



Many-to-Many Fields

This screen features a *many-to-many* field, named *Territories*. You can see that multiple territories are comma-separated in a *Territories* column, and these territories represent every single territory assigned to the employee.

Last Name	First Name	Title	Title Of Courtesy	Birth Date	Hire Date	Address	City	Region	Postal Code	Territories
Davolio	Nancy	Sales Representative	Ms.	12/8/1948	5/1/1992	507 - 20th Ave. E.Apt. 2A	Seattle	WA	98122	Georgetow , Neward , Wilton
Fuller	Andrew	Vice President, Sales	Dr.	2/19/1952	8/14/1992	908 W. Capital Way	Tacoma	WA	98401	Bedford , Boston , Cambridge , Georgetow , Louisville , Westboro
Leverling	Janet	Sales Representative	Ms.	8/30/1963	4/1/1992	722 Moss Bay Blvd.	Kirkland	WA	98033	Atlanta , Orlando , Savannah , Tampa
Peacock	Margaret	Sales Representative	Mrs.	9/19/1937	5/3/1993	4110 Old Redmond Rd.	Redmond	WA	98052	Cambridge , Greensboro , Rockville
Buchanan	Steven	Sales Manager	Mr.	3/4/1955	10/17/1993	14 Garrett Hill	London	n/a	SW1 8JR	Edison , Fairport , Melville , Morristown , New York , New York , Providence
Suyama	Michael	Sales Representative	Mr.	7/2/1963	10/17/1993	Coventry House/Miner Rd.	London	n/a	EC2 7JR	Bellevue , Phoenix , Redmond , Scottsdale , Seattle
King	Robert	Sales Representative	Mr.	5/29/1960	1/2/1994	Edgeham Hollow/Winchester Way	London	n/a	RG1 9SP	Campbell , Chicago , Colorado Springs , Denver , Menlo Park , San Francisco , Santa Clara , Santa Cruz
Callahan	Laura	Inside Sales Coordinator	Ms.	1/9/1958	3/5/1994	4726 - 11th Ave. N.E.	Seattle	WA	98105	Beachwood , Findlay , Philadelphia , Racine
Dodsworth	Anne	Sales Representative	Ms.	1/27/1966	11/15/1994	7 Houndstooth Rd.	London	n/a	WG2 7LT	Bloomfield Hills , Hollis , Minneapolis , Portsmouth , Roseville , Southfield , Troy

If you go to detail view of a particular employee by clicking on the name of the employee in the list, you can see the associated territories. If you press the *Edit* button, you can see a checkbox list of all territories available.

Summary

Last Name: Davolio
First Name: Nancy
Title: Sales Representative
Title Of Courtesy: Ms.
Birth Date: 12/8/1948

About

This page allows employees management.

See Also

- Employee Territories

Birth Date: 12/8/1948 | Hire Date: 5/1/1992 | Address: 507 - 20th Ave. E.Apt. 2A | City: Seattle

Region: WA | Postal Code: 98122 | Country: USA

Home Phone: (206) 555-9857 | Extension: 5467

Notes: Education includes a BA in psychology from Colorado State University in 1970. She also completed "The Art of the Cold Call." Nancy is a member of Toastmasters International.

Reports To Last Name: Fuller

Photo Path: http://accweb/ememployees/davolio.bmp

Territories

<input type="checkbox"/> Atlanta	<input type="checkbox"/> Cary	<input type="checkbox"/> Hoffman Estates	<input type="checkbox"/> Philadelphia	<input type="checkbox"/> Santa Monica
<input type="checkbox"/> Austin	<input type="checkbox"/> Chicago	<input type="checkbox"/> Hollis	<input type="checkbox"/> Phoenix	<input type="checkbox"/> Savannah
<input type="checkbox"/> Beachwood	<input type="checkbox"/> Colorado Springs	<input type="checkbox"/> Louisville	<input type="checkbox"/> Portsmouth	<input type="checkbox"/> Scottsdale
<input type="checkbox"/> Bedford	<input type="checkbox"/> Columbia	<input type="checkbox"/> Melville	<input type="checkbox"/> Providence	<input type="checkbox"/> Seattle
<input type="checkbox"/> Bellevue	<input type="checkbox"/> Dallas	<input type="checkbox"/> Menlo Park	<input type="checkbox"/> Racine	<input type="checkbox"/> Southfield
<input type="checkbox"/> Bentonville	<input type="checkbox"/> Denver	<input type="checkbox"/> Minneapolis	<input type="checkbox"/> Redmond	<input type="checkbox"/> Tampa
<input type="checkbox"/> Bloomfield Hills	<input type="checkbox"/> Edison	<input type="checkbox"/> Morristown	<input type="checkbox"/> Rockville	<input type="checkbox"/> Troy
<input type="checkbox"/> Boston	<input type="checkbox"/> Fairport	<input type="checkbox"/> New York	<input type="checkbox"/> Roseville	<input type="checkbox"/> Westboro
<input type="checkbox"/> Braintree*	<input type="checkbox"/> Findlay	<input type="checkbox"/> New York	<input type="checkbox"/> San Francisco	<input checked="" type="checkbox"/> Wilton
<input type="checkbox"/> Cambridge	<input checked="" type="checkbox"/> Georgetow	<input type="checkbox"/> Neward	<input type="checkbox"/> Santa Clara	
<input type="checkbox"/> Campbell	<input type="checkbox"/> Greensboro	<input type="checkbox"/> Orlando	<input type="checkbox"/> Santa Cruz	

* - indicates a required field

OK | Delete | Cancel

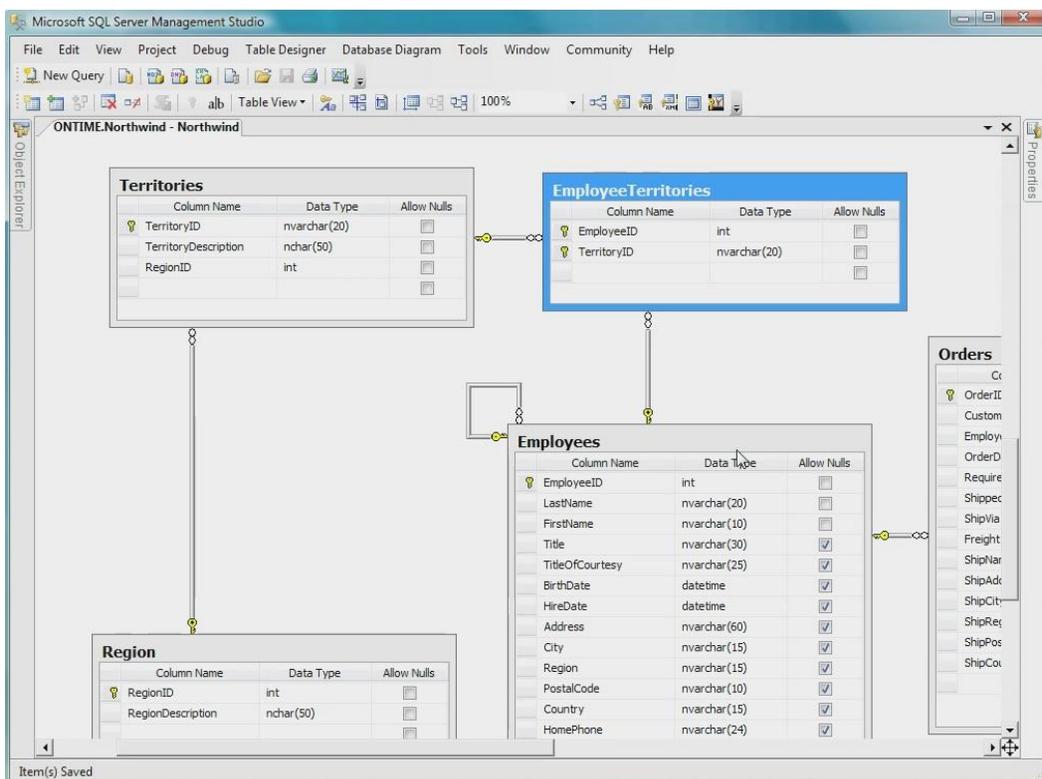
© 2010 MyCompany. All rights reserved.

If you check several territories by clicking on the checkbox next to their respective names, and press the *Ok* button to save, *Employee Territories* field will immediately reflect your changes. Click on the *Employee Territories* tab inside of the *Employees* page to view the changed territories as list.



If you were to delete the records by clicking on the dropdown next to the *Territory* name and pressing the *Delete* button, and go back to the *Employees* tab by pressing *Employees* tab inside the *Employees* page, and refresh by pressing the *Refresh* button in the bottom right corner, then you would see that the deleted *Territories* have been removed from the edited employee.

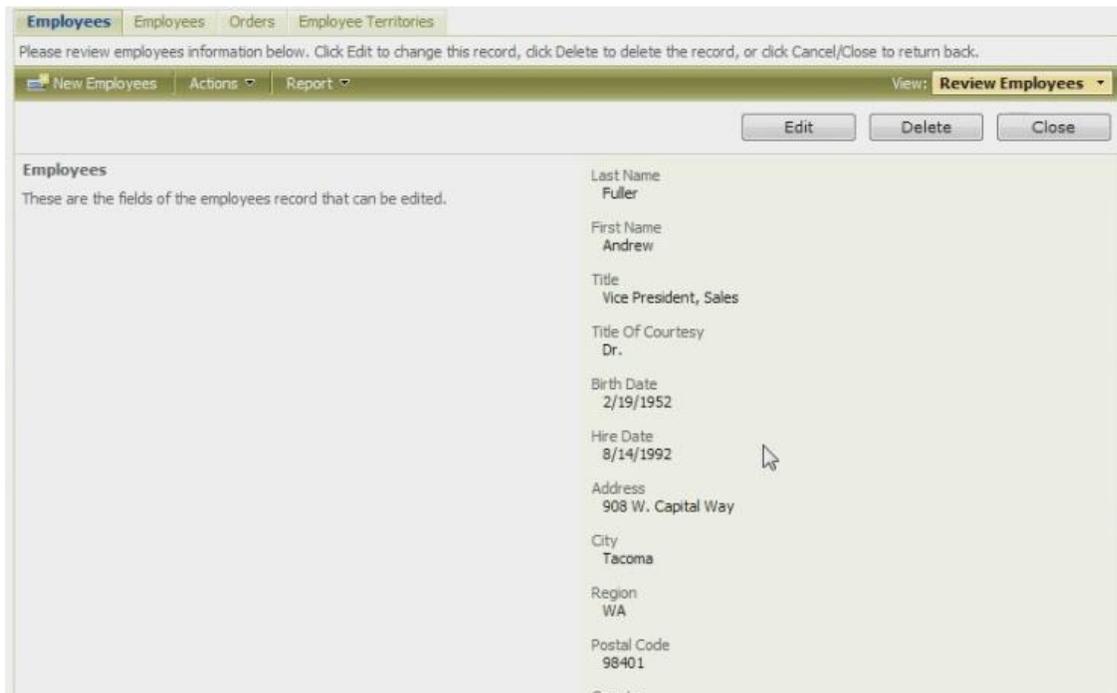
The database diagram is shown below. We were looking at *Employees* record. *EmployeeTerritories* links *Territories* to *Employees*. *Territories* were listed in the checkbox list. Any given territory may have many employees assigned to it, and any employee may be responsible for many territories, a *many-to-many* relationship.



We start with the *Employees* screen freshly generated by *Code OnTime Generator* with the *Web Site Factory* premium project. This screen may be accessed by pressing the *Employees* tab near the top of the screen. In the list, we can select a record by clicking on its respective row. Then, click on the *Employee Territories* tab inside of the *Employees* page to view the *Employee Territories* associated with your selected *Employee*. You can see the selected *Employee* in the box on the left side of the screen.

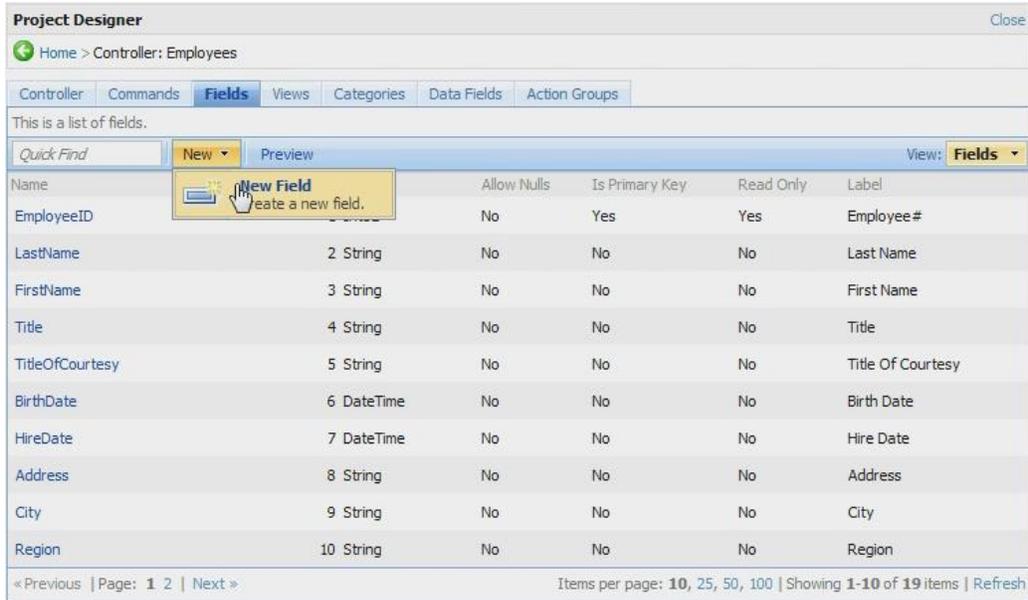


This approach works well, but sometimes it may be more convenient to have *Employee Territories* embedded into the *Employees* form. If we click on an *Employee* name in the list, we get taken to detail view of the *Employee*. We will see a long list of fields.

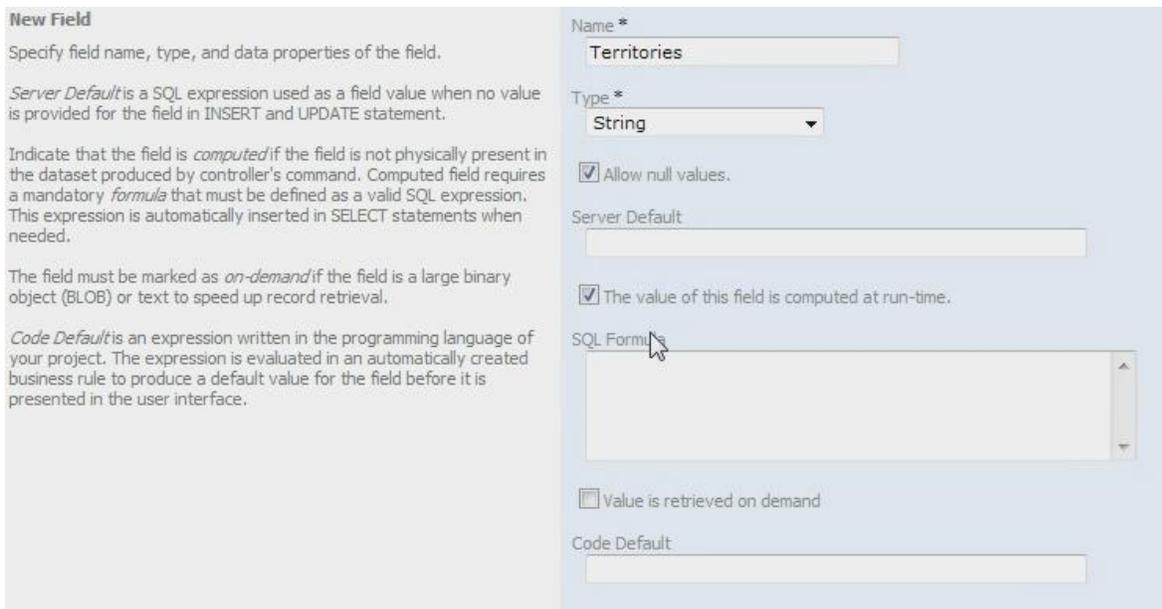


What we want to do is place an additional field that will represent *Employee Territories* as a list of checkboxes, and will allow us to select territories that the employee is responsible for. Also, we will make this form more compact so that it will look better when editing, and requires less scrolling.

Click on the *Code OnTime* link on your desktop to run the code generator. Click on the project name you wish to edit. Press the *Design* button near the bottom of the page to bring up the *Designer*. In the *Controller* tab, select *Employees* controller by clicking on its name. At the top of the screen, click on the *Fields* tab.



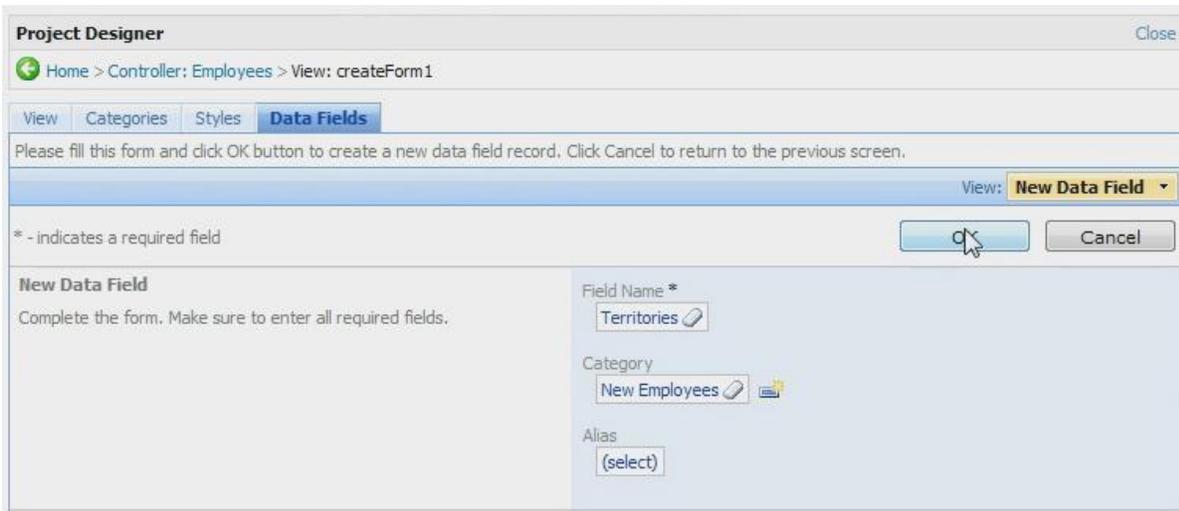
We need to create a new field to place *Employee Territories* in the *Employees* detail view. This field will not be a real field in the database, but a virtual representation of the list of territories assigned to the employee. On the action bar, Press *New | New Field*. In the *Name* box, type in *Territories*. Check the box next to “*Allow Null Values*” and “*The Value of this Field is computed at run-time.*” Leave the *SQL Formula* textbox that appears underneath blank, to insure that null value is automatically inserted into *Select* statement whenever an employee record is retrieved from the database.



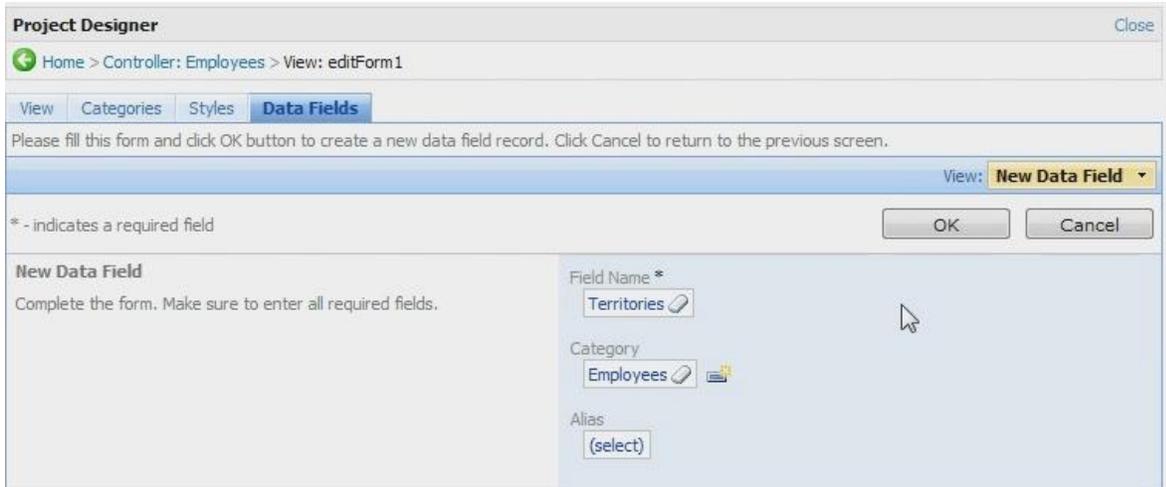
Type the text “Territories” in the “Label” box. In the *Lookup* section, set *Items Style* dropdown to *Check Box List*. For *Items Data Controller*, press the *(select)* link to bring up a list, and select *Territories* by clicking on its name in the list. You may need to page to reach it. For *Data Value Field*, press *(select)* and select *TerritoryID*. For *Data Text Field*, press *(select)* and click on *TerritoryDescription*. For *Target Controller*, which receives the list of territories, press *(select)* and choose *EmployeeTerritories*. Press the *OK* button at the bottom of the page to save the new field.



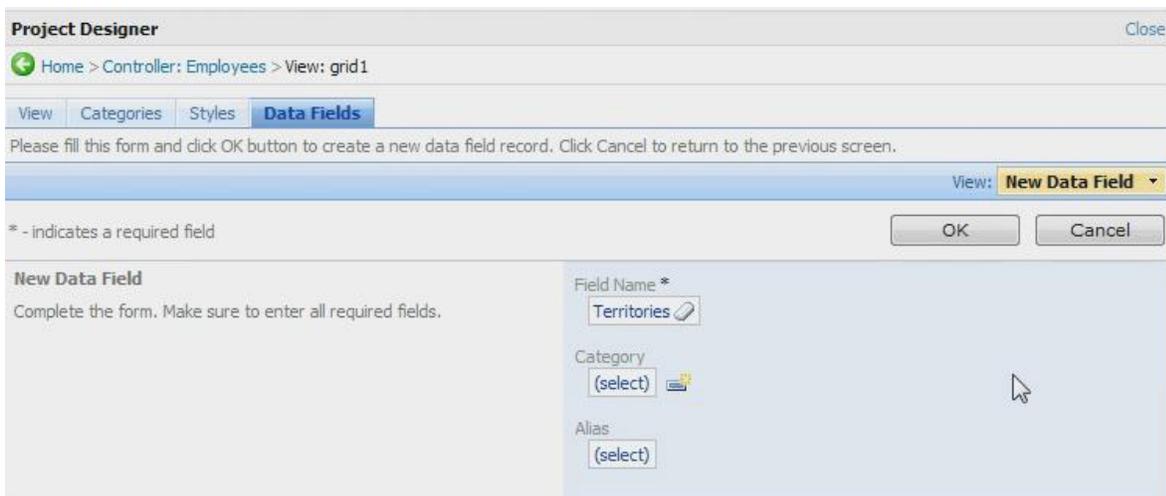
The next step is to insert this field into the views. Click on the *Views* tab at the top of the screen. Click on *createForm1*, and select the *Data Fields* tab at the top. On the action bar, press *New | New Data Field*. For *Field Name*, press *(select)* and select *Territories*, found on the second page of the lookup. For *Category*, press *(select)* and choose *New Employees*. Press the *OK* button to save the data field.



We’ll do the same for *editForm1*. Press the *Back* icon to navigate back to *Views*. Click on *editForm1* in the list. On the action bar, press *New | New Data Field*. For *Field Name*, press *(select)* and choose *Territories*. For *Category*, press *(select)* and click on *Employees*. Press the *OK* button to save this data field.

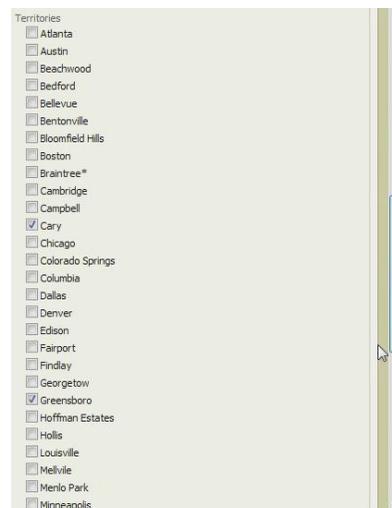


Go back to *Views* and click on *grid1*. Click on the *Data Fields* tab at the top. On the action bar, press *New | New Field*. For this one, we only need to set *Field Name*. Click on *(select)* and select *Territories*. Press the *OK* button to save this field.



Let's give it a try. On the action bar, press *Preview*. A web page should open that only displays *Employees*. Let's select the employee with the least number of territories, Margaret Peacock. Click on her last name in the list to view her detail view. Click on the *Edit* button. When we do this, a long list of territories is presented as checkboxes, and you can see that there are currently only three territories checked.

Now it's time to modify the user interface design of the form that we generated. Switch back to *Code OnTime Designer* and press the *Back* icon to go back to the list of *Views*. Click on the *Categories* tab, next to the *Views* tab.



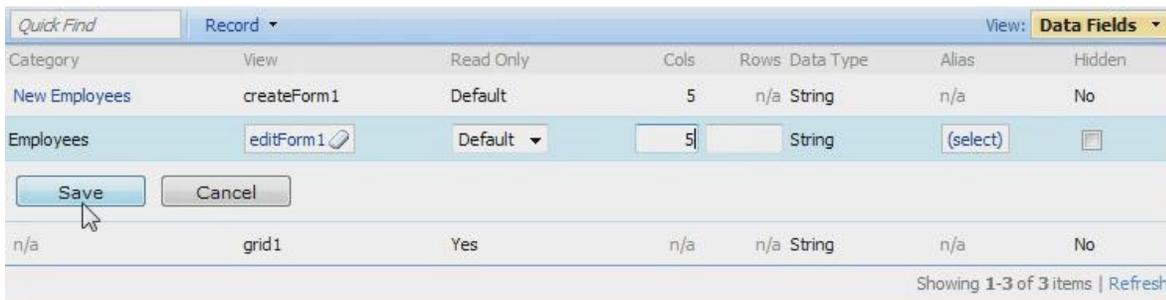
Click on the dropdown next to *New Employees* in the list, and press the *Edit* button. Change the *New Column* field to *Yes*. Change *Floating* field to *Yes* as well. Save changes by pressing the *Save* button. Do the same changes to *Employees* record.



Next, go back to *Views* by pressing on the *Views* tab. Click on *grid1* record. In the *Data Fields* tab, click on the dropdown and press the *Edit* button. Change *Read Only* to *Yes*. Press the *Save* button underneath the record to save. We need to do this to prevent *Territories* being displayed as a long list when users edit records in-place in the grid.



Return to the list of fields by pressing the *Back* icon in the upper left corner. Click on *Territories* field in the list. Click on *Data Fields* tab at the top. Click on the dropdown next to *New Employees* and press the *Edit* button. Change *Columns* cell to "5". Press the *Save* button underneath the record to save. Do the same thing for *Employees* data field.



Now press the *Close* link in the upper right side of the screen, press the *Next* button, and then press *Generate* to start generation of the web application. When finished, a web page will open with the generated application. Click on *Employees* tab at the top of the screen to go to *Employees*. You can see the *Territories* column displayed at the very right of the list. If you click on a dropdown and press the

Edit button, the territories remain read only and do not create a giant checkbox list. The inline editing of a row is much more comfortable.

Last Name	First Name	Title	Title Of Courtesy	Birth Date	Hire Date	Address	City	Region	Postal Code	Territories
Davolio	Nancy	Sales Represen	Ms.	12/8/1948	5/1/1992	507 - 20th Ave. E	Seattle	WA	98122	Atlanta , Cary , Georgetown , Hoffman Estates , Neward , Philadelphia , Santa Monica , Wilton
Fuller	Andrew	Vice President, Sales	Dr.	2/19/1952	8/14/1992	908 W. Capital Way	Tacoma	WA	98401	Bedford , Boston , Cambridge , Georgetown , Louisville , Westboro
Leverling	Janet	Sales Representative	Ms.	8/30/1963	4/1/1992	722 Moss Bay Blvd.	Kirkland	WA	98033	Atlanta , Orlando , Savannah , Tampa
Peacock	Margaret	Sales Representative	Mrs.	9/19/1937	5/3/1993	4110 Old Redmond Rd.	Redmond	WA	98052	Cary , Greensboro , Rockville
Buchanan	Steven	Sales Manager	Mr.	3/4/1955	10/17/1993	14 Garrett Hill	London	n/a	SW1 8JR	Edison , Fairport , Melville , Morristown , New York , New York , Providence
Suyama	Michael	Sales Representative	Mr.	7/2/1963	10/17/1993	Coventry HouseMiner Rd.	London	n/a	EC2 7JR	Bellevue , Phoenix , Redmond , Scottsdale , Seattle
King	Robert	Sales Representative	Mr.	5/29/1960	1/2/1994	Edgeham HollowWinchester Way	London	n/a	RG1 9SP	Campbell , Chicago , Colorado Springs , Denver , Menlo Park , San Francisco , Santa

If you click on an employee name in the list, you get taken to the detail view. You can see that the fields are arranged differently. If you press the *Edit* button underneath the action bar, the fields will reconfigure their position, and at the bottom you can see a five column checkbox list of all the territories.

Summary

Last Name: Davolio
 First Name: Nancy
 Title: Sales Representative
 Title Of Courtesy: Ms.
 Birth Date: 12/8/1948

About

This page allows employees management.

See Also

- Employee Territories

Birth Date: 12/8/1948 Hire Date: 5/1/1992 Address: 507 - 20th Ave. E.Apt. 2A City: Seattle

Region: WA Postal Code: 98122 Country: USA

Home Phone: (206) 555-9857 Extension: 5467 Photo:

Notes: Education includes a BA in psychology from Colorado State University in 1970. She also completed "The Art of the Cold Call." Nancy is a member of Toastmasters International.

Reports To Last Name: Fuller

Photo Path: http://accweb/ememployees/davolio.bmp

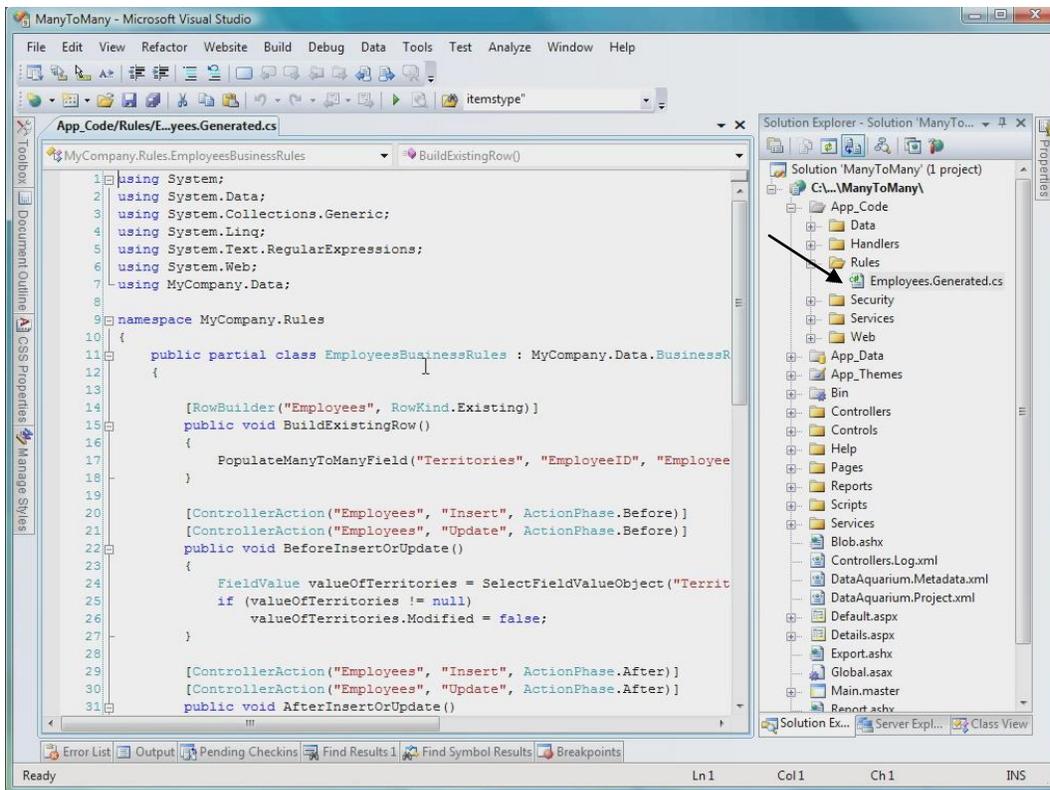
Territories:

<input checked="" type="checkbox"/> Atlanta	<input checked="" type="checkbox"/> Cary	<input checked="" type="checkbox"/> Hoffman Estates	<input checked="" type="checkbox"/> Philadelphia	<input checked="" type="checkbox"/> Santa Monica
<input type="checkbox"/> Austin	<input type="checkbox"/> Chicago	<input type="checkbox"/> Hollis	<input type="checkbox"/> Phoenix	<input type="checkbox"/> Savannah
<input type="checkbox"/> Beachwood	<input type="checkbox"/> Colorado Springs	<input type="checkbox"/> Louisville	<input type="checkbox"/> Portsmouth	<input type="checkbox"/> Scottsdale
<input type="checkbox"/> Bedford	<input type="checkbox"/> Columbia	<input type="checkbox"/> Melville	<input type="checkbox"/> Providence	<input type="checkbox"/> Seattle
<input type="checkbox"/> Bellevue	<input type="checkbox"/> Dallas	<input type="checkbox"/> Menlo Park	<input type="checkbox"/> Racine	<input type="checkbox"/> Southfield
<input type="checkbox"/> Bentonville	<input type="checkbox"/> Denver	<input type="checkbox"/> Minneapolis	<input type="checkbox"/> Redmond	<input type="checkbox"/> Tampa
<input type="checkbox"/> Bloomfield Hills	<input type="checkbox"/> Edison	<input type="checkbox"/> Morristown	<input type="checkbox"/> Rockville	<input type="checkbox"/> Troy
<input type="checkbox"/> Boston	<input type="checkbox"/> Fairport	<input type="checkbox"/> New York	<input type="checkbox"/> Roseville	<input type="checkbox"/> Westboro
<input type="checkbox"/> Braintree*	<input type="checkbox"/> Findlay	<input type="checkbox"/> New York	<input type="checkbox"/> San Francisco	<input checked="" type="checkbox"/> Wilton
<input type="checkbox"/> Cambridge	<input checked="" type="checkbox"/> Georgetown	<input checked="" type="checkbox"/> Neward	<input type="checkbox"/> Santa Clara	
<input type="checkbox"/> Campbell	<input type="checkbox"/> Greensboro	<input type="checkbox"/> Orlando	<input type="checkbox"/> Santa Cruz	

* - indicates a required field

OK Delete Cancel

This functionality comes from the business rules classes generated by *Code OnTime* to support the *Employees* data controller. The class is stored in the file *Employees.generated.cs*. The name of the class is *EmployeesBusinessRules*.



There are several methods adorned with *RowBuilder* and *ControllerAction* attributes. The first builds existing row, and populates *Many to Many* field *Territories*.

The second method is executed just before a record is about to be inserted or updated, and its purpose is to indicate that the field is not changed. The *Territories* field is a virtual field, and an attempt to update it will raise an exception.

The actual insertion is performed in *AfterInsertOrUpdate*, *UpdateManyToManyField* inherited from business rule class will do the trick.

BeforeDelete method is executed just before the *Delete* operation is attempted, and it eliminates *Territories* field associated with *Employees*.

Code OnTime LLC
<http://www.codeontime.com>