice` column, we may want to prevent users visiting this particular page from specifying a `NULL UnitPrice` value. That is, if a user fails to enter a `UnitPrice` value when editing a product row, rather than save the results to the database we want to display a message informing the user that, through this page, any edited products must have a price specified.

The `GridViewUpdateEventArgs` object passed into the GridView's `RowUpdating` event handler contains a `Cancel` property that, if set to `true`, terminates the updating process. Let's extend the `RowUpdating` event handler to set `e.Cancel` to `true` and display a message explaining why if the `UnitPrice` value in the `NewValues` collection is `null`.

Start by adding a Label Web control to the page named `MustProvideUnitPriceMessage`. This Label control will be displayed if the user fails to specify a `UnitPrice` value when updating a product. Set the Label's `Text` property to "You must provide a price for the product." I've also created a new CSS class in `Styles.css` named `Warning` with the following definition:

```
.Warning
{
    color: Red;
    font-style: italic;
    font-weight: bold;
    font-size: x-large;
}
```

Finally, set the Label's `CssClass` property to `Warning`. At this point the Designer should show the warning message in a red, bold, italic, extra large font size above the GridView, as shown in Figure 12.



Exploring the Data Modification Events

You must provide a price for the product.

	ProductName	UnitPrice
Edit	abc	$0.00
Edit	abc	$0.10
Edit	abc	$0.20
Edit	abc	$0.30
Edit	abc	$0.40

Figure 12: A Label Has Been Added Above the GridView

By default, this Label should be hidden, so set its `Visible` property to `false` in the `Page_Load` event handler:

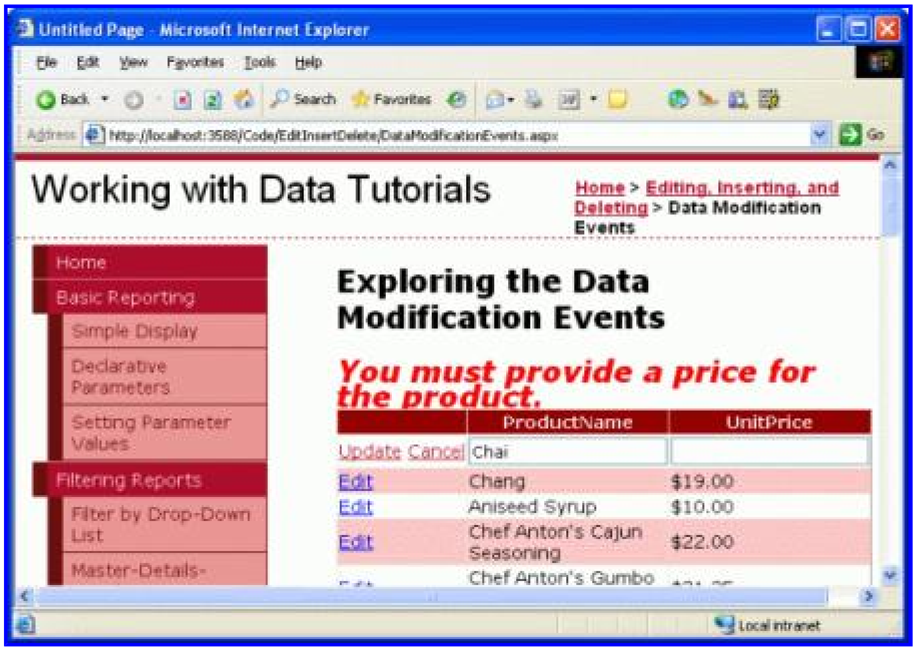
```
protected void Page_Load(object sender, EventArgs e)
{
    MustProvideUnitPriceMessage.Visible = false;
}
```

If the user attempts to update a product without specifying the `UnitPrice`, we want to cancel the update and display the warning label. Augment the GridView's `RowUpdating` event handler as follows:

```
protected void GridView1_RowUpdating(object sender, GridViewUpdateEventArgs e)
{
    if (e.NewValues["UnitPrice"] != null)
    {
        e.NewValues["UnitPrice"] =
            decimal.Parse(e.NewValues["UnitPrice"].ToString(),
                System.Globalization.NumberStyles.Currency);
    }
    else
    {
        // Show the Label
        MustProvideUnitPriceMessage.Visible = true;

        // Cancel the update
        e.Cancel = true;
    }
}
```

If a user attempts to save a product without specifying a price, the update is cancelled and a helpful message is displayed. While the database (and business logic) allows for `NULL` `UnitPrice`s, this particular ASP.NET page does not.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Back Search Favorites
Address http://localhost:3588/Code/EditInsertDelete/DataModificationEvents.aspx
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You must provide a price for the product.

	ProductName	UnitPrice
Update Cancel	Chai	
Edit	Chang	$19.00
Edit	Aniseed Syrup	$10.00
Edit	Chef Anton's Cajun Seasoning	$22.00
	Chef Anton's Gumbo	

Figure 13: A User Cannot Leave `UnitPrice` Blank

So far we have seen how to use the GridView's `RowUpdating` event to programmatically alter the parameter values assigned to the ObjectDataSource's `UpdateParameters` collection as well as how to cancel the updating process altogether. These concepts carry over to the DetailsView and FormView controls and also apply to inserting and deleting.

These tasks can also be done at the ObjectDataSource level through event handlers for its `Inserting`, `Updating`, and `Deleting` events. These events fire before the associated method of the underlying object is invoked and provide a last-chance opportunity to modify the input parameters collection or cancel the operation outright. The event handlers for these three events are passed an object of type ObjectDataSourceMethodEventArgs that has two properties of interest:

- Cancel, which, if set to `true`, cancels the operation being performed
- InputParameters, which is the collection of `InsertParameters`, `UpdateParameters`, or `DeleteParameters`, depending on whether the event handler is for the `Inserting`, `Updating`, or `Deleting` event

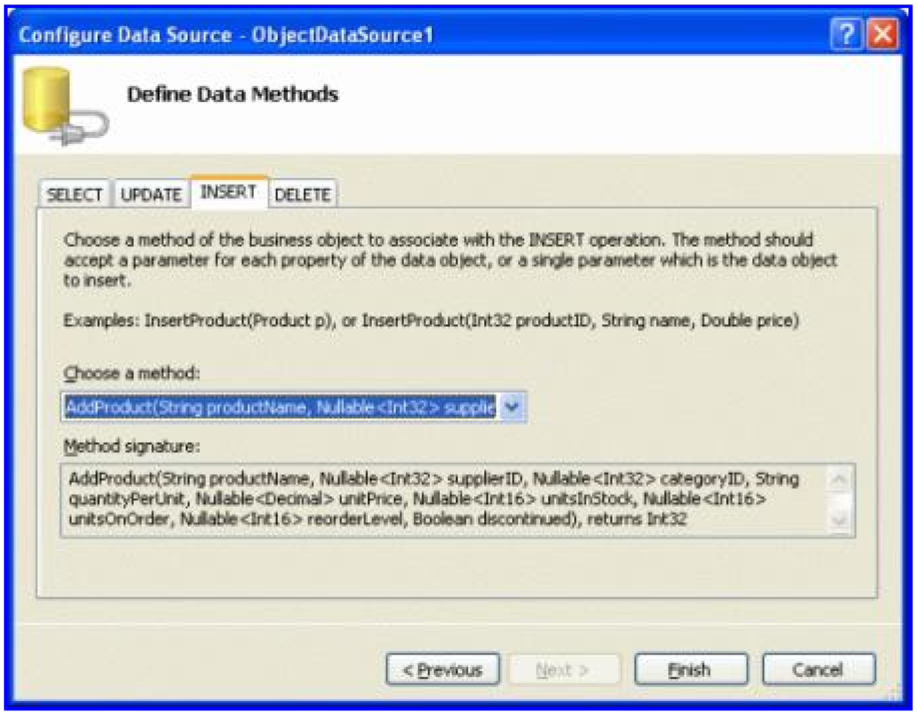
To illustrate working with the parameter values at the ObjectDataSource level, let's include a DetailsView in our page that allows the users to add a new product. This DetailsView will be used to provide an interface for quickly adding a new product to the database. To keep a consistent user interface when adding a new product let's allow the user to only enter values for the `ProductName` and `UnitPrice` fields. By default, those values that aren't supplied in the DetailsView's inserting interface will be set to a `NULL` database value. However, we can use the ObjectDataSource's `Inserting` event to inject different default values, as we'll see shortly.

Step 3: Providing an Interface to Add New Products

Drag a DetailsView from the Toolbox onto the Designer above the GridView, clear out its `Height` and `Width` properties, and bind it to the ObjectDataSource already present on the page. This will add a BoundField or CheckBoxField for each of the product's fields. Since we want to use this DetailsView to add new products, we need to check the Enable Inserting option from the smart tag; however, there's no such option because the ObjectDataSource's `Insert()` method is not mapped to a method in the `ProductsBLL` class (recall that we set this mapping to (None) when configuring the data source – see Figure 3).

To configure the ObjectDataSource, select the Configure Data Source link from its smart tag, launching the wizard. The first screen allows you to change the underlying object the ObjectDataSource is bound to; leave it set to `ProductsBLL`. The next screen lists the mappings from the ObjectDataSource's methods to the underlying object's. Even though we explicitly indicated that the `Insert()` and `Delete()` methods should not be mapped to any methods, if you go to the INSERT and DELETE tabs you'll see that a mapping is there. This is because the `ProductsBLL`'s `AddProduct` and `DeleteProduct` methods use the `DataObjectMethodAttribute` attribute to indicate that they are the default methods for `Insert()` and `Delete()`, respectively. Hence, the ObjectDataSource wizard selects these each time you run the wizard unless there's some other value explicitly specified.

Leave the `Insert()` method pointing to the `AddProduct` method, but again set the DELETE tab's drop-down list to (None).



Choose a method of the business object to associate with the INSERT operation. The method should accept a parameter for each property of the data object, or a single parameter which is the data object to insert.

Examples: InsertProduct(Product p), or InsertProduct(Int32 productID, String name, Double price)

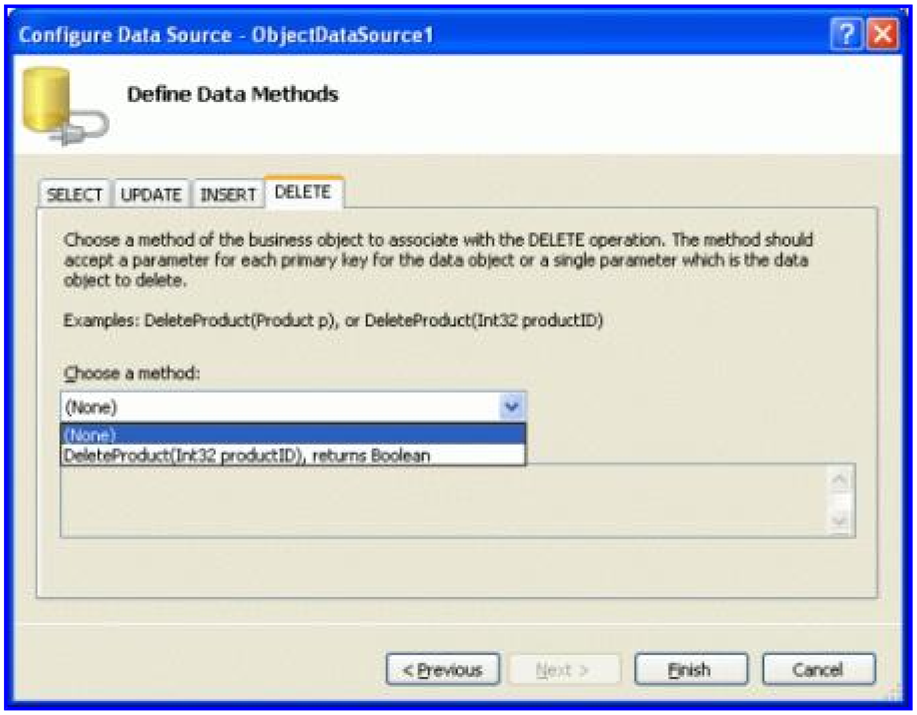
Choose a method:

AddProduct(String productName, Nullable<Int32> supplie

Method signature:

AddProduct(String productName, Nullable<Int32> supplierID, Nullable<Int32> categoryID, String quantityPerUnit, Nullable<Decimal> unitPrice, Nullable<Int16> unitsInStock, Nullable<Int16> unitsOnOrder, Nullable<Int16> reorderLevel, Boolean discontinued), returns Int32

Figure 14: Set the INSERT Tab's Drop-Down List to the `AddProduct` Method


Configure Data Source - ObjectDataSource1

Define Data Methods

Choose a method of the business object to associate with the DELETE operation. The method should accept a parameter for each primary key for the data object or a single parameter which is the data object to delete.

Examples: DeleteProduct(Product p), or DeleteProduct(Int32 productID)

Choose a method:

(None)

(None)
DeleteProduct(Int32 productID), returns Boolean

Figure 15: Set the DELETE Tab's Drop-Down List to (None)

After making these changes, the ObjectDataSource's declarative syntax will be expanded to include an `InsertParameters` collection, as shown below:

```
<asp:ObjectDataSource ID="ObjectDataSource1" runat="server"
    SelectMethod="GetProducts" TypeName="ProductsBLL"
    UpdateMethod="UpdateProduct" OnUpdating="ObjectDataSource1_Updating"
    InsertMethod="AddProduct" OldValuesParameterFormatString="original_{0}">
    <UpdateParameters>
        <asp:Parameter Name="productName" Type="String" />
        <asp:Parameter Name="unitPrice" Type="Decimal" />
        <asp:Parameter Name="productID" Type="Int32" />
    </UpdateParameters>
    <InsertParameters>
        <asp:Parameter Name="productName" Type="String" />
        <asp:Parameter Name="supplierID" Type="Int32" />
        <asp:Parameter Name="categoryID" Type="Int32" />
        <asp:Parameter Name="quantityPerUnit" Type="String" />
        <asp:Parameter Name="unitPrice" Type="Decimal" />
        <asp:Parameter Name="unitsInStock" Type="Int16" />
        <asp:Parameter Name="unitsOnOrder" Type="Int16" />
        <asp:Parameter Name="reorderLevel" Type="Int16" />
        <asp:Parameter Name="discontinued" Type="Boolean" />
    </InsertParameters>
</asp:ObjectDataSource>
```

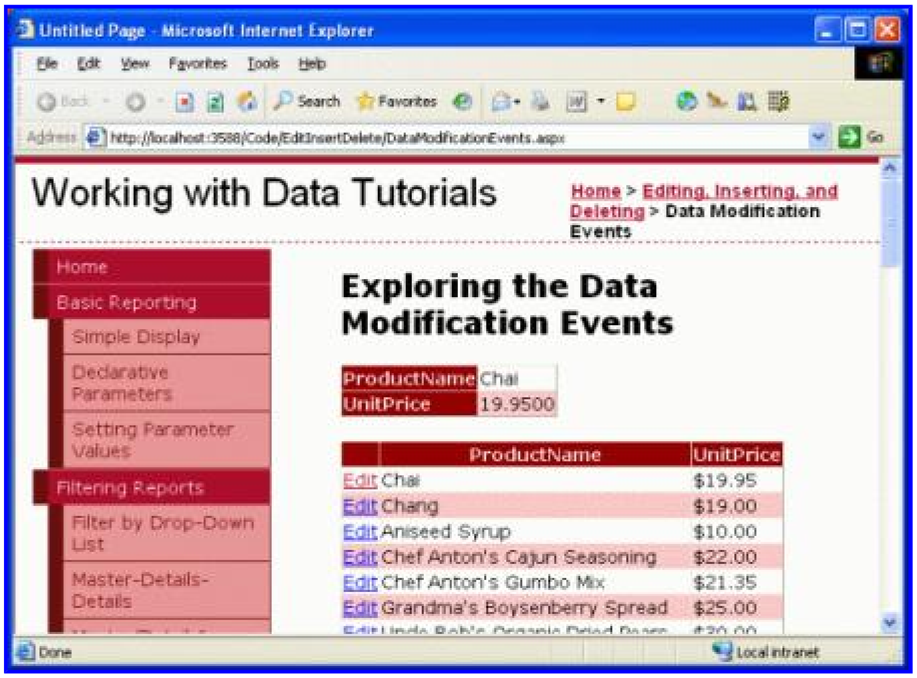
Rerunning the wizard added back the `OldValuesParameterFormatString` property. Take a moment to clear this property by setting it to the default value (`{0}`) or removing it altogether from the declarative syntax.

With the ObjectDataSource providing inserting capabilities, the DetailsView's smart tag will now include the Enable Inserting checkbox; return to the Designer and check this option. Next, pare down the DetailsView so that it only has two BoundFields - `ProductName` and `UnitPrice` - and the CommandField. At this point the DetailsView's declarative syntax should look like:

```
<asp:DetailsView ID="DetailsView1" runat="server" AutoGenerateRows="False"
```

```
    DataKeyNames="ProductID" DataSourceID="ObjectDataSource1"
    EnableViewState="False">
    <Fields>
        <asp:BoundField DataField="ProductName"
          HeaderText="ProductName" SortExpression="ProductName" />
        <asp:BoundField DataField="UnitPrice" HeaderText="UnitPrice"
          SortExpression="UnitPrice" />
        <asp:CommandField ShowInsertButton="True" />
    </Fields>
</asp:DetailsView>
```

Figure 16 shows this page when viewed through a browser at this point. As you can see, the DetailsView lists the name and price of the first product (Chai). What we want, however, is an inserting interface that provides a means for the user to quickly add a new product to the database.

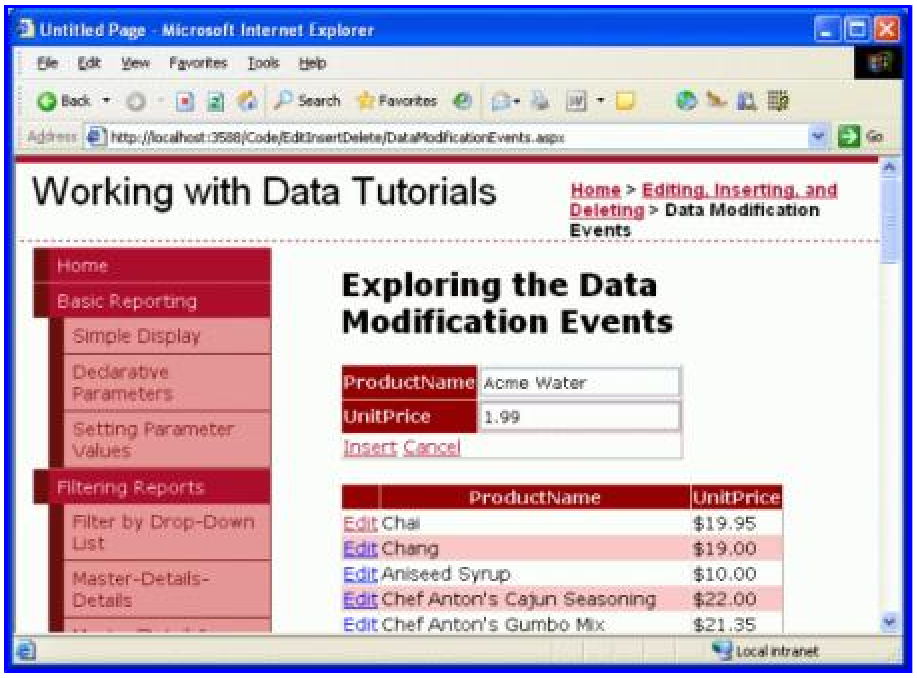

Untitled Page - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites
Address http://localhost:3588/Code/EditInsertDelete/DataModificationEvents.aspx
Go
Working with Data Tutorials
Home > Editing, Inserting, and Deleting > Data Modification Events
Home
Basic Reporting
Simple Display
Declarative Parameters
Setting Parameter Values
Filtering Reports
Filter by Drop-Down List
Master-Details-Details
Exploring the Data Modification Events
Done
Local intranet

ProductName	Chai
UnitPrice	19.9500

	ProductName	UnitPrice
Edit	Chai	$19.95
Edit	Chang	$19.00
Edit	Aniseed Syrup	$10.00
Edit	Chef Anton's Cajun Seasoning	$22.00
Edit	Chef Anton's Gumbo Mix	$21.35
Edit	Grandma's Boysenberry Spread	$25.00

Figure 16: The DetailsView is Currently Rendered in Read-Only Mode

In order to show the DetailsView in its inserting mode we need to set the `DefaultMode` property to `Inserting`. This renders the DetailsView in insert mode when first visited and keeps it there after inserting a new record. As Figure 17 shows, such a DetailsView provides a quick interface for adding a new record.


Untitled Page - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites
Address http://localhost:3588/Code/EditInsertDelete/DataModificationEvents.aspx Go
Working with Data Tutorials
Home > Editing, Inserting, and Deleting > Data Modification Events
Home
Basic Reporting
Simple Display
Declarative Parameters
Setting Parameter Values
Filtering Reports
Filter by Drop-Down List
Master-Details-Details
Local intranet

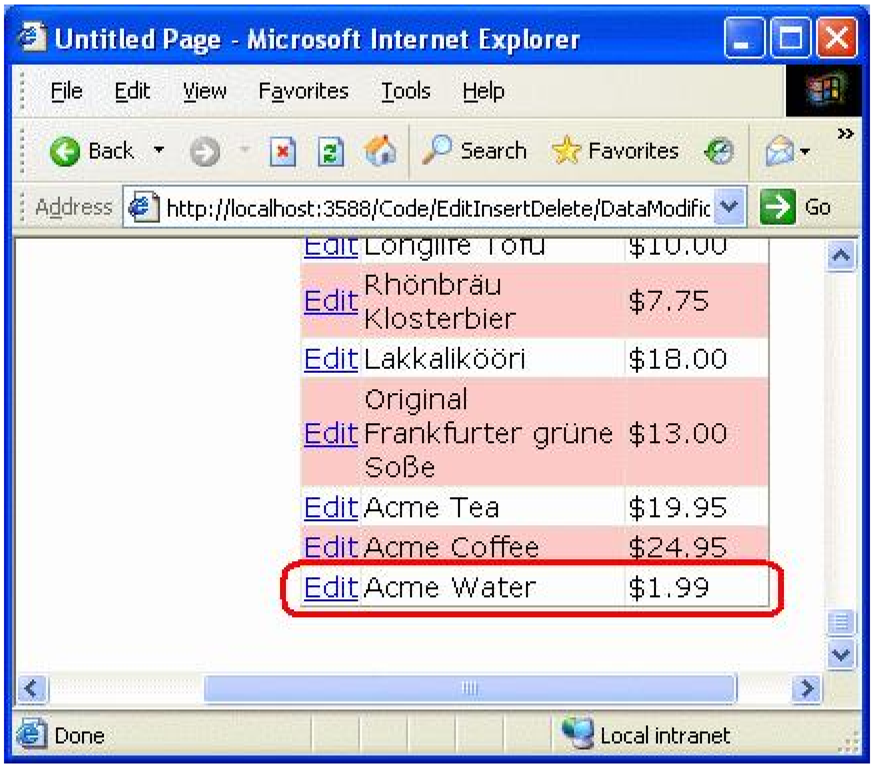
Exploring the Data Modification Events

ProductName	Acme Water
UnitPrice	1.99
Insert Cancel	

	ProductName	UnitPrice
Edit	Chai	$19.95
Edit	Chang	$19.00
Edit	Aniseed Syrup	$10.00
Edit	Chef Anton's Cajun Seasoning	$22.00
Edit	Chef Anton's Gumbo Mix	$21.35

Figure 17: The DetailsView Provides an Interface for Quickly Adding a New Product

When the user enters a product name and price (such as "Acme Water" and 1.99, as in Figure 17) and clicks Insert, a postback ensues and the inserting workflow commences, culminating in a new product record being added to the database. The DetailsView maintains its inserting interface and the GridView is automatically rebound to its data source in order to include the new product, as shown in Figure 18.


Untitled Page - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites
Address http://localhost:3588/Code/EditInsertDelete/DataModific Go
Done
Local intranet

Edit	Longlife Tofu	$10.00
Edit	Rhönbräu Klosterbier	$7.75
Edit	Lakkalikööri	$18.00
Edit	Original Frankfurter grüne Soße	$13.00
Edit	Acme Tea	$19.95
Edit	Acme Coffee	$24.95
Edit	Acme Water	$1.99

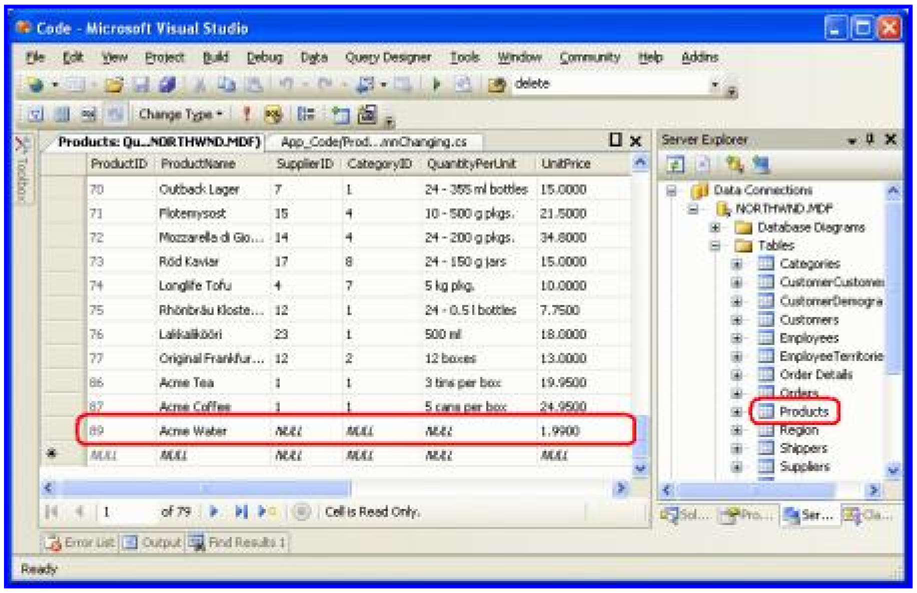
Figure 18: The Product "Acme Water" Has Been Added to the Database

While the GridView in Figure 18 doesn't show it, the product fields lacking from the DetailsView interface –

`CategoryID`, `SupplierID`, `QuantityPerUnit`, and so on – are assigned `NULL` database values. You can see this by performing the following steps:

1. Go to the Server Explorer in Visual Studio
2. Expanding the `NORTHWND.MDF` database node
3. Right-click on the `Products` database table node
4. Select Show Table Data

This will list all of the records in the `Products` table. As Figure 19 shows, all of our new product's columns other than `ProductID`, `ProductName`, and `UnitPrice` have `NULL` values.



ProductID	ProductName	SupplierID	CategoryID	QuantityPerUnit	UnitPrice
70	Outback Lager	7	1	24 - 355 ml bottles	15.0000
71	Flotemysost	15	4	10 - 500 g pkgs.	21.5000
72	Mozzarella di Gio...	14	4	24 - 200 g pkgs.	34.8000
73	Röd Kaviar	17	8	24 - 150 g jars	15.0000
74	Longlife Tofu	4	7	5 kg pkg.	10.0000
75	Rhönbräu Kloste...	12	1	24 - 0.5 l bottles	7.7500
76	Lakkalikööri	23	1	500 ml	18.0000
77	Original Frankfur...	12	2	12 boxes	13.0000
86	Acme Tea	1	1	3 tins per box	19.9500
87	Acme Coffee	1	1	5 cans per box	24.9500
89	Acme Water	NULL	NULL	NULL	1.9900
NULL	NULL	NULL	NULL	NULL	NULL

1 of 79 Cell is Read Only.

Figure 19: The Product Fields Not Provided in the DetailsView are Assigned `NULL` Values

We may want to provide a default value other than `NULL` for one or more of these column values, either because `NULL` isn't the best default option or because the database column itself doesn't allow `NULL`s. To accomplish this we can programmatically set the values of the parameters of the DetailsView's `InputParameters` collection. This assignment can be done either in the event handler for the DetailsView's `ItemInserting` event or the ObjectDataSource's `Inserting` event. Since we've already looked at using the pre- and post-level events at the data Web control level, let's explore using the ObjectDataSource's events this time.

Step 4: Assigning Values to the `CategoryID` and `SupplierID` Parameters

For this tutorial let's imagine that for our application when adding a new product through this interface it should be assigned a `CategoryID` and `SupplierID` value of 1. As mentioned earlier, the ObjectDataSource has a pair of pre- and post-level events that fire during the data modification process. When its `Insert()` method is invoked, the ObjectDataSource first raises its `Inserting` event, then calls the method that its `Insert()` method has been mapped to, and finally raises the `Inserted` event. The `Inserting` event handler affords us one last opportunity to tweak the input parameters or cancel the operation outright.

Note: In a real-world application you would likely want to either let the user specify the category and supplier or would pick this value for them based on some criteria or business logic (rather than blindly selecting an ID of 1). Regardless, the example illustrates how to programmatically set the value of an input parameter from the

ObjectDataSource's pre-level event.

Take a moment to create an event handler for the ObjectDataSource's `Inserting` event. Notice that the event handler's second input parameter is an object of type `ObjectDataSourceMethodEventArgs`, which has a property to access the parameters collection (`InputParameters`) and a property to cancel the operation (`Cancel`).

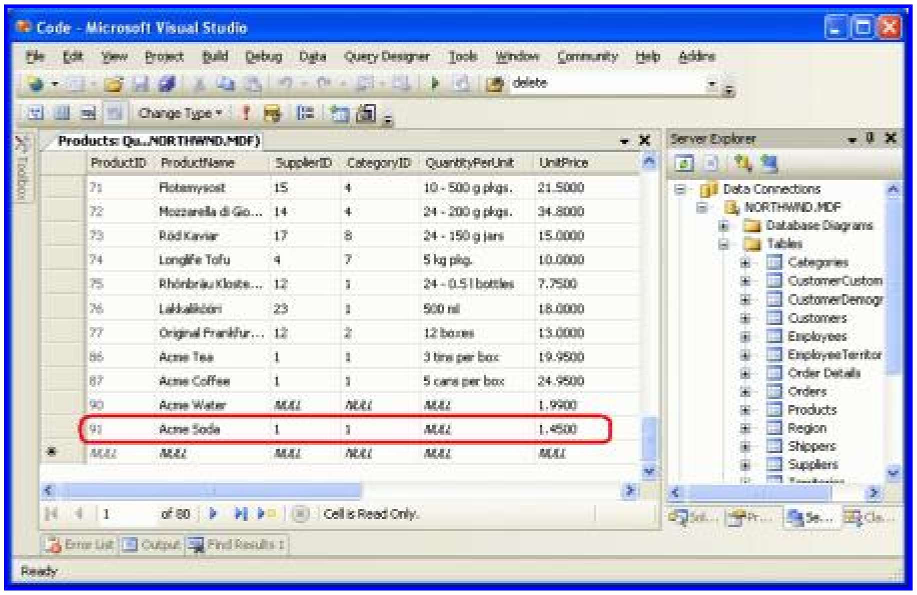
```
protected void ObjectDataSource1_Inserting
    (object sender, ObjectDataSourceMethodEventArgs e)
{

}
```

At this point, the `InputParameters` property contains the ObjectDataSource's `InsertParameters` collection with the values assigned from the DetailsView. To change the value of one of these parameters, simply use: `e.InputParameters["`*`paramName`*`"] = `*`value`*. Therefore, to set the `CategoryID` and `SupplierID` to values of 1, adjust the `Inserting` event handler to look like the following:

```
protected void ObjectDataSource1_Inserting
    (object sender, ObjectDataSourceMethodEventArgs e)
{
    e.InputParameters["CategoryID"] = 1;
    e.InputParameters["SupplierID"] = 1;
}
```

This time when adding a new product (such as Acme Soda), the `CategoryID` and `SupplierID` columns of the new product are set to 1 (see Figure 20).



	ProductID	ProductName	SupplierID	CategoryID	QuantityPerUnit	UnitPrice
	71	Flotemysost	15	4	10 - 500 g pkgs.	21.5000
	72	Mozzarella di Gio...	14	4	24 - 200 g pkgs.	34.8000
	73	Röd Kaviar	17	8	24 - 150 g jars	15.0000
	74	Longlife Tofu	4	7	5 kg pkg.	10.0000
	75	Rhönbräu Kloste...	12	1	24 - 0.5 l bottles	7.7500
	76	Lakkalikööri	23	1	500 ml	18.0000
	77	Original Frankfur...	12	2	12 boxes	13.0000
	86	Acme Tea	1	1	3 tins per box	19.9500
	87	Acme Coffee	1	1	5 cans per box	24.9500
	90	Acme Water	NULL	NULL	NULL	1.9900
	91	Acme Soda	1	1	NULL	1.4500
*	NULL	NULL	NULL	NULL	NULL	NULL

1 of 80 Cell is Read Only.

Figure 20: New Products Now Have Their `CategoryID` and `SupplierID` Values Set to 1

Summary

During the editing, inserting, and deleting process, both the data Web control and the ObjectDataSource proceed through a number of pre- and post-level events. In this tutorial we examined the pre-level events and saw how to use these to customize the input parameters or cancel the data modification operation altogether both from the data Web control and ObjectDataSource's events. In the next tutorial we'll look at creating and using event handlers for the post-level events.

Happy Programming!

About the Author

Scott Mitchell, author of six ASP/ASP.NET books and founder of 4GuysFromRolla.com, has been working with Microsoft Web technologies since 1998. Scott works as an independent consultant, trainer, and writer, recently completing his latest book, Sams Teach Yourself ASP.NET 2.0 in 24 Hours. He can be reached at mitchell@4guysfromrolla.com or via his blog, which can be found at http://ScottOnWriting.NET.

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