



GETTING STARTED WITH CODE ON TIME

Got data? Generate modern web apps in minutes. Learn to create sophisticated web apps with Code On Time application generator for ASP.NET, Azure, DotNetNuke, and SharePoint.

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Creating "Code" Business Rule to Handle the Action
--

Creating an App

Let's create a new Web Site Factory project.

Start Code On Time web application generator and select Web Site Factory under New Project.

🕑 Welcome - Code On Time		x	
	***	^	
Activation			
You are using Code OnTime (Some of the project features re	You are using Code OnTime Generator for Microsoft.NET. A collection of code generation projects is included. Some of the project features require an activation code. Register your activation code.		
My Projects			
Please start by selecting a proj information required to general code.	ect in the library below. The project wizard will guide you through a series of pages to gather te an application code of the selected project type. Some of the project features require a activation		
New Project			
S Azure Factory	Create an Azure Cloud solution from your SQL Azure database. Includes a Web Role and class library implementing a web site with navigation system, role-based security, membership manager, built-in data export, reporting, and much more. Have it online in 15 minutes.		
🕸 DotNetNuke Factory	Create application pages as controls with data views incorporated in a DotNetNuke module. Registered module can be configured by end users. Integrate a line-of-business database application with a popular open source web content management system in minutes.		
🗱 SharePoint Factory	Create a collection of application pages implemented as user controls; package them for deployment as Microsoft SharePoint 2010 Feature with a single Web Part. Integrate a line-of- business database application with a widely adopted corporate web content management system.		
👔 Web App Factory	Create an ASP.NET/AJAX solution composed of a web application project and class library implementing a web site with navigation system, role-based security, membership manager, built- in data export and reporting, adaptive filtering, advanced search options, and much more.		
🦫 Web Site Factory	Create an ASP.NET/AJAX web site with navigation system, role-based security, membership manager, built-in data export and reporting, adaptive filtering, advanced search options, and much more. The generated project is managed via the file system folder structure.		
 We recommend creating we required. 	e a "Web Site Factory" project Double for the using Code On Time. No additional software is		
Learn to develop web applic	ations with Code On Time.		
Use free Microsoft Visual We	D Developer Express to further customize generated projects when needed.	-	
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The next page will prompt to specify a name and programming language of the project.

Select the programming language of your choice and specify the following name:

Property	Value
Name	MyProject1

🕑 Create Project - Code On Time 📃 📃 💻 💴
Please enter the project name and click the <i>Create</i> button.
New Project
Vendor: Code OnTime LLC http://www.codeontime.com
Web Site Factory Create an ASP.NET/AJAX web site with navigation system, role-based security, membership manager, built-in data export and reporting, adaptive filtering, advanced search options, and much more. The generated project is managed via the file system folder structure. Review a complete feature list of this project. Try a live demo now. Name: MyProject1 Language: C# ▼
Create Cancel
© 2012 Code OnTime LLC. All rights reserved. Version 7.0.1.0.

Press Create button to create the project.

The next page allows changing the *Namespace* and the version of *Microsoft*.*NET Framework*. Leave the default values and press *Next*.

MyProject1 / Namespace and Framework - Code On Time	
	~
You are about to generate an ASP.NET/AJAX project Web Site Factory.	
About This Project	
Data Aquarium Framework is in the foundation of this web site project. The project includes a collection of code files, a single web service, and a few JavaScript components. The framework relies on XML data controller descriptors that combine SQL queries, data fields, views, and actions to render an advanced AJAX-powered presentation.	
A web site will incorporate the entire framework source code without any external dependencies. All images, JavaScript files, cascading stylesheets, and data controller descriptor files are included.	
Generated web site will include pages with data controller views. You can place custom user controls on the pages of your web application and perform any imaginable arrangement of application pages and navigation system.	
Review a complete feature matrix of our products.	
Try live demo projects and see AJAX magic in action.	
Namespace and Framework	
C# is the programming language of this project. The application framework code will be implemented in a custom namespace. Namespace:	
MyCompany	
The same identifier will be also used to name the web application theme and the connection string in the configuration file.	
Framework:	
.NET Framework 4.0 🔻	
Cancel Next	÷
8/28/2012 2:29:08 PM test passed 8/28/2012 2:29:08 PM copy input="[Documents]\Visual Studio 2010\Projects\Code On Time LLC\CodeOn Time\Code On Time Library \Data Aquarium\DataAquarium.Project xml" output="DataAquarium.Project xml"	•
8/28/2012 2:29:08 PM end if 8/28/2012 2:29:08 PM navigate url="\Data Aquarium\DataAquarium.Start.htm?splash=WebSiteFactory"	-

This page allows specifying the Data Provider and Connection String. Select your data provider from the list.

This tutorial uses *Microsoft SQL Server* database engine. If you do not have a database server, consider installing Microsoft SQL Server 2012 Express.

Click on the button to the right of the *Connection String* field to open the *Connection String Configuration* page.

Please specify a database connection string for this project.
A valid connection string compatible with the selected data provider is required to generate the project. Data controller descriptors are automatically built from your database and are easy to maintain with the provided XML schemas.
Data Provider:
.Net Framework Provider for SqlServer (System.Data.SqlClient)
Connection String:
All database tables and views are included in this project. Change Configure database connection string and install database features.

If you have SQL Server Express edition, specify the following:

Property	Value
Server	.\SQLEXPRESS
Database	Northwind
Sample Tables	Northwind

To the right of *Database* field, click on the *Create* button and confirm to create the database.

arvar.	
.\sqlexpress	
Windows authentication	
SQL Server authentication	
User name:	
Password:	
Database:	
Northwind	Create
Confirm Create database 'Nor	hwind' on the specified database server?
	Ves No

To the right of the *Sample Tables* dropdown, press *Install* and confirm to populate the project database with the *Northwind* dataset.

Server:	
.\SQLEXPRESS	
 Windows authentication 	
SQL Server authentication	Sample Database
User name:	
Password:	
Database:	Install 02 Northwind sample?
Northwind	
Sample Tables:	
You can populate the application database with	Yes INO

Code On Time does not offer tools to design databases. Use your favorite database management tools, such as *Microsoft SQL Server Management Studio*, to work with the database schema.

Our application will have built-in user and role management system. Code On Time applications rely on the security infrastructure available in ASP.NET.

Under *Membership* section, press *Add* and confirm to add *ASP.NET Membership* to the database.

f you own Un Status	Add Remove
Message f	rom webpage
?	Click OK to create tables and stored procedures required to support ASP.NET Membership and Role Manager in the database.
	OK Cancel

You will see a confirmation when the membership has been configured.

Press OK to finish configuration of the database connection string.

O MyProject1 / SQL Server Connection - Code On Time
Please specify SQL Server name and database.
Server connection
.\sqlexpress
Windows authentication
SQL Server authentication
User name:
Password:
Database:
Northwind Create
Sample Tables:
Northwind Install Uninstall Learn more about this sample.
Membership: Your application can be configured to implement <i>user and role manager</i> based on Microsoft ASP.NET Membership. If you own Unlimited edition then you may consider implementing custom membership and role providers instead.
Status Add Remove
Test OK Cancel
8/31/2012 11:58:34 AM ======

If you are using a trial version of the application generator, the project size is limited to 10 tables or views. To select a subset of tables for the project, click the *Change* button next to "All database tables and views are included in this project". Include the following tables: *Categories, Customers, Employees, EmployeeTerritories, Order Details, Orders, Products, Shippers, Suppliers,* and *Territories.*

Please specify a database connection string for this project.	
Database Connection	
A valid connection string compatible with the selected data p with the provided XML schemas.	provider is required to generate the project.
.Net Framework Provider for SqlServer (System.Data.SqlC	Client) 🗸
Connection String:	
Data Source=;Initial Catalog=Northwind;Integrated Secur	ity=True;
All database tables and views are included in this Database Object Filter	project. Change
Tables / Views	10 objects selected
 dbo.Alphabetical list of products dbo.Categories dbo.Category Sales for 1997 dbo.Current Product List dbo.Customer and Suppliers by City dbo.CustomerCustomerDemo 	OK Cancel

Press Next twice to reach the Reporting configuration page. Enable dynamic and static reports in the application.

Please specify your reporting preferences.
Reporting
Support for Microsoft Reporting Services technology can be embedded into your application. Dynamic reports are automatically created on-the-fly without a need for a standalone reporting server. Static reports are supported as well.
Application users will be able to render reports as Adobe PDF, Microsoft Office Excel, or Tiffimage file.
The Microsoft report viewer is required to run the reports. The <i>Microsoft Report Viewer Redistributable Package</i> includes Windows Forms and ASP.NET Web server controls for viewing reports designed using Microsoft reporting technology.
 Download the redistributable report viewer package for Microsoft.NET 3.5. Download the redistributable report viewer package for Microsoft.NET 4.0.
Attention: If you have Microsoft Visual Studio 2008/2010 installed on your computer then the viewer is likely installed already. Users of Visual Web Developer Express 2008/2010 will have to install the report viewer if reports are enabled for this project.
You have to install the viewer on the server machine when the generated application is deployed. Reports: Enable dynamic and static reports in my application.

Hold down *Shift* key and press *Next* – this will skip directly to the *Summary* page. Press the *Generate* button to start creation of the web application.



When generation is complete, the web site will open in your default browser.

A ttp://localhost:43526/Pages/Home.asp	☆ ★ A × 5 ◎ + Q →	
🤗 Start 🛛 🗙		
	Login to this website	
	User Name:	
💕 MyCompany	Password:	
Home	Remember me next time	
Home > Home	Forgot your password?	
Start	Sign up now	
Please select a page link in the table of contents below.	Sign in to access	
Site Map	Instructions	
Home	Two standard user accounts are automatically created when application is initialized if membership option has been selected for this application.	
	The administrative account admin is authorized to access all areas of the web site and membership manager. The standard user account is allowed to access all areas of the web site with the exception of membership manager.	
Move the mouse pointer over the link <i>Login to this v</i> on the right-hand side at the top of the page and sig with one of the accounts listed below.		
	Administrative account: admin / admin123%	
	Standard user account: user / user123%	
© 2012 MyCompany. All rights reserved.		

Using the Project Designer

The Project Designer allows customizing the pages and data controllers of the web application.

To activate the *Project Designer*, click on a project name on the start page of the application generator.

My Pr	ojects		
This is the list of the projects that you have created. Click on the project name to open and generate the project one more time. Note that most projects will automatically backup the previous version of the source code prior to generating and overwriting the existing files.			
#	Project Name	Туре	Last Modified
1.	by MyProject1	Web Site Factory	8/30/2012 3:02 PM
 Creat Lear Req Buy Orde Substant 	ate nev Select "MyProject of the develop web application uest help with your project a product edition now. er our consulting services of scribe to our newsletter.	t1" project. ons. t. online.	

Then, click on the *Design* button.



The Project Designer will open.

On the left side of the screen is the Project Browser. The right side contains the Project Explorer.

NW2 / Designer - C	ode On Time				
🕨 Generate 🛭 🕥 Bro	wse 🧀 Develop 👔	🍟 Open 🛛 🗳 Exit		^	🖗 AN 🕼 🗃 🖆 🖆 🖆 👘
(Home					b 🗟 Home
Pages Controllers	User Controls All	Commands All Fields	All Views	All Data Fields	a 🛅 Employees
This is a list of appl	ication pages.			0	container1
Quick Find	New -		Vá	ew: Pages T	Dia Orders
Name	Jaday Tila	Dath	Chilo	Deles	Employee Territories
Name	Index Hoe	Path	Style	Roles	a 🔝 Customers
Home	1000 Start	Home	Home	n/a	container1
Employees	1010 Employees	Employees	Generic	n/a	container2
Orders	1020 Orders	Employees Orders	Generic	n/a	Categories
Ciders	Eveloper	Employees Employees	Generic	nya	categories
EmployeeTerritories	1030 Territories	Territories	Generic	n/a	↓ in container2
Customers	1040 Customers	Customers	Generic	n/a	▷ Image: Products
OrderDetails	1050 Order Details	Customers Order Details	Generic	n/a	Suppliers
Categories	1060 Categories	Categories	Generic	n/a	Container1
Products	1070 Products	Categories Products	Generic	n/a	Territories
Shippers	1080 Shippers	Shippers	Generic	n/a	Membership
Suppliers	1090 Suppliers	Suppliers	Generic	n/a	
Territories	1100 Territories	Suppliers Territories	Generic	n/a	
Membership	1110 Membership Manager	Membership	Users	Administrators	
Project	Browsei	Sho	wing 1-12	of 12 items 🖉	
All customized project folder.	ct settings are stored in	*.Log.xml files located in t	the root of	your project	Project Explorer
© 2012 Code OnTime LLC	C. All rights reserved. Ve	ersion 7.0.1.0.			🛅 Pages 😤 Controllers 📴 User Controls

Project Browser

The *Project Browser* allows navigating the project configuration elements. The tabs display lists of pages, data controllers, user controls, commands, fields, views, and data fields.

Navigate to the properties page of an element by clicking on the link in the first column or using the context menu option *Open*.

🕨 Generate 🛛 🕥 Bro	wse 🛛 🐼 Develop	o 💕 Open 🛯 📲 Exit		
Home				
Pages Controllers	User Controls	All Commands All Field	s All Views	All Data Fields
🛅 This is a list of appl	ication pages.			0
Quick Find	O New -		Vi	ew: Pages -
Name	Index Title	Path	Style	Roles
Home	1000 Start	Home	Home	n/a
Empl Open	1010 Employees	Employees	Generic	n/a
Orde Sync	1020 Orders	Employees Order	s Generic	n/a
Empl Price Edit	1030 Employee Territories	Employees Emplo Territories	yee Generic	n/a
Customers	1040 Customers	Customers	Generic	n/a

The properties page of the project configuration element will open. The breadcrumbs in the path area above the *Project Browser* show the location of the object. The tabs at the top of the page will change to reflect project configuration elements that belong to the currently selected element.

🕨 Generate 🛛 🎯	Browse Develop 🚰 Open 🖳 Exit			
Home > Page: H	Home (Home)			
Page Containe	rs Data Views Controls			
📰 Click OK to save	e the page, or click Cancel to undo changes or return back.			
Record -	Sync View: Page -			
* - indicates a requir	* - indicates a required field OK Cancel			
General	Name *			
The Name is assigned to the generated physical page. Index specifies the order of the page in the application	Home Index 1000 Drag the page to the desired location to change the index. External Url			

Quickly access the Learning System article for the selected project configuration element by clicking on the question mark icon in the top right corner.

Page Containers Data	Views Controls				
📴 Click OK to save the page,	📴 Click OK to save the page, or click Cancel to undo changes or return back.				
Record 🔻 📳 Sync	Record - 🖓 Sync Learn about Pages				
* - indicates a required field		OK Cancel			
General The Name is assigned to the generated physical page.	Name * Home				

The *Project Explorer* can be synchronized with the current *Project Browser* element by using the Sync command on the action bar or pressing *Ctrl+Period* keyboard shortcut ("Ctrl" key and "." key).

Page Containers Data Views Controls	Home
Click OK to save the page, or dick Cancel to undo changes Record Sync	Container1
* - indicates a require Synchronize with Explorer (Ctrl+.)	Container2 Orders Orders Orders Orders
General Name * The Name is assigned to the Home	 ▲ Customers ▷ □ container1 ▷ □ container2

Project Explorer

The *Project Explorer* displays a logical hierarchy of project configuration elements separated into three tabs: *Pages*, *Controllers*, and *User Controls*.

⊿ 🛅 Home
▲ introduction and a container 1
Image: Second
S container2
🔺 🛅 Employees
b in container1
container2
Orders
Employee Territories
🛛 🛅 Customers
b in container1
b in container2
Drder Details
a 🛅 Categories
▷ b container1
▷ introduction container2
▷ III Products
▷ III Shippers
▲ 📰 Suppliers
▷ iii container1
container2
I erritories
Dembership
🛅 Pages 🐴 Controllers 🗄 User Controls

Double-click on a node in the *Project Explorer* or use the *Open* context menu option to display the properties page for the relevant element.

▲ I Home	Home > Container: Home / container2 (NewColumn)			
 Container1 Control1 - TableOfContents Container2 	Container Data Views Controls			
🖌 🛅 Open Enter				
Ist List Cut Ctrl+X	* - indicates a required field			
Copy Ctrl+C Copy Ctrl+C Copy Ctrl+C	General Id The Id can be container2			
Rename	Project Explorer. Page Home			
Show All Data Views Show All Controls	The way that the container will be positioned on the New Column			
 ▶ 10 <l< th=""><th>page is determined by Width <i>Flow</i> property.</th></l<>	page is determined by Width <i>Flow</i> property.			
▶ 📑 Membership	Example: CSS Class Name			

Drag project elements to change the application configuration. As an alternative, you can use Cut/Copy/Paste options in the context menu of project configuration element nodes. These operations can be performed on multiple selected elements of the same type.



Node names of project configuration elements can be changed using the *Rename* context menu option.



Navigate To

The Navigate To window will search for project configuration elements by property values as soon as you type a sample search criteria.

The window can be activated by clicking on the *Navigate To* icon on the *Project Explorer* toolbar or pressing the *Ctrl+Comma* keyboard shortcut ("Ctrl" key and "," key).



The *Navigate To* window will open. Start typing search terms. Matching entries will appear as soon as you stop typing.

Navigate To	
Search terms:	
products grid1 - P	<u>ا</u>
Result: Found 8 matching results.	
BD ProductSupplierCompanyName ["Field Name" of data field OrderDetails/Views/g 🔺	
G grid1 ["Id" of view Products/Views/grid1]	
Grid1 ["View" of data view Products/container1/view1]	
Grid1 ["View" of data view Products/container2/view2]	
Products ["Label" of view Products/Views/grid1]	
ab grid1 ["Command Argument" of action Products/Actions/ag1/a8]	1
ab grid1 ["When View" of action Products/Actions/ag4/a1]	
"Id" of view Products /Views/ grid1 grid1	
OK Cancel]

Highlight a result and press *OK* or press *Enter* on the keyboard to open the properties page of the element in the *Project Browser* and have it highlighted in the *Project Explorer*.



Creating a Three-Level Master-Detail Page

Let's create a page with a three-level master-detail relationship between *Customers*, *Orders*, and *Order Details* controllers.



Creating the Page

Start the Project Designer. On the toolbar of the Project Explorer, click on the New Page icon.

🤮 🗛 🖀 📴 🗳 🖆 🖆
▷ Home New Page ■ Employees
container1
container2
Orders
Employee Territories

Enter "OrderManager" in the page *Name* and press *OK* to create a new page.

Property	Value
Name	OrderManager

The Order Manager page will be added to the bottom of the list of pages in the *Project Explorer*. Drag Order Manager node to the right side of *Home* node to place it after the page.



Switch to the *Controllers* tab in the *Project Explorer*. While holding *Ctrl*, select the controllers in the following order: *Customers*, *Orders*, *OrderDetails*. Right-click on *OrderDetails*, and press *Copy*.

💱 🗛 🟠 😤	lî
** Categories ** Customers ** Employees ** Employees ** Employees ** OrderDetails ** Products ** Shippers ** Suppliers ** Territories	erritories Open Enter Copy Ctrl+C Clone Clone
🛅 Pages 🔩 Co	ontrollers 📴 User Controls

Switch back to the *Pages* tab. Right-click on *Order Manager* page node, and press *Paste* option. The controllers will be instantiated as data views in separate containers on the page.



Right-click on Order Manager page node, and press View in Browser.

 Home Order Manager 	
	Open Enter
⊳ 🗇 view2 (Cut Ctrl+X
≥ □ view3 (Copy Ctrl+C
▷ III Customers ▷ III Employees	Delete Del
Categories Shippers	Show All Containers
Suppliers	Exclude From Menu
Niembership	New Child Page
	New Container

Navigate to the *Order Manager* page. Three views will be available on the page, but they do not have any masterdetail relationships established between them. The three data views are completely independent from each other.

	manage	er								
This is a list	of customers.									
Quick	Find 🔎	Rew Custon	ners 🛛 🗔 Edit	🗙 Delete	Actions ~	Report	×	View	: Custo	mers 🗸
🗼 A filter l	nas been applied.	Company Name e	quals Antonio	Moreno Taque	ería.					x
Customer#	Company Name 🏹	Contact Name	Contact Tit	le Address	С	ity F	Region	Postal Code	Country	Phone
ANTON	Antonio Moreno Taquería	Antonio Moreno	Owner	Mataderos	2312 N	léxico).F. ⁿ	n/a	05023	Mexico	(5) 555- 3932
								Showing	1-1 of 1	items 🕏
This is a list	of orders.									
Quick	Find 🔎	New Orders	Actions 🗸	Report 🗠					View: O	rders 🗸
🔃 A filter l	has been applied.	Order Date equal	s 7/31/1996 .							x
Customer Company Na	Employee Li ame Name	ast Order	Required Sh	nipped Ship V	ia r	Freight Shi		d		Ship
		Date 1	Date De	ate Compa	any Name	reight on	ip Name	e Shi	ip Addres	City
White Clove Markets	^{er} Buchanan	7/31/1996	8/14/1996 8/	19/1996 Speed Expres	any Name ly ss	\$4.56 Wr	nite Clo nikets	ver 10 Av	ip Addres 29 - 12th e. S.	Seattle
White Clove Markets	^{er} Buchanan	7/31/1996	8/14/1996 8/	/9/1996 Speed Expres	any Name ly ss	\$4.56 Wh	nite Clo Irkets	ver 10 Av Showing	ip Addres 29 - 12th e. S. 1-1 of 1	seattle
White Clove Markets This is a list	er Buchanan	7/31/1996	8/14/1996 8/	ate Comp /9/1996 Speed Expre:	any Name ły ss	\$4.56 Wł Ma	nite Clor Irkets	ver 10. Av Showing	ip Addres 29 - 12th e. S. 1-1 of 1	Seattle
White Clove Markets This is a list	er Buchanan of order details.	7/31/1996	8/14/1996 8/	ate Compi 19/1996 Speed Exprei	any Name	\$4.56 Wh	nite Clo nite ts	ver 10. Av Showing View: 0	p Addres 29 - 12th e. S. 1-1 of 1 Order Do	s City Seattle items 2
White Clove Markets This is a list Quick I	er Buchanan of order details. Find P	7/31/1996	8/14/1996 8/ Details Action	ate Compi /9/1996 Speed Exprei	any Name	\$4.56 Wh	nite Clo rkets	ver 10. Av Showing View: 0	p Addres 29 - 12th e. S. 1-1 of 1 Order Do	s City Seattle items 2 etails v X
White Clove Markets This is a list Quick I A filter H Order Customer #	er Buchanan of order details. Find P nas been applied. I Product Name Y	7/31/1996	8/14/1996 8/ Details Action Jals Carnarvor	ate Compi (9/1996 Speed Expresion ns ✓ Report n Tigers. Quant Order Customer Company Name	any Name dy ss tity equals 6. Order Employee Last Name	\$4.56 Wh Ma	hite Clo rkets	ver 10. Av Showing View: 0 Product Category Name	29 - 12th e. S. 1-1 of 1 Order Do Proc y Com Nam	s City Seattle items 2 etails v tuct plier ipany ie
White Clove Markets This is a list Quick I A filter H Order Customer # SPECD	er Buchanan of order details. Find Nas been applied. I Product Name Carnarvon Tigers	7/31/1996	8/14/1996 8/ Details Action Jals Carnarvor ntity T Discour	ate Compi /9/1996 Speed Exprei ns ♥ Report n Tigers. Quant Order Customer Company Name 0 Spécialités du monde	any Name dy ss tity equals 6. Order Employee Last Name Leverling	Source of the second se	hite Clo rkets Ship npany	ver 10. Av Showing View: 0 Product Category Name Seafood	p Addres 29 - 12th e. S. 1-1 of 1 Order Do Proc Sup Com Nam Pavl	s City Seattle items 2 etails ~ Auct plier ipany iee

Establishing Master-Detail Relationships

Switch back to the *Project Designer*. In the *Project Explorer*, drag the data field node *Order Manager / c102 / view2 / grid1 / CustomerID* onto the view node *Order Manager / c101 / view1*. This will configure a master-detail relationship between *view2* and *view1*, with *CustomerID* as the filter field.



Next, drag the data field node Order Manager / c103 / view3 / grid1 / OrderID and drop it onto view node Order Manager / c102 / view2.



On the toolbar, press Browse.

Only the Customers data view is now visible on the Order Manager page.

This is a list	of customers.								
Quick	Find 🔎 🛋	New Custom	ers Actions V	Report 🗸			١	/iew: Cus	tomers
Customer#	Company Name	Contact Name	Contact Title	Address	City	Region	Postal Code	Country	Phone
ALFKI	Alfreds Futterkiste	Maria Anders	Sales Representative	Obere Str. 57	Berlin	n/a	12209	Germany	030- 0074321
ANATR	Ana Trujillo Emparedados y helados	Ana Trujillo	Owner	Avda. de la Constitución 2222	México D.F.	n/a	05021	Mexico	(5) 555- 4729
ANTON	Antonio Moreno Taquería	Antonio Moreno	Owner	Mataderos 2312	México D.F.	n/a	05023	Mexico	(5) 555- 3932
AROUT	Around the Horn	Thomas Hardy	Sales Representative	120 Hanover Sq.	London	n/a	WA1 1DP	UK	(171) 555 7788
BERGS	Berglunds snabbköp	Christina Berglund	Order Administrator	Berguvsvägen 8	Luleå	n/a	S-958 22	Sweden	0921-12 3 65
BLAUS	Blauer See Delikatessen	Hanna Moos	Sales Representative	Forsterstr. 57	Mannheim	n/a	68306	Germany	0621-084
BLONP	Blondesddsl père et fils	Frédérique Citeaux	Marketing Manager	24, place Kléber	Strasbourg	n/a	67000	France	88.60.15.
BOLID	Bólido Comidas preparadas	Martín Sommer	Owner	C/ Araquil, 67	Madrid	n/a	28023	Spain	(91) 555 2 82
BONAP	Bon app'	Laurence Lebihan	Owner	12, rue des Bouchers	Marseille	n/a	13008	France	91.24.45.
BOTTM	Bottom-Dollar	Elizabeth	Accounting	23 Tsawassen	Tsawassen	BC	T2F	Canada	(604) 555

Select a record from the list of customers, and orders related to the selection will appear in a data view underneath.

	customers.									
	م n	📑 New C	Customers	📝 Edit	🗙 Delete	Actions 🗸	Report ~	View:	Custon	iers 🗸
(i) A filter has	been applied.	Company N	ame equals	Ana Trujil	lo Empareda	dos y helad	los.			;
Customer# Co	mpany Name'	Conta Name	ict Cor	ntact Title	Address	City	Region	Postal Code Cour	ntry Pho	ne
An ANATR Em hel	a Trujillo paredados y ados	Ana Ti	rujillo Ow	ner	Avda. de la Constitución	Méxio 2222 D.F.	o n/a	05021 Mex	ico (5) 472	555- 9
								Showing 1	L-1 of 1 it	ems 🕻
This is a list of o	orders.	New C	Orders A	ctions 🗸	Report ~			۷	iew: Ord	lers 🔻
Employee Last Name	Order Date	Required Date	Shipped Date	Ship Via Company	Name Freig	ht Ship Name	2	Ship Addres	SS	Ship City
King	9/18/1996	10/16/1996	9/24/1996	Federal Shipping	\$1.6	51 Ana Trujil Empareda	o dos y helados	Avda. de la Constitución	n 2222	México D.F.
	8/8/1997	9/5/1997	8/14/1997	Speedy Express	\$43.9	90 Ana Trujil Empareda	o idos y helados	Avda. de la Constitución	n 2222	México D.F.
Leverling		12/26/1007	12/12/199	7 Federal Shipping	\$11.9	99 Ana Trujil Empareda	o idos y helados	Avda. de la Constitución	n 2222	México D.F.
Leverling Leverling	11/28/1997	12/20/1997								
Leverling Leverling Peacock	11/28/1997 3/4/1998	4/1/1998	3/11/1998	Federal Shipping	\$39.9	92 Ana Trujil Empareda	o dos y helados	Avda. de la Constitució	n 2222	México D.F.

Select an order, and order details for that order will be displayed.

This is a	a list of cus	tomers.										
 Qu 	uick Find	Q	🖃 New C	lustomers	💵 Edit	🗙 Delete	Actions	s ∨ Report ∨	Vie	w: Cus	tomers	~
🔃 A fil	lter has be	en applied.	Company Na	ame equals	Ana Trujill	lo Empared	ados y h	elados.				x
Custome	er# Comp	any Name 🍾	Conta Name	ct Cor	ntact Title	Address	C	City Regio	n Postal Code	Country	Phone	
ANATR	Ana T Empar helado	rujillo redados y os	Ana Tr	rujillo Ow	ner	Avda. de la Constitución	N 2222 D	léxico).F. n/a	05021 N	1exico	(5) 555- 4729	
									Showir	ng 1-1 of	1 items	12
Order	s											
This is a	a list of ord	ers.										
✓ Qu	uick Find	Q	🛋 New O)rders	🛛 Edit 🛛 🗙	Delete	Actions 🗸	Report 🗸		View:	Orders	~
i) A fil	lter has be	en applied.	Employee La	ast Name e	quals King.							x
imploye Name 🍾	ee Last o	order Date	Required Date	Shipped Date	Ship Via Company	Name Frei	ght Ship N	Name	Ship Add	dress	Ship City	
King	9	/18/1996	10/16/1996	9/24/1996	Federal Shipping	O \$1	.61 Ana T Empa	rujillo redados y helado	Avda. d s Constitu	e la Ición 222	Méx 2 D.F.	ico
									Showir	ng 1-1 of	1 items	12
Order This is a	Details a list of ord <i>uick Find</i>	er details.	🛋 New C	Order Detail	s Actions	Repor	t∨		View:	Order	Details	~
Product	: Name	Unit Price	Quantity [Discount Co	rder Custom ompany Nam	er Order Emplo Name	yee Last	Order Ship Via Company Name	Product Category Name	Produ Comp	uct Suppli bany Nam	er
Gudbra	andsdalsost	\$28.80	1	Ar 0 Er he	na Trujillo nparedados elados	y King	I	Federal Shipping	Dairy Products	Nors	ke Meierie	er
Outbac	:k Lager	\$12.00	5	Ar 0 Er he	na Trujillo nparedados elados	y King	I	Federal Shipping	Beverages	Pavlo	ova, Ltd.	
									Showir	ng 1-2 of	2 items	2

Select a child order detail. The record will be displayed in a modal form.

Order M	anager	
Quick Find	🔎 🖃 New Custo	mers 📝 Edit 🗙 Delete 🛛 Actions 🗸 🔹 Report 🗸 View: Customers 🗸
(i) A filter has be	en applied. Company Name	equals Ana Trujillo Emparedados y helados. X
Customer# Comp	oany Name 🍸 🦳 Contac Name	t Contact Title Address City Region Postal Country Phone
ANATR Ana	Review Order Details	×
y ne	Please review order details	s information below. Click Edit to change this record, click Delete to delete the record,
Orders	Order Details	diff bock.
This is a list of or	These are the fields of the	order details record that can be edited.
	Product Name *	Gudbrandsdalsost 🥢 🛋
🕦 A filter has b	Unit Price *	\$28.80
Employee Last	Quantity *	1
Name Y L	Discount *	0
King 9	Reference Information	
	Additional details about or	der details are provided in the reference information section.
Order Details This is a list of or	Order Customer Company Name	Ana Trujillo Emparedados y helados
Quick Find	Order Employee Last Name	King
Product Name	Order Ship Via Company Name	Federal Shipping
	Product Category Name	Dairy Products
Gudbrandsdalso:	Product Supplier Company Name	Norske Meierier
Outback Lager	👚 🦆 * - indicates a requ	ired field OK Delete Cancel

If a master data view enters "New" mode, the child data views will automatically become hidden.

For example, if a new customer is created, the data views *Orders* and *Order Details* will be invisible. If a new order is created, only *Order Details* data view will disappear.

Record V		View: New Customers
- indicates a required f	ield	OK Cance
lew Customers		
Complete the form. Mak	e sure to enter all required fields.	
Customer # *		
Company Name *		
Contact Name		
Contact Title		
Address		
City		
Region		
Postal Code		
Country		
Phone		
Fax		
- indicates a required f	ield	OK Cance

Rearranging Data Fields

The application generator composes this view of *Customers* from the database.

Home > 0 Orde	^{rder Manager} r Manage	r							
This is a list	of customers.								
Quick	Find 🔎 🛙	Rew Custo	mers Actions	✓ Report ∨				View: Cus	stomers 🗸
Customer#	Company Name	Contact Name	Contact Title	Address	City	Region	Postal Code	Country	Phone
ALFKI	Alfreds Futterkiste	Maria Anders	Sales Representative	Obere Str. 57	Berlin	n/a	12209	Germany	030- 0074321
ANATR	Ana Trujillo Emparedados y helados	Ana Trujillo	Owner	Avda. de la Constitución 2222	México D.F.	n/a	05021	Mexico	(5) 555- 4729
ANTON	Antonio Moreno Taquería	Antonio Moreno	Owner	Mataderos 2312	México D.F.	n/a	05023	Mexico	(5) 555- 3932

Let's change some of the data fields presented in the view. For example, let's move *Phone* data field next to *Contact Name*, remove the *Region* data field, and add *Fax* to the view.

Moving

Switch to the Project Designer. In the Project Explorer, activate the Controllers tab and expand to Order Manager / c101 / view1 / grid1 data view node. Drag Phone data field and drop it on the right side of ContactName data field to place it after the target.



Deleting

Right-click on Order Manager / c101 / view1 / grid1 / Region data field node, and select Delete.



Adding

Expand Customers / Fields node. Drag Fax field node onto Customers / Views / grid1 node to create a data field from the Fax field.



Switch to the Pages tab in the Project Explorer. Right-click on Order Manager page node, and press View in Browser.



The *Customers* grid with new column layout will be displayed. The *Phone* field is more conveniently placed next to the *Contact Name*. The *Region* field has been removed. *Fax* has been added.

Quick Find P Actions Report View: Customers Customers Customer# Company Name Contact Name Phone Contact Title Address City Postal Code Country Fax ALFKI Alfreds Futterkiste Maria Anders 030- 0074321 Sales Representative Obere Str. 57 Berlin 12209 Germany 030- 0076545 ANATR Ana Trujillo Helados Ana Trujillo (5) 555- 4729 Owner Avda. de la Constitución 2222 México D.F. 05021 Mexico (5) 555- 3745	This is a list	of customers.							
Customer # Company NameContact NamePhoneContact TitleAddressCityPostal CodeCountryFaxALFKIAlfreds FutterkisteMaria Anders030- 0074321Sales RepresentativeObere Str. 57Berlin12209 Germany030- 0076545ANATRAna Trujillo Emparedados y heladosAna Trujillo 4729(5) 555- 4729OwnerAvda. de la Constitución 2222México D.F.05021 Mexico 3745(5) 555- 3745	Quick Find ₽ ➡ New Customers Actions ∨ Report ∨ View: Customers ∨								
ALFKIAlfreds FutterkisteMaria Anders030- 0074321Sales RepresentativeObere Str. 57Berlin12209 Germany030- 0076545ANATRAna Trujillo Emparedados y heladosAna Trujillo (5) 555- 4729(5) 555- 4729OwnerAvda. de la Constitución 2222México D.F.05021 Mexico 05021 Mexico(5) 555- 3745ANTONAntonio Moreno Antonio MorenoAntonio (5) 555- (5) 555- OwnerMataderos 2312México México05023 Mexico D/a	Customer#	Company Name	Contact Name	Phone	Contact Title	Address	City	Postal Code Country	Fax
ANATR Ana Trujillo Emparedados y helados Ana Trujillo (5) 555- 4729 Owner Avda. de la Constitución 2222 México D.F. 05021 Mexico (5) 555- 3745 ANTON Antonio Moreno Antonio (5) 555- 4729 Owner Mataderos 2312 México 05023 Mexico n/a	ALFKI	Alfreds Futterkiste	Maria Anders	030- 0074321	Sales Representative	Obere Str. 57	Berlin	12209 Germany	030- 0076545
ANTON Antonio Moreno Antonio (5) 555- Owner Mataderos 2312 México 05023 Mexico n/a	ANATR	Ana Trujillo Emparedados y helados	Ana Trujillo	(5) 555- 4729	Owner	Avda. de la Constitución 2222	México D.F.	05021 Mexico	(5) 555- 3745
Taqueria Moreno 3932 D.F.	ANTON	Antonio Moreno Taquería	Antonio Moreno	(5) 555- 3932	Owner	Mataderos 2312	México D.F.	05023 Mexico	n/a

Designing Forms

Let's customize the forms on the Order Manager page.

Floating Category Data Fields

When a customer is selected, the data item is displayed in the form view *editForm1*. The form data fields are rendered top-down.

Please review customers information below. Click Edit to change this record, click Delete to delete the record, or click Cancel/Close to return back.						
Record 🗸				View:	Review Custon	ners 🗸
 * - indicates a requi Customers These are the fields of the organization 	red field customers record th	at can be edite	:d.	ОК	Delete (Cancel
Customer # * Company Name * Contact Name Contact Title Address City Region Postal Code Country Phone Fax	ALFKI Alfreds Futterkiste Maria Anders Sales Representat Obere Str. 57 Berlin 12209 Germany 030-0074321 030-0076545	ive]		
Image: Weight of and area OK Delete Cancel Orders This is a list of and area					Cancel	
Quick Find	New Orders	Actions ∨	Report 🗸		View: Or	ders 🗸
Employee Last Order I Name	Date Required Date	Shipped Date	Ship Via Company Name	Freight Ship Name	Ship Address	Ship City
Suyama 8/25/1	997 9/22/1997	9/2/1997	Speedy Express	\$29.46 Alfreds Futterkiste	Obere Str. 57	Berlin

Let's have the data fields displayed in a more compact fashion.

Switch back to the Project Designer. On the Pages tab of Project Explorer, double-click on Order Manager / c101 / view1 / editForm1 / c1 – Customers category node.



Change the *Float* property:

Property	Value
Float	Yes

Press OK to save the category. Right-click on Order Manager page node, and press View in Browser.



The data fields in *Customers* form view float from left to right and wrap when they reach the right side of the browser window which makes for a more compact presentation. If the browser window is resized, the form will resize as well.

Please review custom return back.	ers information b	elow. Click	Edit to chang	ge this record, dick D	elete to delete the	record, o	or click Cancel/Clo	ose to
New Customers	Actions 🗸	Report View: View:				Review Custo	mers 🗸	
Edit Delete Close Customers These are the fields of the customers record that can be edited.								
Customer#	Company Name		Cor	ntact Name	Contact Title			
ALFKI	Alfred	Alfreds Futterkiste		aria Anders	Sales Representative			
Address	City		Re	gion	Postal Code			
Obere Str. 57	Berlin		N/	A	12209			
Country	Phone		Fax	c				
Germany	030-00	074321 0		030-0076545				
1 🖡 🎒						Edit	Delete	Close
Orders								
This is a list of orders.								
Quick Find	P 🖃 Ne	w Orders	Actions ~	Report ∨			View: 0	rders v
Employee Last C Name	Order Date Req Date	uired	Shipped Date	Ship Via Company Name	Freight Ship N	ame	Ship Address	s Ship City
Suyama 8	3/25/1997 9/22	2/1997	9/2/1997	Speedy Express	\$29.46 Alfred Futter	s kiste	Obere Str. 57	Berlin

Configuring a Multi-Column Form

The picture below shows *editForm1* view of *Orders* data controller. Let's use categories to organize the data fields in multiple columns.

Orders Please review orders information below. Click Edit to change this record, click Delete to delete the record, or click Cancel/Close to return back.					
New Orders Ac	tions V Report	t v View: Review O	rders 🗸		
143		Edit Delete	Close		
Orders					
These are the fields of t	the orders record t	that can be edited.			
Employee Last Name	Suyama 🔘				
Order Date	8/25/1997				
Required Date	9/22/1997				
Shipped Date	9/2/1997				
Ship Via Company Nam	e Speedy Expre	ess O			
Freight	\$29.46				
Ship Name	Alfreds Futter	rkiste			
Ship Address	Obere Str. 57	,			
Ship City	Berlin				
Ship Region	N/A				
Ship Postal Code	12209				
Ship Country	Germany				
1 🖡 🎒		Edit Delete	Close		

In the *Project Explorer*, right-click on *Order Manager / c102 / view2 / editForm1* view node. Select *New Category* context menu option.
⊳ 🛅 Home					
a 📴 Order Manager					
⊳ 🛅 c10	1				
a 📄 c10.	2				
a 🗇 🗤	/iew2 (Orders, grid1) ->	view1			
Þ 📴	grid1				
⊳ि	editForm1				
Ľ	Open	Enter			
	List				
a 🛅 🤇 💑	Cut	Ctrl+X			
> 🛄 📭	Сору	Ctrl+C			
	Delete	Del			
	Rename				
> 🛅 E 🏤	Show View 'editForm:	1' in Controller			
⊿ 📴 C	Show All Categories				
	Show Styles				
▷ 💷 🎦	New Category				
Shippers					
Suppliers					
⊳ 🛅 Membership					

Assign the following properties:

Property	Value
Header Text	Shipping Info
Description	This is the shipping information.
New Column	Yes

Press OK to save the category.

In the *Project Explorer*, expand *Order Manager / c102 / view2 / editForm1 / c1 – Orders* category node. Select all data fields that start with "Ship-". Drag the data fields onto *c2 – Shipping Info* category node.



Right-click on Order Manager page node and select View in Browser.



Data fields on the Orders form will be split in two columns.

Orders

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

Rew Orders Actio	ns ∨ Report ∨		View: Review Orders 🗸	
Orders These are the fields of the	orders record that can be edited.	*	Shipping Info This is the shipping info	Edit Delete Close
Employee Last Name Order Date Required Date Shipped Date Ship Via Company Name Freight	Suyama 11/15/1996 12/13/1996 11/20/1996 Speedy Express \$41.95		Ship Name Ship Address Ship City Ship Region Ship Postal Code Ship Country	Around the Horn Brook Farm Stratford St. Mary Colchester Essex CO7 6JX UK
1 4 4				Edit Delete Close

Custom Category Template

The Order Details layout of editForm1 view created by the application generator is shown below.

Please review order detai Cancel/Close to return ba	ls information below. Click Edit to change this record, click Delete to delete the record, or click ck.	
Order Details These are the fields of th	e order details record that can be edited.	
Product Name	Rössle Sauerkraut 🛇	
Unit Price	\$45.60	
Quantity	15	
Discount	0.25	
Reference Informatio	n	
Additional details about o	rder details are provided in the reference information section.	
Order Customer Company Name	Alfreds Futterkiste	
Order Employee Last Name	Suyama	
Order Ship Via Company Name	Speedy Express	
Product Category Name	Produce	
Product Supplier Company Name	Plutzer Lebensmittelgroßmärkte AG	

Let's create a custom layout for the first category in *Order Details* form. In the *Project Explorer*, right-click on *Order Manager / c103* container node, and select *New Control*.



Next to the User Control property lookup, activate the New User Control icon.



Assign a name to the user control.

Property	Value
Name	OrderDetails_CustomCategoryTemplate

Press OK to insert the new user control into the User Control property, and press OK again to save the control.

On the *Project Designer* toolbar, press *Generate*. When complete, right-click on *Order Manager / c103 / control1* node, and press *Edit in Visual Studio*.

D 🛅 Home						
a 📴 Order M	a 🛅 Order Manager					
⊳ 🛅 c101	L					
⊳ 🛅 c102	2					
a 📄 c103	3					
⊳ 🗖 v	iew3 (Order	Details, grid1) ->	view2			
⊳ <u>III c</u>	ontrol1 - Or	derDetails_Custo	mCategoryTemplate			
4 🛅 C 📑	Open	Enter				
▷ 🛄 🛷	Edit in Vis	ual Studio				
	List					
⊳ 🛅 👗	Cut	Ctrl+X				
Þ 🛅 🗗 📭	Сору	Ctrl+C				
4 ∎C ×	Delete	Del				
	Rename					
	> 🔄 🚒 Show User Control					
⊳ l≊l Sµµe	15					

The template file will open in *Visual Studio*. On the menu, select *Edit* | *Advanced* | *Format Document*. Replace everything after the <% Control %> element with the following:

```
<div style="display: none;">
  <div id="OrderDetails_editForm1_c1">
     >
          Product:
          <span class="FieldPlaceholder DataOnly">{ProductID}</span>
          Discount:
          <span class="FieldPlaceholder DataOnly">{Discount}</span>
          >
          Unit Price:
          <span class="FieldPlaceholder DataOnly">{UnitPrice}</span>
          Quantity:
          <span class="FieldPlaceholder DataOnly">{Quantity}</span>
          </div>
</div>
```

Save the file.

Refresh the web browser page and select a customer, order, and order detail data rows. The first category of *editForm1* view of *Order Details* data controller will be rendered using the new template.

Cancel/Close to return bac	information below. Click Edit to change this record, click Delete to delete the record, or click
Order Details	
These are the fields of the	order details record that can be edited.
Product: Röss Unit Price: \$45.6	le Sauerkraut i Discount: 0.25 0 Quantity: 15
Reference Information Additional details about or	der details are provided in the reference information section.
Order Customer Company Name	Alfreds Futterkiste
Order Employee Last Name	Suyama
Order Ship Via Company	Speedy Express
Name	
Name Product Category Name	Produce
Name Product Category Name Product Supplier Company Name	Produce Plutzer Lebensmittelgroßmärkte AG

Configuring Charts

Let's create a chart that will graphically present orders broken down by quarter.

Creating the View

Start the Project Designer. In the Project Explorer, activate the Controllers tab. Right-click on Orders / Views node, and press New View.



Give this view the following properties:

Property	Value		
Id	OrdersByQuarter		
Туре	Chart		
Label	Orders By Quarter		

Press OK to save the view.

A chart requires at least two fields. One field will represent the values, and the other will form the *x*-axis of the chart that will group values by a certain criteria. A chart may have more than one field representing values.

For example, to display a chart of orders grouped by quarter, the *OrderID* field will represent values and *OrderDate* will represent the *x*-axis.

In the *Project Explorer*, expand the *Orders / Fields* node. Using *Ctrl* key, select *OrderID* and *OrderDate* fields, and drag them onto *Orders / Views / OrdersByQuarter* view node.



This will create two data fields. Double-click Orders / Views / OrdersByQuarter / OrderID data field node.



Assign the following values:

Property	Value
Aggregate	Count
Chart	Bar (Cylinder)

Press OK to save the data field. Double-click Orders / Views / OrdersByQuarter / OrderDate data field node.



Assign these values:

Property	Value
Data Format String	МММ ууу
Chart	X, Quarter

Press OK to save.

Viewing the Results

On the Project Designer toolbar, press Browse.

Navigate to the Order Manager page. Select a customer from the first data view. Use the View Selector in the top right corner of Orders data view to switch to Orders By Quarter view.

This is a list of c	customers.								
Quick Find	¢ p	📑 New C	ustomers	🎝 Edit	igak Delete	Actions 🗸	$Report \lor$	View: Cu	stomers 🗸
i A filter has	A filter has been applied. Company Name equals Alfreds Futterkiste.								
Customer# Cor	mpany Name '	Contact Name	Phone	Cont	act Title A	ddress	City	Postal Code Country	Fax
ALFKI Alfi	reds Futterkis	te Maria Anders	030- 007432	Sales 1 Repr	s resentative	bere Str. 57	Berlin	12209 Germany	030- 0076545
								Showing 1-1 o	f 1 items 🥏
Orders This is a list of c	orders.	-							
Quick Find	م ر	📑 New O	rders Ac	tions 🗸	Report 🗸			View:	Orders 🗸
Employee Last Name	Order Date	Required Date	Shipped Date	Ship Via Company	Name Freig	ght Ship Name		 Orders Orders By 	/ Quarter
Suyama	8/25/1997	9/22/1997	9/2/1997	Speedy Express	\$29.	.46 Alfreds Fut	tterkiste	Obere Str. 57	Berlin
Peacock	10/3/1997	10/31/1997	10/13/1997	, United Package	\$61.	.02 Alfred's Fu	tterkiste	Obere Str. 57	Berlin
Peacock	10/13/1997	11/24/1997	10/21/1997	Speedy Express	\$23.	.94 Alfred's Fu	tterkiste	Obere Str. 57	Berlin
Davolio	1/15/1998	2/12/1998	1/21/1998	Federal Shipping	\$69.	.53 Alfred's Fu	tterkiste	Obere Str. 57	Berlin
Davolio	3/16/1998	4/27/1998	3/24/1998	Speedy Express	\$40.	.42 Alfred's Fu	tterkiste	Obere Str. 57	Berlin
«Previous Pa	age: 1 2 N	lext »			Item	s per page: 5,	10, 15, 20, 2	25 Showing 1-5 o	f 6 items 🥏

The chart will be displayed, showing the number of orders in each quarter filtered by the selected customer.



If you select another customer, the orders will change to reflect the new selection.



Creating Many-to-Many Fields

The Northwind database features a many-to-many relationship between Territories and Employees.



The app generator will create a page for *EmployeeTerritories* that allows editing records directly.

Home > Employees > Employee Territories Employee Territories					
This is a list of employee	e territories.				
Quick Find	P ■ New Actions ∨	Report 🗸	View: Employee Territories 🗸		
Employee Last Name		Territo	y Description		
Davolio		Wilton			
Davolio		Neward	I		
Fuller		Westb	ro		

EmployeeTerritories is also available as a child data view on the *Employees* page. Selecting an employee will reveal a list of related territories.

This is a list of employe	ees.							
Quick Find	🔎 🛋 New E	mployees	🏓 Edit 🛛 🗙 D	elete Act	tions 🗸 Report 🗸	View:	Employe	es 🗸
i A filter has been a	applied. First Name e	quals Nancy.						x
Last Name First Name 🍸	Title	Title Of Courtesy	Birth Date	Hire Date	Address	City	Region	Postal Code
Davolio Nancy	Sales Representative	Ms.	12/8/1948	5/1/1992	507 - 20th Ave. E. Apt. 2A	Seattle	WA	98122
						Showing 1	1 of 1 iter	ms 🥏
Employees Ord	ers Employee	Territories						
This is a list of employ	ee territories.							
Quick Find	🔎 🖃 New	Actions \lor	Report ∨		View:	Employee	Territori	es 🗸
Territory Description								
Wilton								~
Neward								
						Showing 1	-2 of 2 iter	ms 🥏

Let's create a many-to-many field on the employee edit form that will allow selecting territories in a check box list. Each option in the list will represent a territory from the *Territories* table. The checkbox next to the territory name will be checked if there is a record in the *EmployeeTerritories* table linking the selected employee with the territory. The relevant *EmployeeTerritories* records will be inserted or deleted when the user changes the selection of checkboxes and saves the employee record.

Start the Project Designer. In the Project Explorer, switch to the Controllers tab. Right-click on Employees / Fields node, and press New Field.



Give this field the following values:

Property	Value
Name	Territories
Allow null values	true
The value of this field is computed at run-time by SQL expression.	true
Label	Territories
Items Style	Check Box List

Items Data Controller	Territories
Data Value Field	TerritoryId
Data Text Field	TerritoryDescription
Target Controller	EmployeeTerritories

Press OK to save the field.

Drag Employees / Fields / Territories field node onto Employees / Views / editForm1 view node.



Double-click on Employees / Views / editForm1 / Territories data field node.



Change the Columns property:

Property	Value					
Columns	5					

Press OK to save. Switch to the Pages tab. Right-click on Employees page node, and press View in Browser.



View the details for an employee. *Territories* field will display a comma-separated list of values associated with the employee.

Employees

These are the fields of the employees record that can be edited.

Last Name	Davolio
First Name	Nancy
Title	Sales Representative
Title Of Courtesy	Ms.
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 O
Photo Path	http://accweb/emmployees/davolio.bmp
Territories	Neward , Wilton
1 🖡 🛃	Edit Delete Close

Press *Edit* button. All territories will be rendered as a check box list.

Photo	
	Click <u>here</u> to upload or clear employees photo file.
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/emmployees/davolio.bmp
Territories	🗌 Atlanta 🔹 Cary 🔹 Hoffman Estates 💭 Philadelphia 👘 Santa Monica
	Austin Chicago Hollis Phoenix Savannah
	Beachwood Colorado Springs Louisville Portsmouth Scottsdale
	Bedford Columbia Mellvile Providence Seattle
	Bellevue Dallas Menlo Park Racine Southfield
	Bentonville Denver Minneapolis Redmond Tampa
	Bloomfield Hills Edison Morristown Rockville Troy
	Boston Fairport New York Roseville Westboro
	🗌 Braintree 📄 Findlay 📄 New York 📄 San Francisco 🗹 Wilton
	🗌 Cambridge 📃 Georgetow 📝 Neward 💭 Santa Clara
	Campbell Greensboro Orlando Santa Cruz
👚 🦺 * - indicates a requ	ired field OK Delete Cancel

Check or uncheck several values, and press OK to save the record. Select the record to verify that the changes were persisted.

Changing the Child Views

The Employee Territories child data view is now unnecessary.

Switch back to the *Project Designer*. In the *Project Explorer*, right-click on *Employees / container2 / view4* node, and press *Delete*.



Drag view3 node on the left side of view2 to place it in the first position.



Right-click on *Employees* page node, and press *View in Browser*.



Select an employee from the list, and the *Orders* and *Employees* child data view tabs will appear below. The *Employee Territories* child data view tab is no longer present. The picture also shows the many-to-many field *Territories* in the master grid view.

This is a list	of employe	es.											
Quick I	Find	Q	🛋 New	Employ	yees 🛛	🏓 Edit	🗙 Dele	te Actio	ons 🗸	Report V	· Vi	iew: En	nployees 🗸
🔃 A filter l	nas been aj	pplied. F	First Name	equal	s Nancy.								x
Last Name	First Name 🍸	Title		Title O Courte	of Birth Birth I	Date H	lire Date	Address	City	/ Reg	_{jion} Postal Code	Territor	ries
Davolio	Nancy	Sales Repres	sentative	Ms.	12/8/	1948 5	/1/1992	507 - 20ti Ave. E. A 2A	n pt. Sea	ittle WA	98122	Neward	d , Wilton
											Show	ing 1-1 (of 1 items 🤹
Orders	Employe	es											
This is a list	of orders.												
	Find	Q	🛋 New	Order	s Actio	ns 🗸	Report ∨					View	: Orders 🗸
Customer C Name	ompany	Order Date	Requ Date	ired	Shipped Date	Ship Name	Via Compan	^{IY} Freigh	t Ship N	lame	Ship Ad	dress	Ship City
Ernst Hand	el	7/17/19	996 8/14/	1996	7/23/199	6 Spee Expre	dy ess	\$140.5	1 Ernst	Handel	Kirchga	sse 6	Graz
Wartian He	rkku	8/1/199	96 8/29/	1996	8/2/1996	Spee Expre	dy ess	\$136.5	4 Wartia	an Herkku	Torikatı	u 38	Oulu
Magazzini A Riuniti	Alimentari	8/7/199	96 9/4/1	996	8/9/1996	Spee Expre	dy ess	\$26.9	3 Magaz Alimer	zzini ntari Riuniti	Via Lude Moro 22	ovico il 2	Bergamo
QUICK-Stop	P	8/20/19	996 9/17/	1996	8/26/199	6 Unite Packa	d age	\$76.8	3 QUIC	K-Stop	Tauche	rstraße	10 Cunewalde
Tradição Hipermerca	dos	8/28/19	996 9/25/	1996	9/2/1996	Unite Packa	d age	\$1.3	5 Tradiç Hiperr	ao nercados	Av. Inê Castro,	s de 414	Sao Paulo
« Previous	Page: 1	2 3 4	567	. 25	Next »		Item	s per page	e: 5 , 10,	15, 20, 25	5 Showing	1-5 of	123 items 🧣

Creating Calculated Fields

The picture below shows the Order Details form in edit mode.

	Employee Last Dequired Shinned Shin Via					
Review Order Deta	ails X					
Please review order details information below. Click Edit to change this record, click Delete to delete the record, or click						
Cancel/Close to return back.						
Order Details	of the order details record that can be edited					
These are the fields to						
Product:	Rössle Sauerkraut 🥢 🛋 Discount: 0.25					
Unit Price:	45.60 Quantity: 15					
Reference Inform	ation					
Additional details abo	ut order details are provided in the reference information section.					
Order Customer	Alfreds Futterkiste					
Order Employee Las	t Suvama					
Name	c Soyana					
Order Ship Via Comp Name	any Speedy Express					
Product Category Na	ame Produce					
Product Supplier Company Name	Plutzer Lebensmittelgroßmärkte AG					
🏠 🐥 * - indicates a	required field OK Delete Cancel					
-						
	i ditte nate					

Let's create a calculated field called *Extended Price* that will display the extended price of the Order Details item.

Calculated fields are also known as *virtual* fields. The field value is not stored in the database - it is calculated at runtime based on values of other fields in the data row.

Creating the virtual Field

Activate the Project Designer. In the Project Explorer, switch to the Controllers tab. Right-click on OrderDetails / Fields node, and press New Field.



Assign the following values:

Property	Value
Name	ExtendedPrice
Туре	Currency
Label	Extended Price
Allow Query-by-Example	true
Allow Sorting	true

Press OK to save. Drag OrderDetails / Fields / ExtendedPrice node onto OrderDetails / Views / grid1 node to bind the field to the view grid1.



Drag OrderDetails / Fields / ExtendedPrice node onto OrderDetails / Views / editForm1 / c1 – Order Details node to bind the field to view editForm1.



Finally, drag OrderDetails / Fields / ExtendedPrice node onto OrderDetails / Views / createForm1 node.



A binding of field to a view is called a data field.

On the toolbar, press *Browse* and navigate to the *Order Manager* page. The *Extended Price* data field is visible in the grid and in the form views of *Order Details*. However, the field is rendered as blank.

Order Details This is a list of order of	details.							
Quick Find	ρ Record \vee						View: Ord	er Details 🗸
Product Name	Unit Price Quantity	Discount	Order Customer Company Name	Order Employee Last Name	Order Ship Via Company Name	Product Category Name	Product Supplier Company Name	Extended Price
Rössle Sauerkraut 🥢 🚅	\$45.60 15	0.25	Alfreds Futterkiste	Suyama	Speedy Express	Produce	Plutzer Lebensmittelgroßmärkte AG	
Save Cance	el							

Note that if you have a custom category template associated with the form view, then the field will not be visible automatically. In that case, the custom category template for *editForm1* needs to be updated to display the data field.

Read the next section to learn how to include the new virtual data field in the template, or skip to the following section discussing how to provide an SQL Formula for the field.

Updating the Custom Category Template

Switch to the *Project Designer*. In the *Project Explorer*, switch to the *Pages* tab. Right-click on *Order Manager / c103 / control1* node and press *Edit in Visual Studio*.



The template file will be opened in *Visual Studio*. Replace the existing code after the <% Control %> element with the following:

```
<span class="FieldPlaceholder DataOnly">{ProductID}</span>
          Discount:
          <span class="FieldPlaceholder DataOnly">{Discount}</span>
          >
          Unit Price:
          <span class="FieldPlaceholder DataOnly">{UnitPrice}</span>
          Quantity:
          <span class="FieldPlaceholder DataOnly">{Quantity}</span>
          <i>Extended Price:</i>
          <span class="FieldPlaceholder DataOnly">{ExtendedPrice}</span>
          </div>
</div>
```

Save the file, and refresh the webpage. The Extended Price data field will be displayed in edit form.

Please review order details	information below. C					I
Please review order details information below. Click Edit to change this record, click Delete to delete the record, or click Cancel/Close to return back. Order Details These are the fields of the order details record that can be edited.						
Product: Rössle Sauer Unit Price: \$45.60	e rkraut 🥢 📑	Discount: Quantity:	0.25	Extended Price:		
Reference Information Additional details about orde	ler details are provide	d in the refere	nce information section.			
Order Customer Company Name	Alfreds Futterkiste					
Order Employee Last Name	Suyama					
Order Ship Via Company Name	/ Speedy Express					
Product Category Name	Produce					- 1
Product Supplier Company Name	Plutzer Lebensmittel	großmärkte AG				
Image: Weight of the state						

SQL Formula

Let's provide an SQL expression evaluated when the data rows of order details are selected from the database.

In the Project Explorer, switch to the Controllers tab and double-click on OrderDetails / Fields / ExtendedPrice node.



Change the following:

Property	New Value
The value of this field is computed at run-time by SQL expression.	true
SQL Formula	OrderDetails.UnitPrice * OrderDetails.Quantity * (1 - OrderDetails.Discount)
Values of this field cannot be edited	true
Data Format String	С

Press *OK* to save the field. On the toolbar, press *Browse*. The *Extended Price* field will not be editable, and the value will be presented when the form is rendered.

Order Details These are the fields of the order details record that can be edited.					
Product: Unit Price:	Rössle Sauerkraut 🥢 🛋	Discount: Quantity:	0.25	Extended Price: \$513.00	

SQL Formula provides the highest possible performance for the calculation since it is being evaluated by the database engine. The complexity of calculated fields depends on the capabilities of the database engine. There are numerous built-in functions that the developer can take advantage of.

Fields based on SQL Formula can be sorted and filtered with the highest possible performance as well.

Calculating Field Values Just-in-Time

Extended Price is not recalculated when a user changes values of Unit Price, Discount, or Quantity fields.

Order Details These are the fields of the order details record that can be edited.				
Product: Unit Price:	Rössle Sauerkraut 🥢 🛋	Discount: Quantity:	0.25	Extended Price: \$513.00

The *SQL Formula* of the *Extended Price* field is evaluated only when the data is selected from the database. If the user makes changes in the browser window, the values will not be submitted to the server until the record is saved. Developers can implement a server-side or client-side calculation that will be performed just-in-time as users change the values of the formula's base fields.

The application framework includes a business rule engine that allows implementing rules in SQL, C#/Visual Basic, or JavaScript.

SQL and C#/Visual Basic business rules require a round-trip between the web browser and the web server. They can look up database information and interact with external systems when necessary.

JavaScript business rules are executed in the browser and provide the highest possible performance when serverside data is not required for calculation.

Let's consider implementing the calculation using all three flavors of business rules. Note that the developer needs only one of them to accomplish just-in-time calculation of *Extended Price*.

SQL Business Rule

In the *Project Explorer*, double-click on *OrderDetails / Fields / ExtendedPrice* node.

 W Commands Fields OrderID* (Int32) -> Orders OrderCustomerID (String(5), read-only) -> Customers 	a 🔩 OrderDetails
▲ I Fields I OrderID* (Int32) -> Orders OrderCustomerID (String(5), read-only) -> Customers	Que Commands A second sec
OrderID* (Int32) -> Orders OrderCustomerID (String(5), read-only) -> Customers	a 🧇 Fields
Q OrderCustomerID (String(5), read-only) -> Customers	VorderID* (Int32) -> Orders
y oracreasionene (string(s), read only) y castomers	💫 OrderCustomerID (String(5), read-only) -> Customers
IntercustomerCompanyName (String(40), read-only)	OrderCustomerCompanyName (String(40), read-only)
Intersection of the section of th	OrderEmployeeLastName (String(20), read-only)
Interstitution of the state	OrderShipViaCompanyName (String(40), read-only)
ProductID* (Int32) -> Products	ProductID* (Int32) -> Products
ProductProductName (String(40), read-only)	ProductProductName (String(40), read-only)
ProductCategoryCategoryName (String(15), read-only)	ProductCategoryCategoryName (String(15), read-only)
ProductSupplierCompanyName (String(40), read-only)	ProductSupplierCompanyName (String(40), read-only)
12 UnitPrice* (Decimal)	12 UnitPrice* (Decimal)
12 Quantity* (Int16)	12 Quantity* (Int16)
12 Discount* (Single)	12 Discount* (Single)
▶→ ExtendedPrice* (Currency)	ExtendedPrice* (Currency)

Make the following changes:

Property	New Value
The value of this field is calculated by a business rule expression.	true
Context Fields	UnitPrice, Quantity, Discount

Press OK to save. Right-click on OrderDetails / Business Rules node, and press New Business Rule.



Assign these values:

Property	Value
Туре	SQL
Command Name	Calculate
Phase	Execute
Script	<pre>set @ExtendedPrice = @UnitPrice * @Quantity * (1 - @Discount)</pre>

Press OK to save. On the toolbar, press Browse. Select and start editing an Order Details record.

Order Details These are the fields of the order details record that can be edited.				
Product:	Rössle Sauerkraut 🥢 🚔	Discount:	0.25	
Unit Price:	\$45.60	Quantity:	15	Extended Price: \$513.00

Change the value in *Quantity* field. Press *Enter* or shift the focus to a different field. The *Extended Price* will be updated.

Order Details These are the fields of the order details record that can be edited.					
Product: Unit Price:	Rössle Sauerkraut 🥢 🛋	Discount: Quantity:	0.25	Extended Price: \$547.20	

The client library executes *Calculate* action, which causes transfer of field values to the server. The application framework will pass the business rule script along with the parameter values to the database engine for execution. Then, it evaluates parameters and returns changed values to the client web browser.

SQL business rules involve client, application server, and database engine tiers. The advantage of SQL business rules is the ability to access any database information when necessary.

Code Business Rule

The business rule can also be implemented using C# or Visual Basic.

If you have the SQL business rule created in the previous section, then you will need to delete or rename the business rule. Double-click on *OrderDetails / Business Rules / Calculate* node.



Change the Command Name property:

Property	Value
Command Name	DoNotRun

Press OK to save. Alternatively, business rule r100 can be deleted.

Right-click on OrderDetails / Business Rules node, and press New Business Rule.



Assign these values:

Property	Value
Туре	C# / Visual Basic
Command Name	Calculate
Phase	Execute

Press OK to save.

Code business rule files do not exist until the application generator has created them. On *Project Designer* toolbar, press *Browse*.

When complete, right-click OrderDetails / Business Rules / Calculate business rule node, and press Edit Rule in Visual Studio.



The file will be opened in *Visual Studio*. The entire class definition and parameters of the business rule method are already defined.

Replace the body of the rule with the call of *UpdateFieldValue* method:

```
C#:
using System;
using MyCompany.Data;
namespace MyCompany.Rules
{
    public partial class OrderDetailsBusinessRules : MyCompany.Data.BusinessRules
    {
        [Rule("r101")]
        public void r101Implementation(int? orderID,
            string orderCustomerID, string orderCustomerCompanyName,
            string orderEmployeeLastName, string orderShipViaCompanyName,
            int? productID, string productProductName, string productCategoryCategoryName,
            string productSupplierCompanyName, decimal? unitPrice, short? quantity,
            float? discount, decimal? extendedPrice)
        {
            UpdateFieldValue("ExtendedPrice",
                Convert.ToDouble(unitPrice.Value) * quantity.Value * (1 - discount.Value));
        }
    }
}
Visual Basic:
Imports MyCompany.Data
Imports System
Namespace MyCompany.Rules
    Partial Public Class OrderDetailsBusinessRules
        Inherits MyCompany.Data.BusinessRules
        <Rule("r101")> _
        Public Sub r101Implementation(
                ByVal orderID As Nullable(Of Integer),
                ByVal orderCustomerID As String,
                ByVal orderCustomerCompanyName As String,
                ByVal orderEmployeeLastName As String,
                ByVal orderShipViaCompanyName As String,
                ByVal productID As Nullable(Of Integer),
                ByVal productProductName As String,
                ByVal productCategoryCategoryName As String,
                ByVal productSupplierCompanyName As String,
                ByVal unitPrice As Nullable(Of Decimal),
                ByVal quantity As Nullable(Of Short),
                ByVal discount As Nullable(Of Single),
                ByVal extendedPrice As Nullable(Of Decimal)
            UpdateFieldValue("ExtendedPrice",
                Convert.ToDouble(unitPrice.Value) * quantity.Value * (1 - discount.Value))
```

```
End Sub
```

End Class End Namespace

Save the file, and refresh the webpage.

The same behavior as with the SQL business rule will be exhibited every time a context field is changed in the form. The client library will make a short trip to the web server to perform the calculation. The application framework will call the business rules class method which is linked to the business rule defined in *OrderDetails* data controller.

JavaScript Business Rule

If the values of the base fields are known on the client at the time when a calculation needs to be performed, then the web server round-trip is redundant. JavaScript business rules offer an option to implement complex logic executed by the web browser.

First, disable execution of the previously created C#/Visual Basic business rule. Double-click on OrderDetails / Business Rules / Calculate node.



Change the Command Name property:

Property	Value
Command Name	DoNotRun

Press OK to save. Alternatively, business rule r101 can be deleted.

Right-click on OrderDetails / Business Rules node, and press New Business Rule.



Assign these values:

Property	Value
Туре	JavaScript
Command Name	Calculate
Phase	Execute
Script	<pre>[ExtendedPrice] = [UnitPrice] * [Quantity] * (1 - [Discount]); this.preventDefault();</pre>

At runtime, the client library will automatically translate the script into the following JavaScript code:

```
this.updateFieldValue('ExtendedPrice',
    this.selectFieldValue('UnitPrice') *
    this.selectFieldValue('Quantity') *
    (1 - this.selectFieldValue('Discount')));
this.preventDefault();
```

Press OK to save. On the toolbar, press Browse. Open the form view of an order detail.

Order Details These are the fields of the order details record that can be edited.				
Product:	Rössle Sauerkraut 🥢 🛋	Discount:	0.25	
Unit Price:	\$45.60	Quantity:	15	Extended Price: \$513.00

Change a value in one of the fields. Press *Tab* to shift focus away from the field. The *Extended Price* will automatically be updated without performing a server request.

Order Details These are the fields of the order details record that can be edited.				
Product:	Rössle Sauerkraut 🖉 📑	Discount:	0.3	
Unit Price:	\$45.60	Quantity:	15	Extended Price: \$478.80

The call of the method *preventDefault()* will prevent the client library from processing the *Calculate* action on the server.

Implementing a Custom Action

Let's implement a custom action that will apply a discount to all line items of a specific order. Orders are stored in the table *Orders*, and line items are stored in *Order Details*.

Orders							
Column Name	Data Type	Allow Nulls					
💡 OrderID	int						
CustomerID	nchar(5)	V					
EmployeeID	int	V					
OrderDate	datetime	V		Or	der Details		
RequiredDate	datetime	V			Column Name	Data Type	Allow
ShippedDate	datetime	V		8	OrderID	int	
ShipVia	int	V		8	ProductID	int	
Freight	money	V	∞		UnitPrice	money	
ShipName	nvarchar(40)	V			Quantity	smallint	
ShipAddress	nvarchar(60)	V			Discount	real	
ShipCity	nvarchar(15)	V					
ShipRegion	nvarchar(15)	V					
ShipPostalCode	nvarchar(10)	V					
ShipCountry	nvarchar(15)	V					

Adding a Custom Action

First, an action needs to be defined in the action group of a data controller.

Start the Project Designer. In the Project Explorer, switch to the Controllers tab. Right-click on Orders / Actions / ag4 (ActionBar) – Edit/Delete action group node, and press New Action.

a 🔩 Orders					
⊳ 👯 Cor	🛛 🐙 Commands				
🕞 🔈 🛛 🔊	ds				
Viev	WS				
a 🧇 Act	ions				
▶ ⊡ ag1 (Grid)					
⊳ 🔤 ag2 (Form)					
⊳ 🔤 ag3 (ActionBar) - New					
aq4 (ActionBar) - Edit/Delete					
▷ 🗋	Open	Enter			
▷ 8==	List				
⊳ 👗	Cut	Ctrl+X			
a 🖓	Сору	Ctrl+C			
▷ 😤 PI 🗙	Delete	Del			
⊳ 😤 SI	Rename				
⊳ ≁≴ St					
⊳ ¶\$ Te	Show All Actions				
New Action					

Assign the following values:

Property	Value
Command Name	Custom
Command Argument	ApplyDiscount
Header Text	Apply a Discount
When Key Selected	Yes
Confirmation	_controller= <mark>OrderDiscount</mark> _title=Specify a Discount _width=500

Press OK to save the action.

The Confirmation property references a data controller called "OrderDiscount". This data controller does not exist in the project – we will create this confirmation data controller from scratch and have it configured to collect the *Discount* value from the user. The data controller will not be based on any database table or view.

Creating the Confirmation Controller

On the Project Explorer toolbar, press the New Controller icon.
🔮 🗚 🙆 🤫 🗂 💷
 A Categories A Custom New Controller A Employees

Give this controller a name:

Property	Value
Name	OrderDiscount

Press OK to save.

Right-click on OrderDiscount / Fields node, and press New Field.



Assign the following values:

Property	Value
Name	CustomerCompanyName
Туре	String
Length	50
The value of this field is calculated by a business rule expression.	True
Label	Customer Company Name
Values of this field cannot be edited	True

Press OK to save.

Add another field with these values:

Property	Value
Name	Discount
Туре	Single
Label	Discount

Save the field.

Generate the app and select an order. On the action bar, press the *Apply a Discount* action.

This is a list of or	ders.									
Quick Find	Q	🛋 New Ord	ders 📝	Edit 🗙 (Delete A	Apply a	a Discoun	t Actions	✓ Report ✓ Vie	w: Orders
Customer Company Name	Employee Last Name	Order Date	Required Date	Shipped Date	Ship Via Company Name		Freight	Ship Name	Ship Address	Ship Ci
Vins et alcools Chevalier	Buchanan G	7/4/1996	8/1/1996	7/16/1996	Federal Shipping	0	\$32.38	Vins et alcools Chevalier	59 rue de l'Abbaye	Reims

A modal form with two empty fields, *Customer Company Name* and *Discount*, will be displayed.

Specify a Discount		x
Customer Company Name Discount *	N/A	
* - indicates a required f	ield	OK Cancel

Let's populate *Customer Company Name* with the name of the company associated with the selected order and initialize *Discount* with the average discount of the order details.

In the Project Explorer, right-click on OrderDiscount / Business Rules node, and press New Business Rule.

a 🝓 OrderDiscount									
University of the second se									
⊿ 🧇 Fields									
String(50), read-only									
12 Discount* (Single)									
Views									
> 🧇 Actions									
Business Rules									
⊳ 🔧 📰 List									
New Business Rule									

Assign the following values:

Property	Value
Туре	SQL
Command Name	New
Phase	Execute
Script	<pre>set @CustomerCompanyName = @Context_CustomerCompanyName select @Discount = avg(Discount) from "Order Details" where OrderID = @Context_OrderID</pre>

Press OK to save the business rule.

The parameter @CustomerCompanyName refers to the *CustomerCompanyName* field of the confirmation data controller.

The parameter <code>@Context_CustomerCompanyName</code> refers to the *CustomerCompanyName* field of the *Orders* data controller.

The application framework will pass the script for execution to the database engine when the action *Custom / ApplyDiscount* is activated by the user. The result is shown in the next screenshot.

Specify a Discount		x
Customer Company Name Discount *	Chop-suey Chinese	
* - indicates a required fie	eld	OK Cancel

If the user clicks *OK*, nothing will happen. The application does not know what to do with a "Custom" action with argument of "ApplyDiscount".

Creating an SQL Business Rule to Handle the Action

Now that an action and controller are in place to capture the user input, a business rule needs to be created to apply the specified discount to all *OrderDetails* data rows associated with the selected order.

Right-click on Orders / Business Rules node, and press New Business Rule.



Use these values:

Property	Value
Туре	SQL
Command Name	Custom
Command Argument	ApplyDiscount
Phase	Execute
Script	<pre> apply discount to order details update "Order Details" set Discount = @Parameters_Discount where OrderID = @OrderID</pre>

force refresh of child views
<pre>set @Result_RefreshChildren = 1</pre>

Press OK to save.

The first statement in the SQL script will update [Order Details].[Discount] column where the OrderID matches the selected order. The value of the discount is referenced by @Parameters_Discount parameter.

The second statement instructs the client library to refresh the child data views of the master data view *Orders*. This will cause *Order Details* data view to reflect the updated discount.

On the *Project Designer* toolbar, press *Browse*. Navigate to the *Orders* page and select an order. A list of related order details will be displayed below. Take note of the discounts of the order details.

This is a list of or	rders.											
Quick Find	Q	📑 New	Orders	🗾 Ed	it 🗙	Delete	Apply a Dis	scount	Actions 🗸	Report ∨	View:	Orders v
(i) A filter has b	een applied.	Order Date	e equals i	7/11/19	9 96 .							×
Customer Company Name	Employee Last Name	Order Date 🍸	Requi Date	red Ship Dat	oped œ	Ship Via Company Name	/ Freig	ht Ship	Name Ship	Address		Ship City
Chop-suey Chinese	Buchanan 🤇	7/11/19	96 8/8/1	996 7/2	3/1996	United Package	O \$22.9	98 Choj Chin	p-suey Hau Jese	ptstr. 31		Bern
										Showing	g 1-1 o	f 1 items 🧣
Order Details	;											
This is a list of o	rder details.											
Quick Find	Q	🖃 New	Order De	tails	Actions	✓ Rep	port 🗸			View:	Orde	r Details 🗸
Product Name	Unit Price Qu	uantity Dis	scount C N	rder ustomer ompany ame	Or Em La	der nployee st Name	Order Shij Via Compa Name	p Pr any Ca Na	oduct ategory ame	Product Sup Company Na	plier E ime	xtended Price
Guaraná Fantástica	\$3.60	15	0.15 C	hop-suey hinese	^y Bu	ichanan	United Package	Be	everages	Refrescos Americanas LTDA		\$45.9
Pâté chinois	\$19.20	21	0.15 C	hop-suey hinese	^y Bu	ichanan	United Package	M	eat/Poultry	Ma Maison		\$342.7
Longlife Tofu	\$8.00	21	0 C	hop-suey hinese	^y Bu	ichanan	United Package	Pr	oduce	Tokyo Trade	rs	\$168.0
										Showing	g 1-3 o	f 3 items 🧲

On the action bar of *Orders* grid view, press *Apply a Discount*. The confirmation modal popup will appear, displaying the current *Customer Company Name* and the average discount. Enter a discount of ".25".

Specify a Discount		×
Customer Company Name Discount *	Chop-suey Chinese	
* - indicates a required fie	eld	OK Cancel

Press *OK*, and the specified discount will be applied to all records in *Order Details* table that belong to the selected order.

Order Det	ails											
This is a list (This is a list of order details.											
Quick F	ind	Q	- 71	New Ord	er Details	Act	tions 🗸	Rep	ort 🗸		View: Or	der Details 🗸
Product Name	Unit Price	Quant	ity D)iscount	Order Cust Company N	omer lame	Order Employe Last Na	ee me	Order Ship Via Company Name	Product Category Name	Product Supplier Company Name	Extended Price
Guaraná Fantástica	\$3.60		15	0.25	Chop-suey Chinese		Buchan	an	United Package	Beverages	Refrescos Americanas LTDA	\$40.5
Pâté chinois	\$19.20		21	0.25	Chop-suey Chinese		Buchan	an	United Package	Meat/Poultry	Ma Maison	\$302.4
Longlife Tofu	\$8.00		21	0.25	Chop-suey Chinese		Buchan	an	United Package	Produce	Tokyo Traders	\$126.0
	Showing 1-3 of 3 items 🧣											

Creating "Code" Business Rule to Handle the Action

Instead of using SQL, you may also create a code business rule written in C# or Visual Basic to handle the calculation.

If you have implemented the previous SQL business rule, you will need to delete it.

Right-click on Orders / Business Rules / Custom, ApplyDiscount (Sql / Execute) - r100 business rule node and press Delete.



Right-click on Orders / Business Rules node and press New Business Rule.



Assign these values:

Property	Value
Туре	C# / Visual Basic
Command Name	Custom
Command Argument	ApplyDiscount
Phase	Execute

Save the rule. "Code" business rules do not have a script stored in the data controller definition file. A code file must be created in the project. The application generator will create an initial "empty" business rule code file as soon as the project is generated.

On the Project Designer toolbar, press Generate.

When complete, right-click on Orders / Business Rules / Custom, ApplyDiscount (Code / Execute) – r100 node and press Edit Rule in Visual Studio.



The file will be opened in *Visual Studio*. The generator has created a template for the business rule. Replace the existing code with the following:

```
C#:
```

```
using System;
using MyCompany.Data;
namespace MyCompany.Rules
{
    public partial class OrdersBusinessRules : MyCompany.Data.BusinessRules
    {
        /// <summary>
        /// This method will execute in any view for an action
        /// with a command name that matches "Custom" and argument that matches "ApplyDiscount".
        /// </summary>
        [Rule("r100")]
        public void r100Implementation(
                    int? orderID,
                    string customerID,
                    string customerCompanyName,
                    int? employeeID,
                    string employeeLastName,
                    DateTime? orderDate,
                    DateTime? requiredDate,
                    DateTime? shippedDate,
                    int? shipVia,
                    string shipViaCompanyName,
                    decimal? freight,
                    string shipName,
                    string shipAddress,
                    string shipCity,
                    string shipRegion,
                    string shipPostalCode,
```

```
string shipCountry)
        {
            // This is the placeholder for method implementation.
            using (SqlText applyDiscount = new SqlText(
                "update [Order Details] " +
                "set Discount = @Discount " +
                "where OrderID = @OrderID"))
            {
                applyDiscount.AddParameter("@Discount", SelectFieldValue("Parameters_Discount"));
                applyDiscount.AddParameter("@OrderID", orderID);
                applyDiscount.ExecuteNonQuery();
            }
            Result.RefreshChildren();
        }
    }
}
Visual Basic:
Imports MyCompany.Data
Imports System
Imports MyCompany.Rules
Namespace MyCompany.Rules
    Partial Public Class OrdersBusinessRules
        Inherits MyCompany.Data.BusinessRules
        ''' <summary>
        ''' This method will execute in any view for an action
        ''' with a command name that matches "Custom" and argument that matches "ApplyDiscount".
        ''' </summary>
        <Rule("r100")> _
        Public Sub r100Implementation( _
                    ByVal orderID As Nullable(Of Integer), _
                    ByVal customerID As String, _
                    ByVal customerCompanyName As String, _
                    ByVal employeeID As Nullable(Of Integer), _
                    ByVal employeeLastName As String, _
                    ByVal orderDate As Nullable(Of DateTime), _
                    ByVal requiredDate As Nullable(Of DateTime), _
                    ByVal shippedDate As Nullable(Of DateTime), _
                    ByVal shipVia As Nullable(Of Integer), _
                    ByVal shipViaCompanyName As String,
                    ByVal freight As Nullable(Of Decimal), _
                    ByVal shipName As String, _
                    ByVal shipAddress As String, _
                    ByVal shipCity As String, _
                    ByVal shipRegion As String, _
                    ByVal shipPostalCode As String, _
                    ByVal shipCountry As String)
            'This is the placeholder for method implementation.
            Using applyDiscount As SqlText = New SqlText(
                    "update [Order Details] " +
                    "set Discount = @Discount " +
                    "where OrderID = @OrderID"
                    )
                applyDiscount.AddParameter("@Discount", SelectFieldValue("Parameters_Discount"))
                applyDiscount.AddParameter("@OrderID", orderID)
                applyDiscount.ExecuteNonQuery()
```

```
End Using
Result.RefreshChildren()
End Sub
End Class
End Namespace
```

Save the file, and refresh the web page. The *Assign a Discount* action will function in exactly the same way as the version with the SQL business rule.