

2011

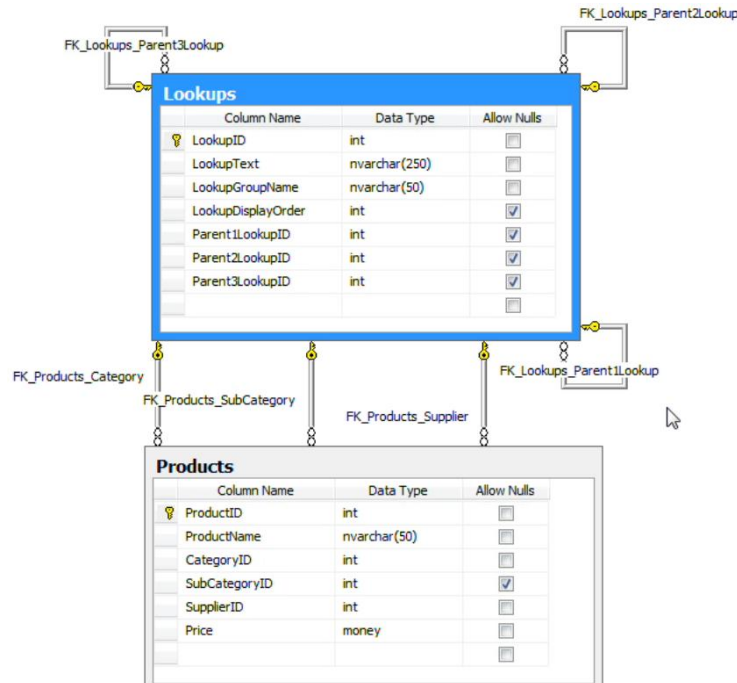


COOKBOOK

Universal Lookup

Universal Lookup Database

Universal Lookup functionality allows extension of otherwise static database structures with custom fields, and simplifies maintenance of lookup records in a fixed set of tables. Below is a sample database diagram with a universal lookup. *Lookup* table in the middle has integer *LookupID*, string *LookupText*, and *LookupGroupName* field. Lookup records in the same group constitute a virtual lookup dataset.



Below is a list of records available in this table. There are several records with the group *Categories*, some other ones with the groups *Sub Categories*, *Suppliers*, and *Comm Methods*.

| | LookupID | LookupText | LookupGroupN... | LookupDisplay... | Parent1LookupID | Parent2LookupID | Parent3LookupID |
|---|----------|----------------|-----------------|------------------|-----------------|-----------------|-----------------|
| ▶ | 16 | Category 1 | Categories | 1 | NULL | NULL | NULL |
| | 17 | Category 2 | Categories | 2 | NULL | NULL | NULL |
| | 18 | Category 3 | Categories | 3 | NULL | NULL | NULL |
| | 19 | Sub Category 1 | Sub Categories | 1 | 16 | NULL | NULL |
| | 20 | Sub Category 2 | Sub Categories | 2 | 16 | NULL | NULL |
| | 21 | Sub Category 3 | Sub Categories | 3 | 17 | NULL | NULL |
| | 22 | Sub Category 4 | Sub Categories | 4 | 18 | NULL | NULL |
| | 23 | Sub Category 5 | Sub Categories | 5 | 18 | NULL | NULL |
| | 24 | Sub Category 6 | Sub Categories | 6 | 18 | NULL | NULL |
| | 25 | Sub Category 7 | Sub Categories | 7 | 18 | NULL | NULL |
| | 26 | Sub Category 8 | Sub Categories | 8 | 18 | NULL | NULL |
| | 27 | Supplier 1 | Suppliers | NULL | NULL | NULL | NULL |
| | 28 | Supplier 2 | Suppliers | NULL | NULL | NULL | NULL |
| | 29 | Supplier 3 | Suppliers | NULL | NULL | NULL | NULL |
| | 30 | Comm Method 1 | Comm Methods | NULL | NULL | NULL | NULL |
| | 31 | Comm Method 2 | Comm Methods | NULL | NULL | NULL | NULL |
| | 32 | Comm Method 3 | Comm Methods | NULL | NULL | NULL | NULL |

The lookup table also has three self-referring keys, *Parent1LookupID*, *Parent2LookupID*, and *Parent3LookupID*. This can be used to refer to the category of a subcategory. You can see which subcategories belong to which category in the field list. The references in our example are under *Parent2LookupID* field.

The products table has *CategoryID*, *SubCategoryID*, and *SupplierID*, all of whom are referring to the same lookups table. You will have to set up foreign keys to allow *Code On Time Generator* to detect the relationship that the universal lookup table creates.

This script creates the database tables for *Microsoft SQL Server*.

```
USE [UniversalLookups]
GO
/***** Object: Table [dbo].[Lookups] *****/
SET ANSI_NULLS ON
GO
SET QUOTED_IDENTIFIER ON
GO
CREATE TABLE [dbo].[Lookups] (
    [LookupID] [int] IDENTITY(1,1) NOT NULL,
    [LookupText] [nvarchar](250) NOT NULL,
    [LookupGroupName] [nvarchar](50) NOT NULL,
    [LookupDisplayOrder] [int] NULL,
    [Parent1LookupID] [int] NULL,
    [Parent2LookupID] [int] NULL,
    [Parent3LookupID] [int] NULL,
    CONSTRAINT [PK_Lookups] PRIMARY KEY CLUSTERED
(
    [LookupID] ASC
)WITH (PAD_INDEX = OFF, STATISTICS_NORECOMPUTE = OFF, IGNORE_DUP_KEY = OFF,
ALLOW_ROW_LOCKS = ON, ALLOW_PAGE_LOCKS = ON) ON [PRIMARY]
) ON [PRIMARY]
GO
/***** Object: Table [dbo].[Products] *****/
SET ANSI_NULLS ON
GO
SET QUOTED_IDENTIFIER ON
GO
CREATE TABLE [dbo].[Products] (
    [ProductID] [int] NOT NULL,
    [ProductName] [nvarchar](50) NOT NULL,
    [CategoryID] [int] NOT NULL,
    [SubCategoryID] [int] NULL,
    [SupplierID] [int] NOT NULL,
    [Price] [money] NOT NULL,
    CONSTRAINT [PK_Products] PRIMARY KEY CLUSTERED
(
    [ProductID] ASC
)WITH (PAD_INDEX = OFF, STATISTICS_NORECOMPUTE = OFF, IGNORE_DUP_KEY = OFF,
ALLOW_ROW_LOCKS = ON, ALLOW_PAGE_LOCKS = ON) ON [PRIMARY]
) ON [PRIMARY]
GO
/***** Object: ForeignKey [FK_Lookups_Parent1Lookup] *****/
```

```

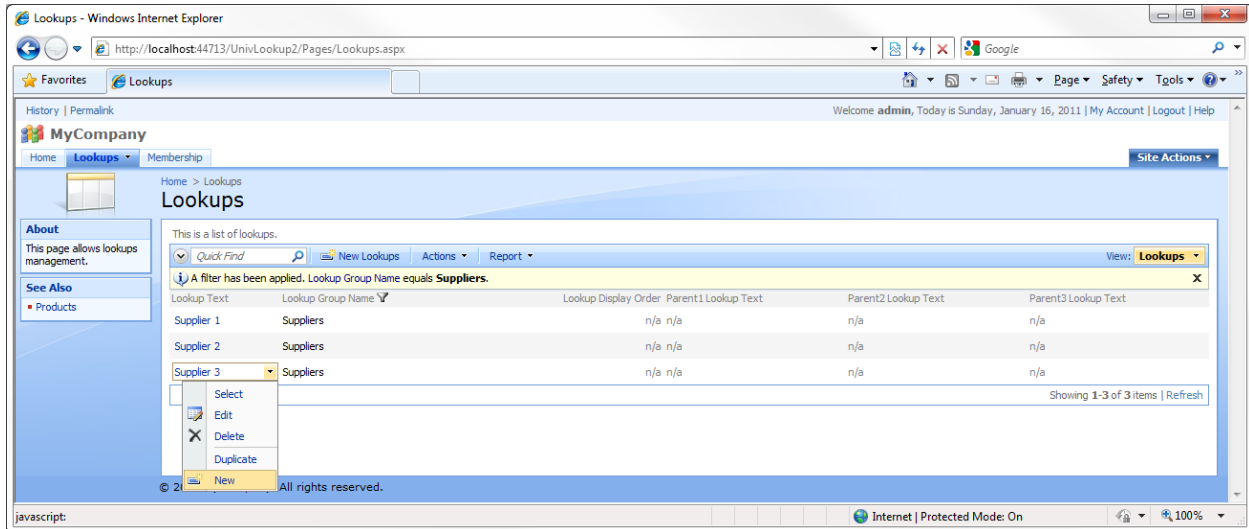
ALTER TABLE [dbo].[Lookups] WITH CHECK ADD CONSTRAINT
[FK_Lookups_Parent1Lookup] FOREIGN KEY([Parent1LookupID])
REFERENCES [dbo].[Lookups] ([LookupID])
GO
ALTER TABLE [dbo].[Lookups] CHECK CONSTRAINT [FK_Lookups_Parent1Lookup]
GO
/***** Object: ForeignKey [FK_Lookups_Parent2Lookup] *****/
ALTER TABLE [dbo].[Lookups] WITH CHECK ADD CONSTRAINT
[FK_Lookups_Parent2Lookup] FOREIGN KEY([Parent2LookupID])
REFERENCES [dbo].[Lookups] ([LookupID])
GO
ALTER TABLE [dbo].[Lookups] CHECK CONSTRAINT [FK_Lookups_Parent2Lookup]
GO
/***** Object: ForeignKey [FK_Lookups_Parent3Lookup] *****/
ALTER TABLE [dbo].[Lookups] WITH CHECK ADD CONSTRAINT
[FK_Lookups_Parent3Lookup] FOREIGN KEY([Parent3LookupID])
REFERENCES [dbo].[Lookups] ([LookupID])
GO
ALTER TABLE [dbo].[Lookups] CHECK CONSTRAINT [FK_Lookups_Parent3Lookup]
GO
/***** Object: ForeignKey [FK_Products_Category] *****/
ALTER TABLE [dbo].[Products] WITH CHECK ADD CONSTRAINT
[FK_Products_Category] FOREIGN KEY([CategoryID])
REFERENCES [dbo].[Lookups] ([LookupID])
GO
ALTER TABLE [dbo].[Products] CHECK CONSTRAINT [FK_Products_Category]
GO
/***** Object: ForeignKey [FK_Products_SubCategory] *****/
ALTER TABLE [dbo].[Products] WITH CHECK ADD CONSTRAINT
[FK_Products_SubCategory] FOREIGN KEY([SubCategoryID])
REFERENCES [dbo].[Lookups] ([LookupID])
GO
ALTER TABLE [dbo].[Products] CHECK CONSTRAINT [FK_Products_SubCategory]
GO
/***** Object: ForeignKey [FK_Products_Supplier] *****/
ALTER TABLE [dbo].[Products] WITH CHECK ADD CONSTRAINT
[FK_Products_Supplier] FOREIGN KEY([SupplierID])
REFERENCES [dbo].[Lookups] ([LookupID])
GO
ALTER TABLE [dbo].[Products] CHECK CONSTRAINT [FK_Products_Supplier]
GO

```

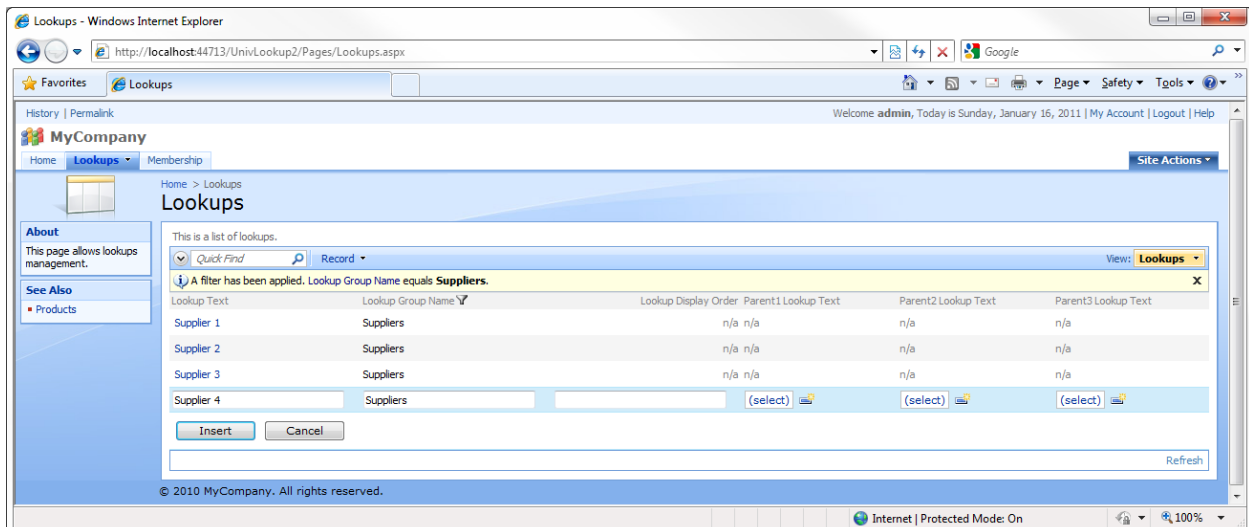
Using the Standard Application

Here is the standard *Web Site Factory* project that is generated straight from the *UniversalLookup* database. Navigate to the *Lookups* page, and you will see a list of records similar to what *SQL Management Studio* provides (with some more advanced functionality, such as adaptive filtering), and you can easily add new records to the table.

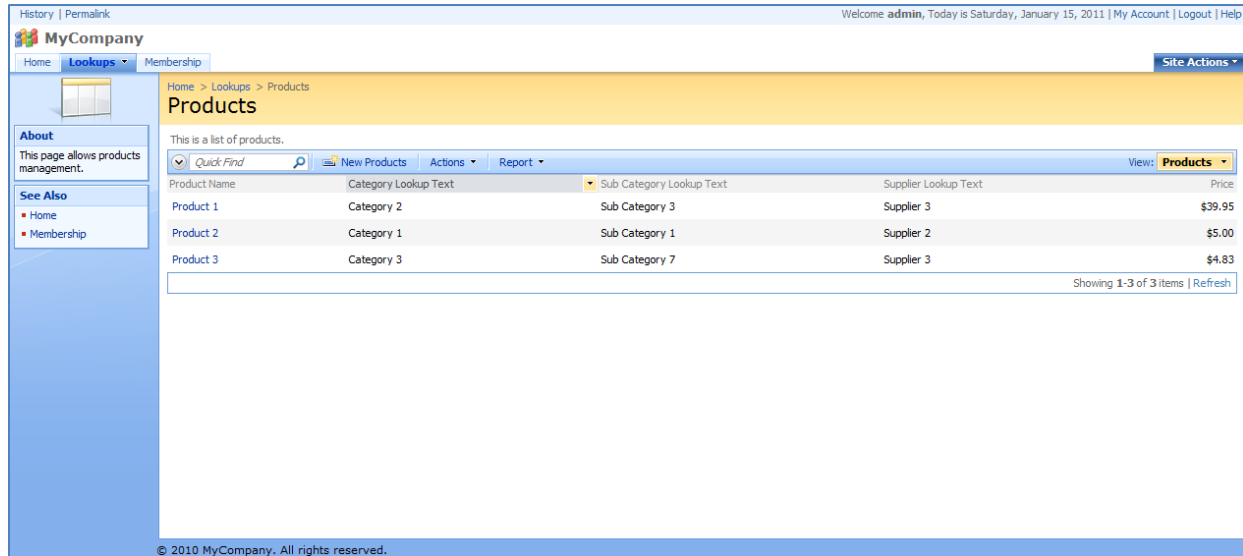
Set *Lookup Group Name* filter to *Suppliers* (using the column header), click on the dropdown menu next to *Supplier 3*, and press *New*.



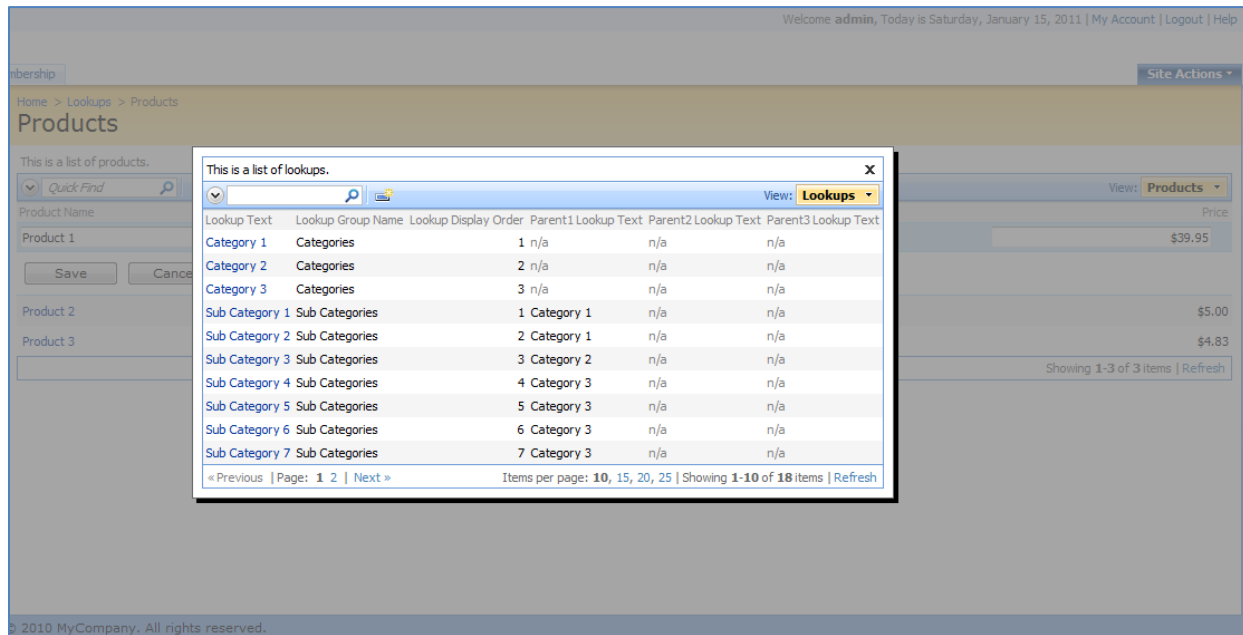
A new inline row will appear. *Lookup Text* field will be called "Supplier 4", with *Lookup Group Name* of "Suppliers". Press *Insert*, and the record will be saved.



Now, switch to the *Products* page. The product records are displayed, but with a few deficiencies. The “Text” suffix is included for three of the fields (*Category Lookup*, *Sub Category Lookup*, *Supplier Lookup*).



When a record is edited, the lookup values for those fields are not limited by *Lookup Group Name*. All values are presented.



Modifying the Standard Application

Bring up *Code On Time Generator*, select the project name, and press *Design*. Select the *Lookups* controller and switch to the *Views* tab. Edit View *grid1*, and change *Sort Expression* to

LookupGroupName, LookupDisplayOrder

Project Designer [exit]

Home > Controller: Lookups > View: **grid1**

View | Categories | Styles | Data Fields

Please review view information below. Click Edit to change this record, click Delete to delete the record, or click Cancel/Close to return back.

Record ▾ View: **View**

* - indicates a required field

General
Id and type of the view.

Id *
grid1

Controller
Lookups

Type *
 Grid
 Form

Command, Label & Header Text
Specify the command, label and header text for this view.

Command *
command1

Label *
Lookups

Header Text
\$DefaultGridViewDescription

Sort and Filter
Sort expression is a list of data field names of this view, each followed by optional *asc* or *desc* suffix.

Sort Expression
LookupGroupName, LookupDisplayOrder

[OK] [Delete] [Cancel]

Now, go back to *All Controllers*, and select *Products* controller. Switch to *Fields* tab. Edit the fields with "Lookup Text" in the *Label*, and remove the relevant text from their respective *Label*.

Controller | Commands | **Fields** | Views | Categories | Data Fields | Action Groups | Actions

This is a list of fields.

Quick Find [magnifying glass] Record ▾ View: **Fields**

| Name | Index | Type | Allow Nulls | Is Primary Key | Read Only | QBE | Sort | LEV | Label |
|-----------------------|-------|---------|-------------------------------------|--------------------------|-------------------------------------|-------------------------------------|-------------------------------------|--------------------------|----------------------|
| ProductID | 1 | Int32 | No | Yes | No | Yes | Yes | No | Product# |
| ProductName | 2 | String | No | No | No | Yes | Yes | No | Product Name |
| CategoryID | 3 | Int32 | No | No | No | Yes | Yes | No | Category# |
| CategoryLookupText | 4 | String | Yes | No | Yes | Yes | Yes | No | Category |
| SubCategoryID | 5 | Int32 | Yes | No | No | Yes | Yes | No | Sub Category# |
| SubCategoryLookupText | 6 | String | Yes | No | Yes | Yes | Yes | No | Sub Category |
| SupplierID | 7 | Int32 | No | No | No | Yes | Yes | No | Supplier# |
| SupplierLookupText | 8 | String | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | Supplier Lookup Text |
| Price | 9 | Decimal | No | No | No | Yes | Yes | No | Price |

[Save] [Cancel]

We will also need to make some modifications to a few fields (*CategoryID*, *SubCategoryID*, and *SupplierID*) to make sure the lookup values are filtered properly. Edit the *CategoryID* field, and scroll down to the *Dynamic Properties* section. Change *Context Fields* value to

LookupGroupName='Categories'

| | |
|---|---|
| Dynamic Properties Context fields may be listed to limit the lookup records by values of other fields of this controller. You can list multiple fields separated by comma. Field configuration can be used to provide dynamic values for the field properties. The values are derived from other fields in the same data row. List one property per line in format <i>Property=FieldName</i> . | Context Fields LookupGroupName='Categories' Dynamic Configuration |
|---|---|

Save the record, and select *SubCategoryID*. Scroll down to the *Dynamic Properties* section, and in *Context Fields*, insert

LookupGroupName='Sub Categories', Parent1LookupID=CategoryID

| | |
|---|---|
| Dynamic Properties Context fields may be listed to limit the lookup records by values of other fields of this controller. You can list multiple fields separated by comma. Field configuration can be used to provide dynamic values for the field properties. The values are derived from other fields in the same data row. List one property per line in format <i>Property=FieldName</i> . | Context Fields LookupGroupName='Sub Categories', Parent1LookupID=CategoryID Dynamic Configuration |
|---|---|

Save the change, and edit *SupplierID*. Scroll down to *Dynamic Properties*, and type in

LookupGroupName='Suppliers'

| | |
|---|--|
| Dynamic Properties Context fields may be listed to limit the lookup records by values of other fields of this controller. You can list multiple fields separated by comma. Field configuration can be used to provide dynamic values for the field properties. The values are derived from other fields in the same data row. List one property per line in format <i>Property=FieldName</i> . | Context Fields LookupGroupName='Suppliers' Dynamic Configuration |
|---|--|

Save the record, close the Designer, and generate the application.

View the Modifications

The columns are now displaying proper headers, with no extraneous “Lookup Text”. The records are now sorted according to *Lookup Group Name* and *Lookup Display Order*.

| Lookup Text | Lookup Group Name | Lookup Display Order | Parent1 | Parent2 | Parent3 |
|----------------|-------------------|----------------------|------------|---------|---------|
| Category 1 | Categories | 1 | n/a | n/a | n/a |
| Category 2 | Categories | 2 | n/a | n/a | n/a |
| Category 3 | Categories | 3 | n/a | n/a | n/a |
| Comm Method 1 | Comm Methods | n/a | n/a | n/a | n/a |
| Comm Method 2 | Comm Methods | n/a | n/a | n/a | n/a |
| Comm Method 3 | Comm Methods | n/a | n/a | n/a | n/a |
| Sub Category 1 | Sub Categories | 1 | Category 1 | n/a | n/a |
| Sub Category 2 | Sub Categories | 2 | Category 1 | n/a | n/a |
| Sub Category 3 | Sub Categories | 3 | Category 2 | n/a | n/a |
| Sub Category 4 | Sub Categories | 4 | Category 3 | n/a | n/a |

If you navigate to the *Products* page, you can see the extraneous text has been removed here as well.

| Product Name | Category | Sub Category | Supplier | Price |
|--------------|------------|----------------|------------|---------|
| Product 1 | Category 2 | Sub Category 3 | Supplier 3 | \$39.95 |
| Product 2 | Category 1 | Sub Category 1 | Supplier 2 | \$5.00 |
| Product 3 | Category 3 | Sub Category 7 | Supplier 3 | \$4.83 |

If you edit a record, and select a *Category* with the lookup, you will only see *Categories*. If you open the *Sub Category* lookup, only sub categories relevant to the selected *Category* will be shown. *Supplier* lookup will only show suppliers.

| Lookup Text | Lookup Display Order | Parent2 | Parent3 |
|----------------|----------------------|---------|---------|
| Sub Category 4 | 4 | n/a | n/a |
| Sub Category 5 | 5 | n/a | n/a |
| Sub Category 6 | 6 | n/a | n/a |
| Sub Category 7 | 7 | n/a | n/a |
| Sub Category 8 | 8 | n/a | n/a |

Further Modification

Nevertheless, lookups for those fields are not really that convenient for the end user. Let's modify the presentation to display a dropdown list for *Category*, radio button list for *Sub Category*, and a list box for *Supplier*.

Open the *Designer*, select the *Products* controller, switch to *Fields* tab, and edit *CategoryID*. Scroll down to *Lookup* section, and select "Drop Down List" for *Items Style*. *Data Value Field* is "LookupID" and *Data Text Field* is "LookupText".

The screenshot shows the 'Lookup' configuration panel for the *CategoryID* field. On the left, there is a 'Lookup' section with explanatory text. On the right, the configuration options are: 'Items Style' set to 'Auto Complete', 'Items Data Controller' set to 'Lookups', 'Data Value Field' set to 'LookupID', and 'Data Text Field' set to 'LookupText'. There is also a 'Copy' field with a scroll bar.

Save, and edit *SubCategoryID* field. Change *Items Style* to "Radio Button List".

The screenshot shows the 'Lookup' configuration panel for the *SubCategoryID* field. On the right, the configuration options are: 'Items Style' set to 'Radio Button List', 'Items Data Controller' set to 'Lookups', 'Data Value Field' set to '(select)', and 'Data Text Field' set to '(select)'. There is also a 'Copy' field with a scroll bar.

Save, and edit *SupplierID* field. Change *Items Style* to "List Box".

The screenshot shows the 'Lookup' configuration panel for the *SupplierID* field. On the right, the configuration options are: 'Items Style' set to 'List Box', 'Items Data Controller' set to 'Lookups', 'Data Value Field' set to '(select)', and 'Data Text Field' set to '(select)'. There is also a 'Copy' field with a scroll bar.

Save the field, close the *Designer*, and generate the application. When the web page opens, navigate to *Products* page. If you edit a record, you can see the new item lookup styles in action.

