2010


# USER GUIDE

## Conversion and Validation of User Input

# Conversion and Validation of User Input

*Code On Time* applications offer powerful methods of converting and validating field values entered by users. The unique business rules model allows elegant abstraction of the business logic required to validate and convert user values from the user interface elements responsible for presentation.

## Conversion

Let's consider a simple conversion scenario that requires automatic conversion of a customer contact name to upper case as soon as the user has finished typing. We will use *Northwind* database for this sample.

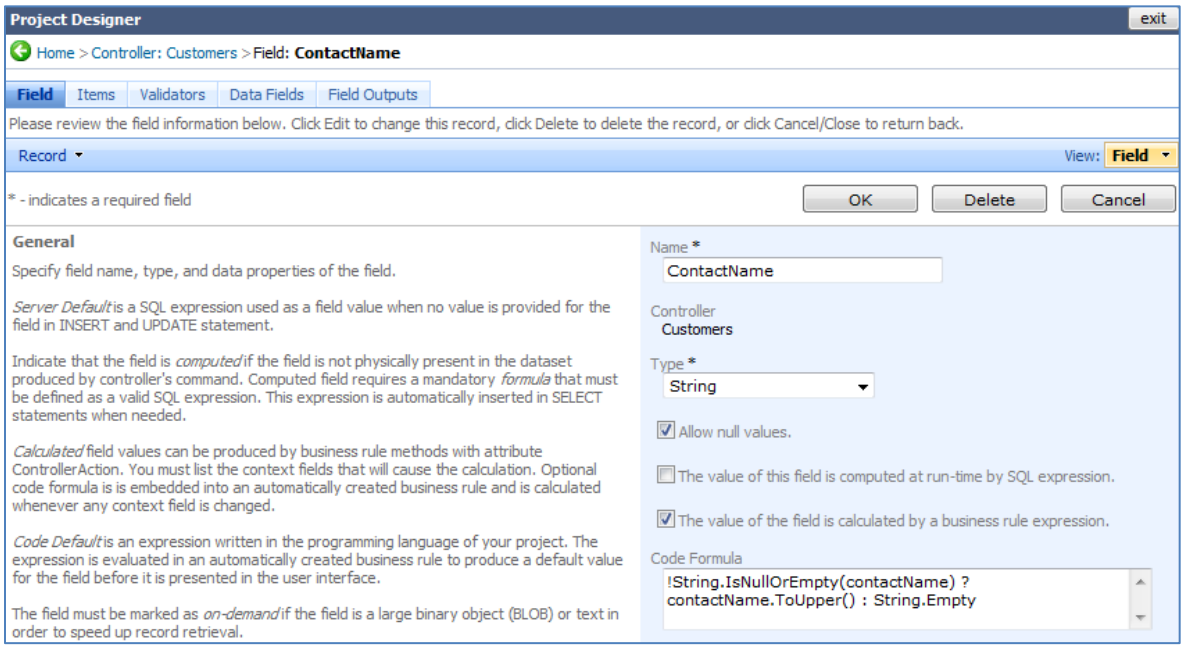
Generate your project, activate the *Designer*, and select *All Controllers* tab. Select *Customers* data controller, switch to *Fields* tab, and select the *ContactName* field. Edit the field, and enable the check box "The value of the field is calculated by a business rule expression".

Enter the following Code Formula if your programming language is C#:

```
!String.IsNullOrEmpty(contactName) ? contactName.ToUpper() : String.Empty
```

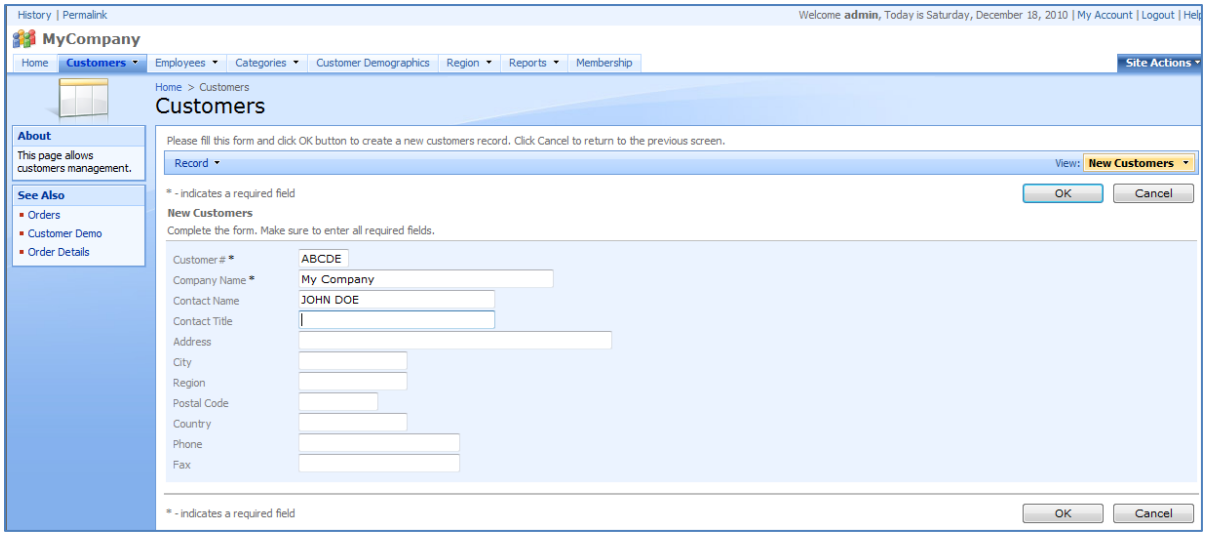
Visual Basic programmers should use the following instead:

```
IIf(Not (String.IsNullOrEmpty(contactName)), contactName.ToUpper(),
String.Empty)
```




Next, scroll down and enter "ContactName" in the *Context Fields* property. This very important step will ensure that the business rules formula is executed as soon as user leaves the field.

Save the field, generate the application, and go to the Customers page. Type in a *Contact Name* and the name will be converted to upper case as soon as you switch to the next field.




This works in all views without any effort on your part. Change the model, and all views will automatically engage the business rules.

Here is the actual file that is automatically produced to implement this calculation. The code is placed in *~/App_Code/Rules/Customers.Generated.cs*:

```
using System;
using System.Data;
using System.Collections.Generic;
using System.Linq;
using System.Text.RegularExpressions;
using System.Web;
using MyCompany.Data;

namespace MyCompany.Rules
{
    public partial class CustomersBusinessRules :
        MyCompany.Data.BusinessRules
    {

        [ControllerAction("Customers", "Calculate", "ContactName")]
        public void CalculateCustomers(string customerID,
            string companyName, string contactName, string contactTitle,
            string address, string city, string region,
            string postalCode, string country, string phone, string fax)
        {
            UpdateFieldValue("ContactName",
                !String.IsNullOrEmpty(contactName) ?
                    contactName.ToUpper() :
                    String.Empty);
        }
    }
}
```

Note that the class is partial. You can implement your own class with the same name and offer a method that performs a more complex conversion using database or other resources required for successful

conversion calculation. Make sure not to change the file directly since the changes will be lost during next code generation. Instead, use *Designer* to change the *Code Formula* of the corresponding field.

Here is the Visual Basic version of the same automatically generated method:

```
Imports MyCompany.Data
Imports System
Imports System.Collections.Generic
Imports System.Data
Imports System.Linq
Imports System.Text.RegularExpressions
Imports System.Web

Namespace MyCompany.Rules

    Partial Public Class CustomersBusinessRules
        Inherits MyCompany.Data.BusinessRules

        <ControllerAction("Customers", "Calculate", "ContactName")> _
        Public Sub CalculateCustomers(ByVal customerID As String, _
                                      ByVal companyName As String, _
                                      ByVal contactName As String, _
                                      ByVal contactTitle As String, _
                                      ByVal address As String, _
                                      ByVal city As String, _
                                      ByVal region As String, _
                                      ByVal postalCode As String, _
                                      ByVal country As String, _
                                      ByVal phone As String, _
                                      ByVal fax As String)
            UpdateFieldValue("ContactName", _
                             IIf(Not (String.IsNullOrEmpty(contactName)), _
                                 contactName.ToUpper(), _
                                 String.Empty))
        End Sub
    End Class
End Namespace
```

## Accessing Field Values

Many scenarios of validation may be narrowed to perform a silent conversion using the method described above. The business rules methods offer every field of the field dictionary of the data controller. You can use the value of any field to perform the conversion.

You can also use methods *SelectFieldValue* and *SelectFieldValueObject* and retrieve a field value required for conversion/validation.

The first method will return the untyped object representing the value of the field or external URL parameter. It is your responsibility to convert the value to use it in a calculation. For example:

```
Convert.ToString(SelectFieldValue("ContactName")).ToUpper()
```

The second method returns only the value objects that correspond to the fields of the data controller. The advantage of using *SelectFieldValueObject* is the ability to access the “Old” and “New” values and the availability of *Modified* property that tells if the field value has changed.

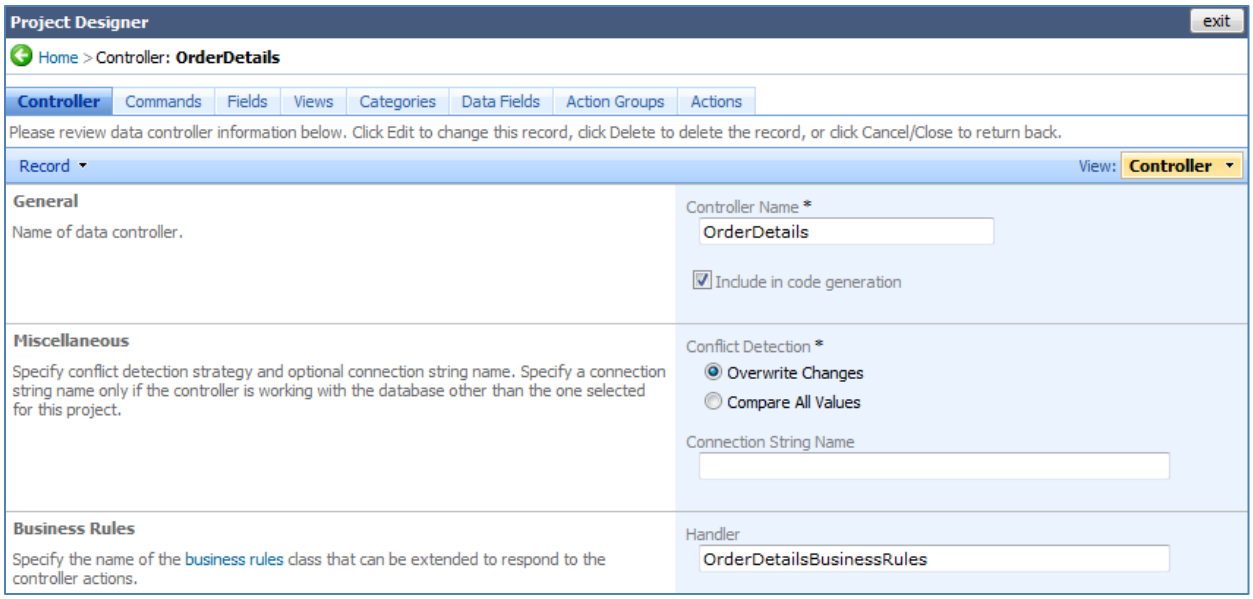
```
Convert.ToString(SelectFieldValueObject("ContactName").NewValue).ToUpper())
```

## Validation

Validation is usually performed just before the standard logic of *Code On Time* application is about to be executed. User has completed input and initiated a command that will result in *INSERT*, *UPDATE*, or *DELETE* statement execution.

Let's consider another example. Let's prevent posting of invalid values to the *Order Details* table.

Select your project on the start page of the code generator, activate the *Designer*. Select the *Order Details* data controller from the list of *All Controllers*, and edit the controller to have "OrderDetailsBusinessRules" as business rules *Handler*.




Save changes, exit the designer, and generate the application.

Open the project in *Visual Studio* using *File | Open Web Site* and double click the *~/App_Code/Rules/OrderDetailsBusinessRules.cs* file to open it in the editor.

Enter the following method if your project language is C#.

```
using System;
using System.Data;
using System.Collections.Generic;
using System.Linq;
using MyCompany.Data;

namespace MyCompany.Rules
{
    public partial class OrderDetailsBusinessRules : MyCompany.Data.BusinessRules
    {
        [ControllerAction("OrderDetails", "Update", ActionPhase.Before)]
        [ControllerAction("OrderDetails", "Insert", ActionPhase.Before)]
        public void ValidateInput(float? discount, short? quanity, decimal? price)
        {
            if (quanity.HasValue && quanity > 10)
                if (!Controller.UserIsInRole("Administrators"))
                    throw new Exception("You are not authorized to sell more than 10 items.");
            if (discount.HasValue && discount.Value > 0.15)
                throw new Exception("The discount cannot be more than 15%.");
            if (!price.HasValue || price.Value == 0.0m)
            {
                Result.Focus("UnitPrice", "The price must be greater than zero.");
                throw new Exception("Please validate the entered unit price.");
            }
        }
    }
}
```

Here is the Visual Basic version:

```
Imports MyCompany.Data
Imports System
Imports System.Collections.Generic
Imports System.Data
Imports System.Linq

Namespace MyCompany.Rules

    Partial Public Class OrderDetailsBusinessRules
        Inherits MyCompany.Data.BusinessRules

        <ControllerAction("OrderDetails", "Update", ActionPhase.Before)> _
        <ControllerAction("OrderDetails", "Insert", ActionPhase.Before)> _
        Public Sub ValidateInput(ByVal discount As Nullable(Of Single), _
                                 ByVal quantity As Nullable(Of Short), _
                                 ByVal unitPrice As Nullable(Of Decimal))
            If (quantity.HasValue AndAlso quantity > 10) Then
                If (Not Controller.UserIsInRole("Administrators")) Then
                    Throw New Exception("You are not authorized to sell more then 10 items.")
                End If
            End If
            If (discount.HasValue AndAlso discount.Value > 0.15) Then
                Throw New Exception("The discount cannot be more than 15%.")
            End If
            If (Not (unitPrice.HasValue) Or (unitPrice.HasValue AndAlso unitPrice.Value = 0))
Then
                Result.Focus("UnitPrice", "The price must be greater than zero.")
                Throw New Exception("Please validate the entered unit price.")
            End If

        End Sub

    End Class
End Namespace
```

Notice that the order of the arguments in the validation method is absolutely irrelevant. The same method is handling both *Insert* and *Update* actions. You can implement a dedicated method to handle each situation differently. You can use a *Shared Business Rules* method to create a handler for multiple data controllers.

Run the program, select *Customers | Order Details* page, and try entering the order details records while leaving *Discount*, *Unit Price*, and *Quantity* fields blank. The *Unit Price* validation will detect the problem and will throw an error, as indicated by the message bar at the top. The inline error message, displayed on the next page, explains the problem with more details.