Developer Course

Customization

T250 Inquiry Forms 2022 R2

Revision: 10/27/2022

Acumatica
The Cloud ERP

Contents

Copyright

3933 Lake Washington Blvd NE, # 350, Kirkland, WA 98033

Restricted Rights

The product is provided with restricted rights. Use, duplication, or disclosure by the United States Government is subject to restrictions as set forth in the applicable License and Services Agreement and in subparagraph (c)(1)(ii) of the Rights in Technical Data and Computer Software clause at DFARS 252.227-7013 or subparagraphs (c)(1) and (c)(2) of the Commercial Computer Software-Restricted Rights at 48 CFR 52.227-19, as applicable.

Disclaimer

Acumatica, Inc. makes no representations or warranties with respect to the contents or use of this document, and specifically disclaims any express or implied warranties of merchantability or fitness for any particular purpose. Further, Acumatica, Inc. reserves the right to revise this document and make changes in its content at any time, without obligation to notify any person or entity of such revisions or changes.

Trademarks

Acumatica is a registered trademark of Acumatica, Inc. HubSpot is a registered trademark of HubSpot, Inc. Microsoft Exchange and Microsoft Exchange Server are registered trademarks of Microsoft Corporation. All other product names and services herein are trademarks or service marks of their respective companies.

Software Version: 2022 R2

Last Updated: 10/27/2022

Introduction

The *T250 Inquiry Forms* training course shows how to create inquiry forms by using Acumatica Framework and the customization tools of Acumatica ERP. On an inquiry form, users can view data narrowed by the selection criteria they have specified; these forms are similar to reports but designed for online viewing. While reports are generated in a printable format and have been designed to meaningfully arrange the data, inquiry forms display the data in a table and give the user greater flexibility to dynamically alter selection criteria and configure the table as needed to change the data being viewed.

This course is intended for application developers who are starting to learn how to customize Acumatica ERP.

The course is based on a set of examples that demonstrate the general approach to customizing Acumatica ERP. The course is designed to give you ideas about how to develop your own embedded applications through the customization tools. As you go through the course, you will continue the development of the customization for the cell phone repair shop, which was performed in the previous training courses of the *T* series (which we recommend that you take before completing the current course).

After you complete all the lessons of the course, you will be familiar with the programming techniques that are used to define the Acumatica ERP inquiry forms.

We recommend that you complete the examples in the order in which they are provided in the course, because some examples use the results of previous ones.

How to Use This Course

To complete this course, you will complete the lessons from each part of the course in the order in which they are presented and then pass the assessment test. More specifically, you will do the following:

1. Complete *Course Prerequisites*, perform *Initial Configuration*, and carefully read *Company Story and Customization Description*.
2. Complete the lessons in all parts of the training guide.
3. In Partner University, take *T250 Certification Test: Inquiry Forms*.

After you pass the certification test, you will receive the Partner University certificate of course completion.

What Is in a Part

The first part of the course explains how to create an inquiry form with different kinds of filtering.

The second part of the course explains how to display information from different DACs on a single tab by using the `PXProjection` attribute.

Each part of the course consists of lessons you should complete.

What Is in a Lesson

Each lesson is dedicated to a particular development scenario that you can implement by using Acumatica ERP customization tools and Acumatica Framework. Each lesson consists of a brief description of the scenario and an example of the implementation of this scenario.

The lesson may also include *Additional Information* topics, which are outside of the scope of this course but may be useful to some readers.

Each lesson ends with a *Lesson Summary* topic, which summarizes the development techniques used during the implementation of the scenario.

What the Documentation Resources Are

The complete Acumatica ERP and Acumatica Framework documentation is available at *https://help.acumatica.com/* and is included in the Acumatica ERP instance. While viewing any form used in the course, you can click the **Open Help** button in the top pane of the Acumatica ERP screen to bring up a form-specific Help menu; you can use the links on this menu to quickly access form-related information and activities and to open a reference topic with detailed descriptions of the form elements.

Which License You Should Use

For the educational purposes of this course, you use Acumatica ERP under the trial license, which does not require activation and provides all available features. For the production use of the Acumatica ERP functionality, an administrator has to activate the license the organization has purchased. Each particular feature may be subject to additional licensing; please consult the Acumatica ERP sales policy for details.

Course Prerequisites

To complete this course, you should be familiar with the basic concepts of Acumatica Framework and Acumatica Customization Platform. Before you begin this course, we recommend that you complete the following training courses:

- *T200 Maintenance Forms*
- *T210 Customized Forms and Master-Detail Relationship*
- *T220 Data Entry and Setup Forms*
- *T230 Actions*
- *T240 Processing Forms*

Required Knowledge and Background

To complete the course successfully, you should have the following required knowledge:

- Proficiency with C#, including but not limited to the following features of the language:
  - Class structure
  - OOP (inheritance, interfaces, and polymorphism)
  - Usage and creation of attributes
  - Generics
  - Delegates, anonymous methods, and lambda expressions
- Knowledge of the following main concepts of ASP.NET and web development:
  - Application states
  - The debugging of ASP.NET applications by using Visual Studio
  - The process of attaching to IIS by using Visual Studio debugging tools
  - Client- and server-side development
  - The structure of web forms
- Experience with SQL Server, including doing the following:
  - Writing and debugging complex SQL queries (WHERE clauses, aggregates, and subqueries)
  - Understanding the database structure (primary keys, data types, and denormalization)
- The following experience with IIS:
  - The configuration and deployment of ASP.NET websites
  - The configuration and securing of IIS

Initial Configuration

You need to perform the prerequisite actions described in this part before you start to complete the course.

Step 1: Preparing the Environment

If you have completed any training course of the *T* series and are using the same environment for the current course, you can skip this step.

You should prepare the environment for the training course as follows:

1. Make sure the environment that you are going to use conforms to the *System Requirements for Acumatica ERP 2022 R2*.
2. Make sure that the Web Server (IIS) features that are listed in *Configuring Web Server (IIS) Features* are turned on.
3. Install the Acuminator extension for Visual Studio.
4. Clone or download the customization project and the source code of the extension library from the *Help-and-Training-Examples* repository in Acumatica GitHub to a folder on your computer.
5. Install Acumatica ERP. On the Main Software Configuration page of the installation program, select the **Install Acumatica ERP** and **Install Debugger Tools** check boxes.

   If you have already installed Acumatica ERP without debugger tools, you should remove Acumatica ERP and install it again with the **Install Debugger Tools** check box selected. The reinstallation of Acumatica ERP does not affect existing Acumatica ERP instances. For details, see *To Install the Acumatica ERP Tools*.

Step 2: Preparing the Needed Acumatica ERP Instance for the Training Course

You deploy an Acumatica ERP instance and configure it as follows:

1. Open the Acumatica ERP Configuration Wizard, and do the following:
   a. Click **Deploy New Application Instance for T-series Developer Courses**.
   b. On the **Database Configuration** page, make sure the name of the database is `PhoneRepairShop`.
   c. On the **Instance Configuration** page, do the following:
      a. In the **Local Path of the Instance** box, select a folder that is outside of the `C:\Program Files (x86)`, `C:\Program Files`, and `C:\Users` folders. (We recommend that you store the website folder outside of these folders to avoid an issue with permission to work in these folders when you perform customization of the website.)
      b. In the **Training Course** box, select the training course you are taking.

   The system creates a new Acumatica ERP instance, adds a new tenant, loads the data to it, and publishes the customization project that is needed for this training course.
2. Make sure a Visual Studio solution is available in the `App_Data\Projects\PhoneRepairShop` folder of the Acumatica ERP instance folder. This is the solution of the extension library that you will modify in this course.

3. Sign in to the new tenant by using the following credentials:
   - **Username**: `admin`
   - **Password**: `setup`

   Change the password when the system prompts you to do so.
4. In the top right corner of the Acumatica ERP screen, click the username, and then click **My Profile**. The *User Profile* (SM203010) form opens. On the **General Info** tab, select *YOGIFON* in the **Default Branch** box; then click **Save** on the form toolbar.

   In subsequent sign-ins to this account, you will be signed in to this branch.
5. Optional: Add the *Customization Projects* (SM204505) and *Generic Inquiry* (SM208000) forms to your favorites. For details about how to add a form to your favorites, see *Managing Favorites: General Information*.

To be able to create and pay invoices, configure the instance as follows:

1. On the *Enable/Disable Features* (CS100000) form, enable the *Advanced SO Invoices* feature.
2. On the *Item Classes* (IN201000) form, for the Stock Item class, select the **Allow Negative Quantity** box and click **Save**.
3. On the *Accounts Receivable Preferences* (AR101000) form, clear the **Validate Document Totals on Entry** and **Require Payment Reference on Entry** boxes to simplify the process of releasing an invoice. Click **Save**.

If for some reason you cannot complete instructions in this step, you can create an Acumatica ERP instance as described in *Appendix: Deploying the Needed Acumatica ERP Instance for the Training Course* and manually publish the needed customization project as described in *Appendix: Publishing the Required Customization Project*.

Company Story and Customization Description

In this course, you will continue the development to support the cell phone repair shop of the Smart Fix company; you began and expanded on this development while completing the previous training courses of the *T* series.

> You have loaded and published the customization project with the results of these courses in *Initial Configuration*.

In the previous training courses of the *T* series, you have created the following custom forms:

- The Repair Services (RS201000) maintenance form, which the Smart Fix company uses to manage the lists of repair services that the company provides
- The Serviced Devices (RS202000) maintenance form, which the Smart Fix company uses to manage the lists of devices that can be serviced
- The Services and Prices (RS203000) maintenance form, which provides users with the ability to define and maintain the price for each provided repair service
- The Repair Work Orders (RS301000) data entry form, which is used to create and manage individual work orders for repairs
- The Repair Work Order Preferences (RS101000) setup form, which an administrative user uses to specify the company's preferences for the repair work orders

You have also customized the *Stock Items* (IN202500) form of Acumatica ERP so that users can mark particular stock items as repair items—that is, items that are used for the repair services.

In this course, you will create the Open Payment Summary (RS401000) custom inquiry form. On this form, users will view all repair work orders and sales orders that have not yet been paid in full, along with information about the invoices that have been created for these orders. You will implement the functionality of the form in stages. First, you will implement this form as an inquiry form without filters. Then you will add filtering by using a data view and a data view delegate. You will also learn how to aggregate data in a data view. Finally, you will add redirection links in different columns of the inquiry form.

You will implement a new tab on the Repair Work Orders form that will be shown only if the selected order has been paid in full; this tab will display information about the invoice and the last payment for the repair work order.

Open Payment Summary Form

The following screenshot shows how the Open Payment Summary (RS401000) form will look once you have completed the course.

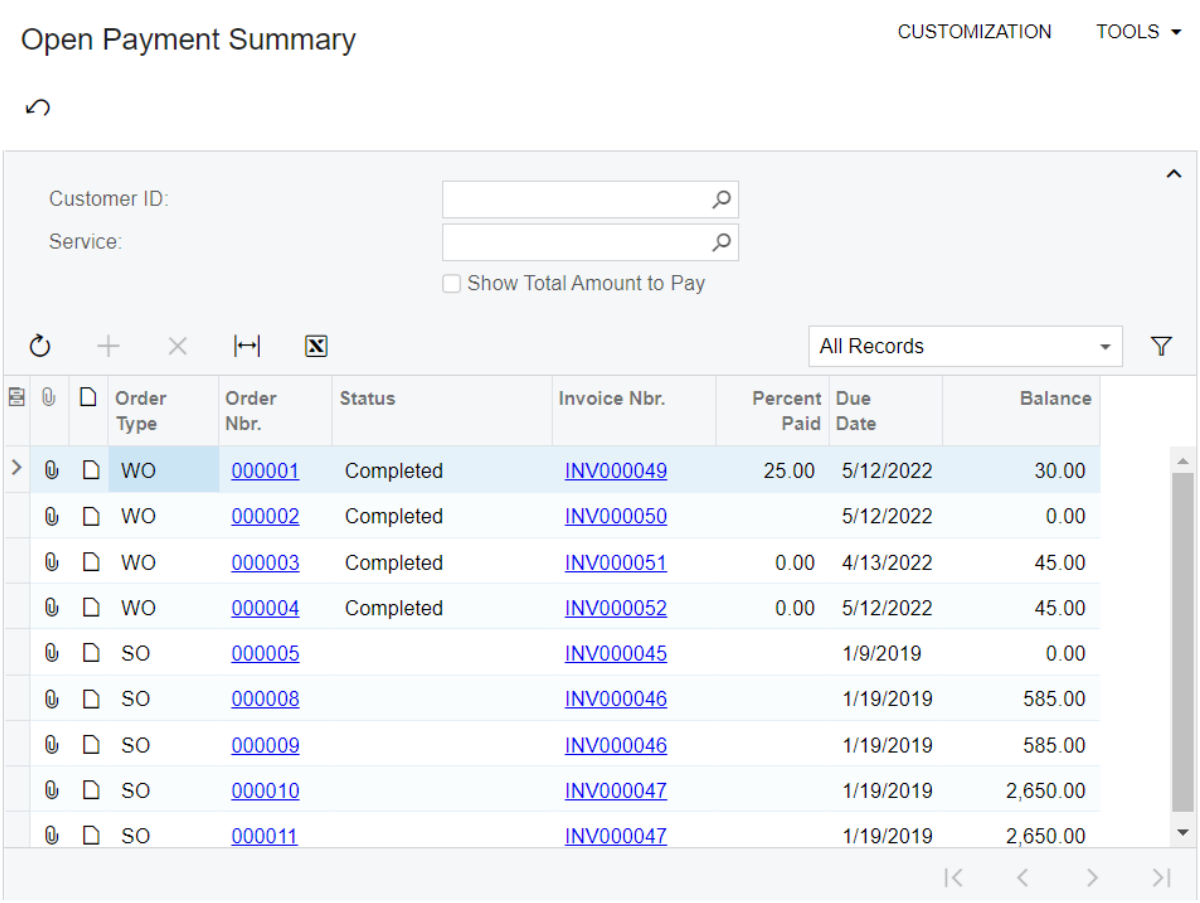


Figure: Open Payment Summary form

The form will contain the following parts:

- The filtering elements in the Selection area, which can be used to filter the list of repair work orders by the customer and service type and to filter the list of sales orders by the customer. Also, the Selection area will contain a check box that indicates whether subtotals for all orders with the same status should be displayed in the **Balance** column along with individual balances.
- The table, which displays the list of repair work orders and sales orders that have not yet been paid in full.

Payment Info Tab

The following screenshot shows how the **Payment Info** tab will look at the end of the course.

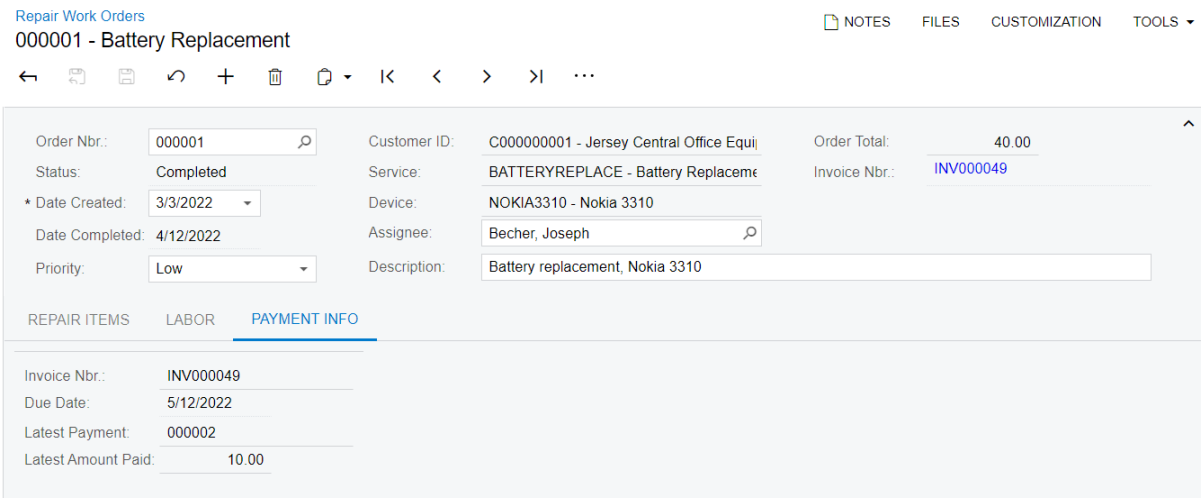


Figure: Payment Info tab

The tab will contain the following elements:

- The **Invoice Nbr.** box, which holds the number of the invoice created for the order
- The **Due Date** box, which contains the due date of the invoice
- The **Latest Payment** box, containing the number of the payment that was the most recent payment applied to the invoice
- The **Latest Amount Paid** box, which contains the amount of the most recently applied payment

Part 1: The Open Payment Summary Form

The Smart Fix company needs to have a custom Acumatica ERP form on which accountants of the company will view payment information for a particular customer: the invoices prepared for repair work orders and sales orders, and the unpaid payments entered for these invoices. For this purpose, in this part of the course, you will create the Open Payment Summary (RS401000) custom inquiry form, which is described in *Company Story and Customization Description*.

On an inquiry form, the user can view data narrowed by the selection criteria they have specified; these forms are similar to reports but designed for the flexible analysis of data online rather than for printing. Typically, an inquiry form consists of a Selection area that provides elements that can be used for data selection (filtering parameters) and a grid that lists the retrieved data; users can dynamically change the selection criteria to change the data in the grid.

Inquiry forms have IDs that start with the two-letter abbreviation (indicating the functional area of the form) followed by *40*, such as *RS401000* for the *repair services (RS)* functional area. The names of the graphs for inquiry forms have the *Inq* suffix. For instance, the `RSSVPaymentPlanInq` graph is used for the Open Payment Summary form.

After you complete the lessons of this part, you will be able to test the functionality of the form.

About Inquiry Forms

Inquiry forms are forms that display data based on the provided filters. An inquiry form usually consists of a Selection area, which consists of UI elements that provide filtering conditions, and a grid that contains the filtered data.

For the Selection area, you define a `PXFilter` data view that provides the filtering (selection) elements displayed on the form. For the grid, you define a data view that retrieves the filtered records. In certain cases, you might need to implement a dynamic query that retrieves specific data depending on the specified filter parameters and query mode. For example, you need to use a dynamic query when you need to display different types of entities or documents in the same grid.

To create an inquiry form in the Screen Editor, you should use the *FormDetail* template. The generated ASPX page will contain the `Content` element for the Selection area and the `Content` element for the grid area.

Sometimes you do not need to have any filters on a form. In these cases, you can skip the defining of the `PXFilter` data view. In the ASPX page, you remove the `Content` element for the Selection area.

Lesson 1.1: Configure the Inquiry Form

In this lesson, you will learn how to create an inquiry form without filtering parameters. To learn about this, you will begin to develop the Open Payment Summary (RS401000) custom inquiry form, which will initially display information about invoices and payments for repair work orders that have been currently not paid in full.

Description of the Form Elements

At the end of this lesson, the inquiry form will include the following parts:

- The table toolbar
- The table with rows for each repair work order and the following columns:
  - **Order Nbr.**: The number of the repair work order
  - **Status**: The status of the repair work order

- **Invoice Nbr.**: The number of the invoice created for the repair work order
- **Due Date**: The due date of this invoice
- **Percent Paid**: The percent of the invoice that has been paid
- **Balance**: The amount that has already been paid for the invoice

Lesson Objectives

In this lesson, you will learn how to create an inquiry form that does not have a filter.

Step 1.1.1: Create the Form—Self-Guided Exercise

In this self-guided exercise, you will create the Open Payment Summary (RS401000) form on your own. Although this is a self-guided exercise, you can use the details and suggestions in this topic as you create the form. The creation of a form is described in detail in the *T200 Maintenance Forms* training course.

If you are using the Customization Project Editor to complete the self-guided exercise, you can follow this instruction:

1. On the toolbar of the Customized Screens page of the Customization Project Editor, click **Create New Screen**.
2. In the **Create New Screen** dialog box which opens, specify the following values:
   - **Screen ID**: `RS.40.10.00`
   - **Graph Name**: `RSSVPaymentPlanInq`
   - **Graph Namespace**: `PhoneRepairShop`
   - **Page Title**: `Open Payment Summary`
   - **Template**: *FormGrid (FormDetail)*
3. Move the generated `RSSVPaymentPlanInq` graph to the extension library.

   - Do not make any standard system actions available.
   - Do not define any data views. You will define the data view in *Step 1.1.3: Define the Inquiry Graph and the Data View*.
4. Make sure the `RSSVWorkOrder` DAC is defined in the `PhoneRepairShop_Code` Visual Studio project. Do not define any new DACs; you will define a new DAC in *Step 1.1.2: Define the DAC for the Grid*.
5. Build the project in Visual Studio.
6. Update the customization project with a new version of the `PhoneRepairShop_Code.dll` and publish the customization project.
7. Add a link to the Open Payment Summary form to the *Inquiries* category of the Phone Repair Shop workspace and make it available in the quick menu.
8. Update the SiteMapNode item for the Open Payment Summary form in the customization project.

Step 1.1.2: Define the DAC for the Grid

The Open Payment Summary (RS401000) form, which you have created in the self-guided exercise, displays information about repair work orders (including the details of the invoice created for each order). All fields on this form are unbound, and you do not need to work with the fields on the Repair Work Orders (RS301000) form, which works with the `RSSVWorkOrder` DAC. Thus, for the grid view of the Open Payment Summary form, you will derive

the new RSSVWorkOrderToPay class from RSSVWorkOrder and extend the new class with additional DAC fields that are specific to the inquiry form.

In the derived DAC, you will add the OrderNbr, InvoiceNbr, and Status abstract classes (which are defined in the base RSSVWorkOrder DAC) with the new modifier. The definition of new abstract classes is required because you will use the data fields of the derived class in BQL statements (such as the BQL statements in the data view of the processing form and in attributes).

If you do not define the abstract classes for the original fields in the derived DAC, these fields will be referred to in the SQL statement that corresponds to the BQL query as the fields of the original DAC. (In this example, the OrderNbr, InvoiceNbr, and Status fields will be referred to as the fields of the RSSVWorkOrder DAC). It may lead to data inconsistency issues when the original and the derived DACs are used in the same BQL statement.

In the derived DAC, you will also add the PercentPaid field. During the retrieval of each of the RSSVWorkOrder records, the value of the PercentPaid field is calculated from the database as the percent of invoice amount which has been paid.

Define a DAC

To define the RSSVWorkOrderToPay DAC, do the following:

1. In the RSSVWorkOrder.cs file, derive the RSSVWorkOrderToPay data access class from RSSVWorkOrder, as shown in the following code.

```
[PXCacheName("Repair Work Order to Pay")]
public class RSSVWorkOrderToPay : RSSVWorkOrder
{
}
```

2. In the RSSVWorkOrderToPay class, define the OrderNbr, InvoiceNbr, and Status abstract classes with the new modifier, as the following code shows.

```
#region InvoiceNbr
public new abstract class invoiceNbr :
    PX.Data.BQL.BqlString.Field<invoiceNbr>
{ }
#endregion

#region Status
public new abstract class status :
    PX.Data.BQL.BqlString.Field<status>
{ }
#endregion

#region OrderNbr
public new abstract class orderNbr :
    PX.Data.BQL.BqlString.Field<orderNbr>
{ }
#endregion
```

3. In the RSSVWorkOrderToPay class, define the PercentPaid field, as the following code shows.

```
#region PercentPaid
[PXDecimal]
[PXUIField(DisplayName = "Percent Paid")]
public virtual Decimal? PercentPaid { get; set; }
public abstract class percentPaid :
```

```
        PX.Data.BQL.BqlDecimal.Field<percentPaid>
    { }
    #endregion
```

4. In the `RSSVPaymentPlanInq` graph, add the calculation of the `PercentPaid` field value in the `FieldSelecting` event. (See the following code.)

```
    protected virtual void _(Events.FieldSelecting<RSSVWorkOrderToPay,
        RSSVWorkOrderToPay.percentPaid> e)
    {
        if (e.Row == null) return;
        if (e.Row.OrderTotal == 0) return;
        RSSVWorkOrderToPay order = e.Row;
        var invoices = SelectFrom<ARInvoice>.
            Where<ARInvoice.refNbr.IsEqual<@P.AsString>>.View.Select(
            this, order.InvoiceNbr);
        if (invoices.Count == 0)
            return;
        ARInvoice first = invoices[0];
        e.ReturnValue = (order.OrderTotal - first.CuryDocBal) /
            order.OrderTotal * 100;
    }
```

   In the event handler, you are selecting the invoice with the same number as the one specified in the repair work order and calculating the percentage.

   You need to use an event handler instead of attributes because checking for zero values cannot be performed by using attributes.

5. Add required `using` directives, which are shown in the following code.

```
using PX.Data.BQL.Fluent;
using PX.Data.BQL;
using PX.Objects.AR;
```

6. Build the project.

Step 1.1.3: Define the Inquiry Graph and the Data View

In this step, you will add the data view to the `RSSVPaymentPlanInq` graph, which works with the Open Payment Summary (RS401000) form. (You added this graph in *Step 1.1.1: Create the Form—Self-Guided Exercise*.)

An inquiry form usually contains two data views: one for the Selection area, and the other for the grid area. In this lesson, you are creating the inquiry form without the Summary area (it will be added in later lessons), so you need to define only one data view for the grid area.

In the data view that provides data for a grid, you should select only those repair work orders that are not yet paid and the invoices for these orders. Also, you enable reusable filters on the grid by adding the `PXFilterable` attribute to the data view that provides data for a grid. The attribute enables the **Filter Settings** dialog box for the grid, in which the user can define and save custom filters and then use them every time this user opens the form. Reusable filters are frequently enabled in the grid on inquiry and processing forms, so that users can customize these forms to show specific data that is most relevant to their needs and responsibilities. For more information on reusable filters, see *Saving of Filters for Future Use* and *To Filter the Data in a Table*.

To Define the Data View

1. In the RSSVPaymentPlanInq.cs file, add the following using directive.

```
using PhoneRepairShop.Workflows;
```

2. In the RSSVPaymentPlanInq graph, add the following member. (Replace the automatically generated DetailsView member if you have used the Customization Project Editor to create the graph.)

```
        [PXFilterable]
        public SelectFrom<RSSVWorkOrderToPay>.
            InnerJoin<ARInvoice>.On<ARInvoice.refNbr.
                IsEqual<RSSVWorkOrderToPay.invoiceNbr>>.
            Where<RSSVWorkOrderToPay.status.
                IsNotEqual<RSSVWorkOrderWorkflow.States.paid>>.
            View.ReadOnly DetailsView;
```

   The InnerJoin clause adds information from the invoice that was created for the repair work order so that you can display the due date and balance of the invoice on the page.

   The Where clause excludes from the results of the query all orders with the *Paid* status.

   Because users don't need to edit any records on the inquiry form, you use the ReadOnly view type, which defines the selection of records in read-only mode. In the UI, Acumatica Framework automatically disables the editing of data records that were retrieved through a read-only data view.

3. Build the project.

Step 1.1.4: Configure the ASPX page

In this step, you will define a grid on the Open Payment Summary (RS401000) form. In the grid, you will add fields from the RSSVWorkOrderToPay and ARInvoice DACs selected in the DetailsView view. Do the following:

1. In the RS401000.aspx file, for the px:PXDataSource control, specify the value of the PrimaryView property as *DetailsView*.
2. If you have generated the ASPX code of the page based on the *FormDetail* template by using the Screen Editor, remove the Content element that contains the PXFormView control.
3. Define the columns for the grid as shown in the following code.

```
    <px:PXGridLevel DataMember="DetailsView">
        <Columns>
            <px:PXGridColumn DataField="OrderNbr" Width="72" />
            <px:PXGridColumn DataField="Status" Width="140" />
            <px:PXGridColumn DataField="InvoiceNbr" Width="72" />
            <px:PXGridColumn DataField="PercentPaid" Width="72" />
            <px:PXGridColumn DataField="ARInvoice__DueDate" Width="72" />
            <px:PXGridColumn DataField="ARInvoice__CuryDocBal" Width="100" />
        </Columns>
    </px:PXGridLevel>
```

   Note that to add fields that have not been defined in the RSSVWorkOrderToPay DAC, but have been defined in the ARInvoice DAC, which has been specified in the view, you use the following structure: <DAC_name>__<Field_name>.

> You can perform the steps above by modifying the `RS401000.aspx` file located in the `Pages/RS` folder of the instance or by modifying the `RS401000.aspx` file in the Files section of the Customization Project Editor.

4. Publish the customization project.

Step 1.1.5: Test the Open Payment Summary Form

In this step, you will test the Open Payment Summary (RS401000) inquiry form.

Before You Proceed

To be able to test the inquiry page you are developing, the database should contain invoices and payments to be displayed. To add these invoices and payments, do the following:

1. On the Repair Work Orders (RS301000) form, remove hold from, assign, complete, and create invoices for all existing repair work orders.
2. For the *000001* work order, do the following:
   a. Open an invoice for the *000001* work order by clicking the link in the **Invoice Nbr.** box.
   b. On the *Invoices* (SO303000) form, click **Remove Hold**, **Release**, and then **Pay**. The *Payments and Applications* (AR302000) form opens.
   c. On the **Documents to Apply** tab of the *Payments and Applications* form, in the **Amount Paid** column, type `10`.
   d. On the form toolbar, click **Remove Hold** and then **Release**.
3. For the *000003* work order, do the following:
   a. Open an invoice for the *000003* work order by clicking the link in the **Invoice Nbr.** box.
   b. On the *Invoices* form, change the **Due Date** box value to the tomorrow's date and save your changes.

Testing of the Form

To test the Open Payment Summary (RS401000) inquiry form, do the following:

1. In Acumatica ERP, open the Open Payment Summary form.

   The form should look as shown in the following screenshot. Note that the table area has a toolbar with standard actions and the **Filter Settings** button.

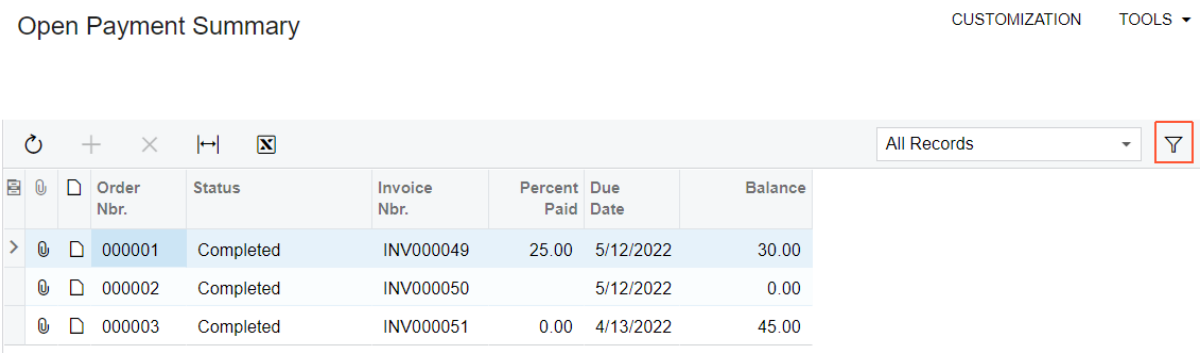


Figure: The basic Open Payment Summary form

2. Change the current business date to the day after tomorrow. For details about how to change the business date, see *To Change the Business Date*.
3. On the table toolbar, click the **Filter Settings** button.
4. In the **Filter Settings** dialog box, which opens, add a filter with the following settings:
   - **Property**: *Due Date*
   - **Condition**: *Is Less Than*
   - **Value**: *@Today*
5. Click **Apply**.

   The form displays overdue payments. An example is shown in the following screenshot.

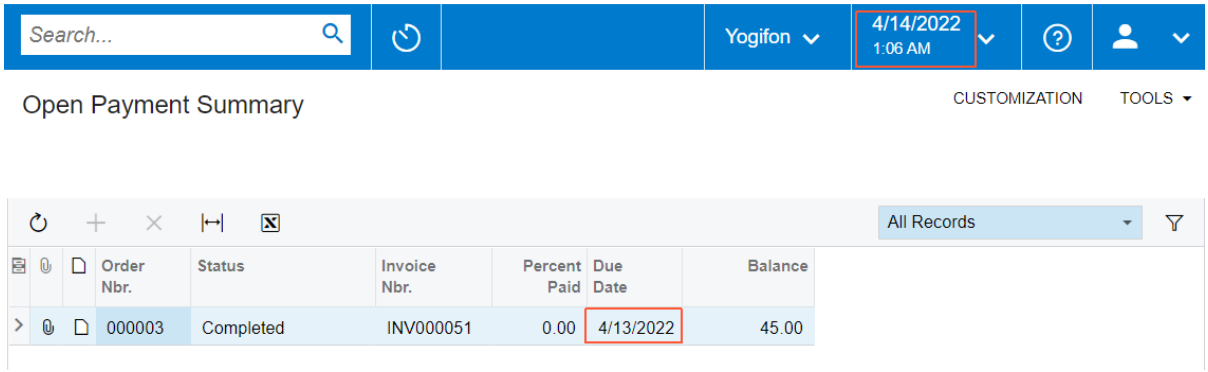


Figure: The Open Payment Summary form with overdue payments

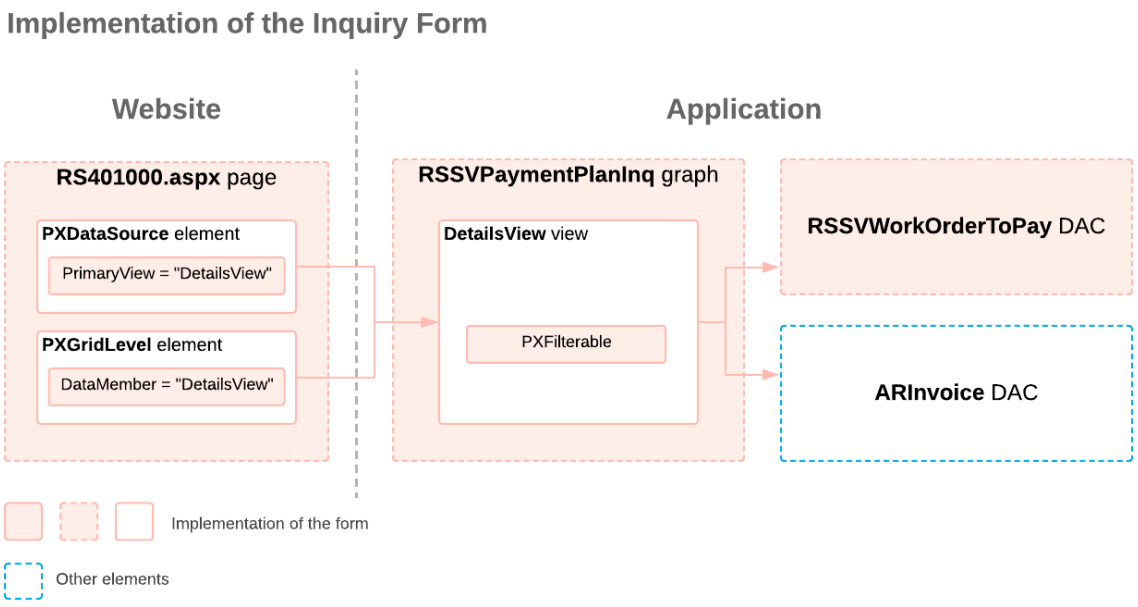
6. To clear the filter, open the **Filter Settings** dialog box, clear the unnamed check box for the filter you created, and click **Apply**.
7. Change the business date to the current date value.

Lesson Summary

In this lesson, you have learned how to create a simple inquiry form that displays data and provides standard filtering. You have defined the following components of the inquiry form:

- The DAC, with unbound fields that are displayed in the grid
- The inquiry graph, in which you have defined a data view for the grid with the `PXFilterable` attribute
- The ASPX page, in which you have defined columns for the grid

The following diagram shows the components that you have implemented or modified for the inquiry form.



Lesson 1.2: Configure a Filter for the Inquiry Form

In this lesson, you will modify the Open Payment Summary (RS401000) inquiry form you have developed so that it has filtering parameters. By using the UI elements associated with the filtering parameters, a user can filter the repair work orders listed in the table on the form.

Lesson Objectives

In this lesson, you will learn how to do the following:

- Define a `PXFilter` data view
- Display the UI elements associated with the filter parameters in the page URL

Step 1.2.1: Define the DAC for Filter Parameters

In this step, you will define the `RSSVWorkOrderToPayFilter` DAC, which will be used to display the selection criteria (filtering parameters) on the Open Payment Summary (RS401000) form. The DAC will contain two fields (`CustomerID` and `ServiceID`) that correspond to the filtering parameters. The DAC will contain only unbound fields because you do not read the values of the parameters from the database.

To define the filter DAC, do the following:

1. In the `RSSVPaymentPlanInq` graph, define the `RSSVWorkOrderToPayFilter` data access class as follows.

```
[PXHidden]
public class RSSVWorkOrderToPayFilter : IBqlTable
{
    #region ServiceID
    [PXInt()]
    [PXUIField(DisplayName = "Service")]
```

```
        [PXSelector(
            typeof(Search<RSSVRepairService.serviceID>),
            typeof(RSSVRepairService.serviceCD),
            typeof(RSSVRepairService.description),
            DescriptionField = typeof(RSSVRepairService.description),
            SelectorMode = PXSelectorMode.DisplayModeText)]
        public virtual int? ServiceID { get; set; }
        public abstract class serviceID :
            PX.Data.BQL.BqlInt.Field<serviceID>
        { }
        #endregion

        #region CustomerID
        [CustomerActive(DisplayName = "Customer ID")]
        public virtual int? CustomerID { get; set; }
        public abstract class customerID :
            PX.Data.BQL.BqlInt.Field<customerID>
        { }
        #endregion
    }
```

2. For the filtering parameters to be used in a BQL query, add the `serviceID` and `customerID` fields to the `RSSVWorkOrderToPay` DAC as follows.

```
        public new abstract class serviceID :
            PX.Data.BQL.BqlInt.Field<serviceID>
        { }

        public new abstract class customerID :
            PX.Data.BQL.BqlInt.Field<customerID>
        { }
```

> If you have generated the `RSSVPaymentPlanInq` by using the Screen Editor, in this step, you can also remove the `MasterView` data view because `RS401000.aspx` file has no more references to the `MasterView` data view. You have removed them with the `Content` element in *Step 1.1.4: Configure the ASPX page*. You can also remove the `Save` and `Cancel` actions that were generated automatically.

3. Build the project.

Step 1.2.2: Configure the Graph

In this step, you will prepare the graph members that are used for filtering data on the form. You can define filtering for inquiry forms in the same way as you did for processing forms in the *T240 Processing Forms* training course. You will define the following members:

- The `Cancel` action, which clears the selected filter values.
- The `PXFilter` data view that provides filtering parameters for the processing form.

  For more information on defining filters, see *Data View for the Filtering Parameters*.
- Override the `IsDirty` property of the graph to make the `IsDirty` property always return *false*. This disables the dialog box that confirms that a user wants to leave the form.

In the `RSSVPaymentPlanInq` graph, do the following:

1. Define a `PXFilter` data view (as shown below), which provides filtering parameters for the inquiry form.

```
public PXFilter<RSSVWorkOrderToPayFilter> Filter;
```

2. Define the `Cancel` action, which adds the **Cancel** button to the form toolbar, as shown in the following code. The button clears the filter.

```
public PXCancel<RSSVWorkOrderToPayFilter> Cancel;
```

3. Replace the definition of the `DetailsView` data view with the following code, which not only selects repair work orders that do not have the *Paid* status but also matches the filtering criteria.

```
[PXFilterable]
public SelectFrom<RSSVWorkOrderToPay>.
    InnerJoin<ARInvoice>.On<ARInvoice.refNbr.IsEqual<
        RSSVWorkOrderToPay.invoiceNbr>>.
    Where<RSSVWorkOrderToPay.status.IsNotEqual<
        RSSVWorkOrderWorkflow.States.paid>.
        And<RSSVWorkOrderToPayFilter.customerID.FromCurrent.IsNull.
            Or<RSSVWorkOrderToPay.customerID.IsEqual<
                RSSVWorkOrderToPayFilter.customerID.FromCurrent>>>.
        And<RSSVWorkOrderToPayFilter.serviceID.FromCurrent.IsNull.
            Or<RSSVWorkOrderToPay.serviceID.IsEqual<
                RSSVWorkOrderToPayFilter.serviceID.FromCurrent>>>>.
    View.ReadOnly DetailsView;
```

4. Override the `IsDirty` property of the graph, as the following code shows.

```
public override bool IsDirty
{
    get
    {
        return false;
    }
}
```

5. Build the project.

Related Links

- *Data View for the Filtering Parameters*

Step 1.2.3: Adjust the ASPX Page

In this step, you will add to the `RS401000.aspx` page the Selection area with elements to be used for filtering.

Do the following:

1. Open the `RS401000.aspx` file.
2. Specify the `Filter` data view you defined in *Step 1.2.2: Configure the Graph* in the `PrimaryView` property of the datasource control, as shown in the following code.

```
<px:PXDataSource ID="ds" runat="server" Visible="True" Width="100%"
      TypeName="PhoneRepairShop.RSSVPaymentPlanInq"
      PrimaryView="Filter"
      >
```

3. Add the following code to define the Selection area of the form with filters.

You can do the same in the Screen Editor without entering the code manually.

```
<asp:Content ID="cont2" ContentPlaceHolderID="phF" Runat="Server">
  <px:PXFormView runat="server" ID="CstFormView1" DataSourceID="ds"
      DataMember="Filter" Width="100%" >
    <Template>
      <px:PXLayoutRule LabelsWidth="XM" runat="server" ID="CstPXLayoutRule3"
        StartColumn="True" ></px:PXLayoutRule>
      <px:PXSegmentMask CommitChanges="True" runat="server" ID="CstPXSegmentMask1"
        DataField="CustomerID" ></px:PXSegmentMask>
      <px:PXSelector CommitChanges="True" runat="server" ID="CstPXSelector2"
        DataField="ServiceID" ></px:PXSelector>
    </Template>
  </px:PXFormView>
</asp:Content>
```

The Selection area is defined by the `PXFormView` container control. For the `DataMember` property of the `PXFormView` control, you specify the *Filter* view. Inside the `PXFormView` control, you add a `PXSegmentMask` control to select a customer, and a `PXSelector` object to select a service.

4. Save your changes.

Step 1.2.4: Display the Filter Values in the URL

When a form contains filtering parameters, it is sometimes useful to have the selected parameter values in the form URL so that the same form (that is, the form with the same selections made) can be opened elsewhere without the filter parameter values being entered again. For example, when the filter parameters are specified in the form URL, a user can easily share the inquiry results with another user by just sharing a link to the form without specifying which values need to be selected.

To display filtering parameters in the form URL, you need to configure the `PageLoadBehavior` attribute in the form ASPX file.

In this step, you will configure the `RS401000.aspx` file to display filter parameter values in the form URL.

Do the following:

1. In the `RS401000.aspx` file, find the `PXDataSource` control.
2. Add the `PageLoadBehavior` attribute value to the `PXDataSource` control, as the following code shows.

```
  <px:PXDataSource ID="ds" runat="server" Visible="True" Width="100%"
        TypeName="PhoneRepairShop.RSSVPaymentPlanInq"
        PageLoadBehavior="PopulateSavedValues"
        PrimaryView="Filter"
        >
```

The system puts in the URL the filter values of the primary view only (in this case, the values of the `PXFilter<RSSVWorkOrderToPayFilter> Filter` view).

3. Publish the customization project.

Step 1.2.5: Test the Filtering Parameters

In this step, you will test the Open Payment Summary (RS401000) inquiry form with the filtering parameters.

Do the following:

1. In Acumatica ERP, open the Open Payment Summary form.

   The form should look as shown in the following screenshot. Note that the form contains a form toolbar, the Selection area with UI elements that correspond to the filtering parameters, and a table area with a toolbar.

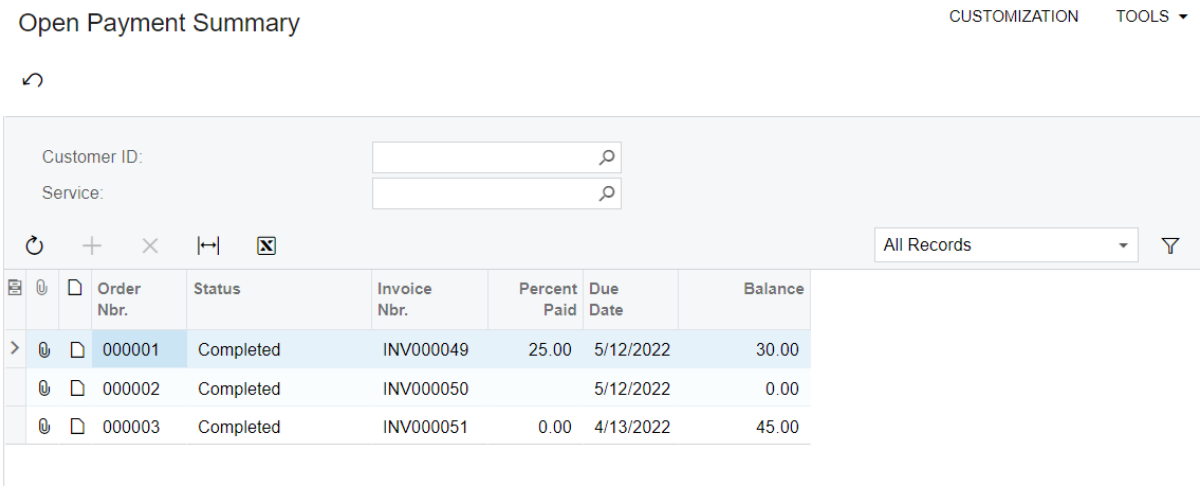


   Figure: The revised Open Payment Summary form

2. On the Repair Work Orders (RS301000) form, do the following:
   a. Create a repair work order with the following values:
      - **Customer ID**: *C000000003*
      - **Service**: *Battery Replacement*
      - **Device**: *Nokia 3310*
      - **Description**: `Battery replacement, Nokia 3310`
   b. On the form toolbar, click **Remove Hold**, **Assign**, **Complete**, and **Create Invoice**.
3. On the Open Payment Summary form, in the **Customer ID** box, select the *C000000001* customer.

   The table displays work orders for the *C000000001* customer. Note that the page URL includes the form ID and customer ID values as shown below.

```
http://localhost/PhoneRepairShop/Main?ScreenId=RS401000&CustomerID=C000000001
```

4. In the **Service ID** box, select the *Battery Replacement* service.

   The table displays the work orders for the *C000000001* customer and the *Battery Replacement* service. Note that the page URL contains the form ID, customer ID, and service ID values as shown below.

```
http://localhost/PhoneRepairShop/Main?
ScreenId=RS401000&ServiceID=1&CustomerID=C000000001
```

5. On the form toolbar, click **Cancel**.

   Notice that the boxes in the Selection area are cleared and that the URL no longer includes the filter values.

Lesson Summary

In this lesson, you have learned how to define an inquiry form with a filter. To add a filter to the inquiry form, you have performed the following actions:

1. Defined the DAC that provides the filtering parameters for the inquiry form
2. In the graph, defined the following:
   - The `Cancel` action
   - The `PXFilter` data view that provides data for the filter
3. In the ASPX page, added the `PXFormView` container with the elements that correspond to the filtering parameters

Also, you have learned how to display the selected filter values (that is, the selection criteria) in the form URL by configuring the `PageLoadBehavior` attribute in the ASPX page.

The following diagram shows the components that you have implemented or modified in this lesson.

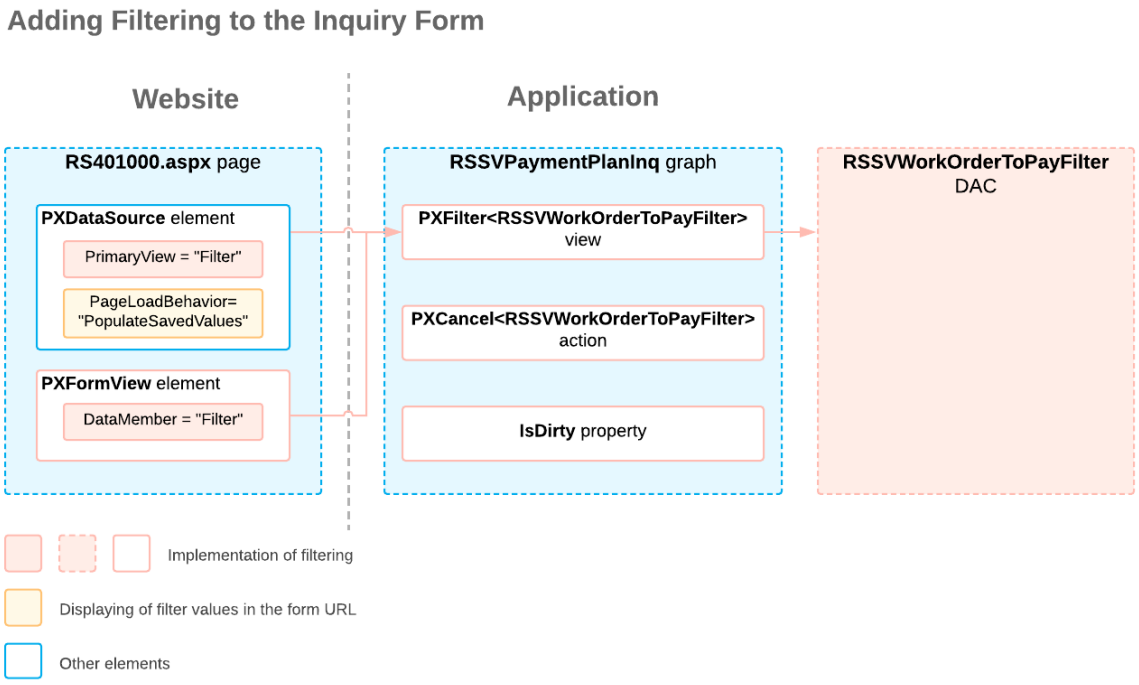


Figure: Adding filtering to the inquiry form

Lesson 1.3: Dynamically Add Filtering Conditions

The Smart Fix company can both repair mobile phones and sell parts for repairing a mobile phone. Users create repair work orders to record each repair process. They also create sales orders to record each sale of parts associated with a repair. Employees of the Smart Fix company need to review information on both repair work orders and sales orders, including details of the invoices created for these orders.

Thus, in this lesson, you will modify the Open Payment Summary (RS401000) form so that it displays sales orders as well as repair work orders.

You cannot implement the displaying of two different types of entities on a single form by using a single BQL query of a data view. So you will compose a query for the form dynamically in code rather than specify the query in the definition of a data view. When you use this approach, you can build a custom data set that replaces the data set that the data view selects by executing a BQL statement. You add the query dynamically in code by defining the data view delegate.

Lesson Objectives

In this lesson, you will learn how to define a data view delegate.

Step 1.3.1: Add the New Field

To distinguish between sales orders and repair work orders that are listed on the Open Payment Summary (RS401000) form, you need to add a new column to the grid. This column will contain the identifier of the order type: *SO* if the order in the row is a sales order, and *WO* if the order in the row is a repair work order.

Do the following:

1. In the `Constants.cs` file, add the class.

```
public static class OrderTypeConstants
{
    public const string SalesOrder = "SO";
    public const string WorkOrder = "WO";
}
```

2. In the `Messages.cs` file, add the following strings to the `Messages` class.

```
    // Order types
    public const string SalesOrder = "SO";
    public const string WorkOrder = "WO";
```

3. Add the following field to the `RSSVWorkOrderToPay` DAC.

```
    #region OrderType
    [PXString(IsKey = true)]
    [PXUIField(DisplayName = "Order Type")]
    [PXUnboundDefault(OrderTypeConstants.WorkOrder)]
    [PXStringList(
      new string[]
      {
          OrderTypeConstants.SalesOrder,
          OrderTypeConstants.WorkOrder
      },
      new string[]
      {
          Messages.SalesOrder,
          Messages.WorkOrder
      })]
    public virtual String OrderType { get; set; }
    public abstract class orderType :
        PX.Data.BQL.BqlDecimal.Field<orderType>
    { }
```

```
        #endregion
```

4. Build the project.
5. In the `RS401000.aspx` file, add the following column before the `OrderNbr` column.

```
            <px:PXGridColumn DataField="OrderType" Width="70" />
```

6. Publish the customization project.

Step 1.3.2: Define the Data View Delegate

To display both sales orders and repair work orders in one grid, you need to define a data view delegate in which you use two separate queries: a query to select sales orders and a query to select repair work orders. After you select each query, you return the result with the `yield` key word, which allows you to return each record without exiting the method. Thus, you don't need to create a temporary collection with the results of the query.

About Data View Delegates

By default, when a data view object is requested by the UI or you invoke the `Select()` method on the object, the system executes the query specified in the data view declaration. However, you can define a dynamic query, which is an optional graph method (called the *data view delegate*) that is executed when the data view is requested. If no dynamic query is defined in the graph, Acumatica Framework executes the BQL statement from the data view declaration.

We recommend that you use data view delegates in the following cases:

- If the query retrieves data fields that cannot be calculated declaratively by attributes—for instance, if you are retrieving values aggregated by calculated data fields
- If the result set has data records that aren't retrieved from the database and are composed dynamically in code

To define the delegate for a data view, you should redeclare the data view and add a method that has the same name as the data view, except with a different case for the first letter (for example, if the data view name is *MyDataView*, the name of the delegate must be *myDataView*).

For details on data view delegates, see *Data View Delegates* and *To Add a Data View Delegate* .

Defining the Data View Delegate

To define the needed data view delegate, do the following:

1. To compose a query that selects sales orders and invoices created for these sales orders, learn the names of the DACs you will use in the query.

   In Acumatica ERP, an invoice cannot be created directly for a sales order. A user first creates a shipment and then creates an invoice for the shipment. The invoice number is stored in the SO shipment record. Therefore, you need to use the DAC that contains information about SO shipments. To learn the DAC name, do the following:

   a. In Acumatica ERP, open the *Sales Orders* (SO301000) form.

   b. Open the **Shipments** tab, which contains information about shipments and the corresponding invoices.

   c. While pressing Ctrl + Alt, click the **Invoice Nbr.** column.

      In the **Element Properties** dialog box, which opens, note that the DAC name is `SOOrderShipment` and that the **Invoice Nbr.** column field name is `InvoiceNbr`.

2. Open the source code of the `SOOrderShipment` DAC and investigate its fields. You can see that the DAC contains both the sales order number (in the `OrderNbr` field) and the invoice number (in the `InvoiceNbr` field). You will use this information later to construct a fluent BQL statement.
3. In the `RSSVPaymentPlanInq` graph, define a method that converts an object of the `SOOrderShipment` DAC to an object of the `RSSVWorkOrderToPay` DAC.

```
public static RSSVWorkOrderToPay RSSVWorkOrderToPay
    (SOOrderShipment shipment)
{
    RSSVWorkOrderToPay ret = new RSSVWorkOrderToPay();
    ret.OrderNbr = shipment.OrderNbr;
    ret.InvoiceNbr = shipment.InvoiceNbr;
    return ret;
}
```

4. Add the following delegate method. The method has the same name as the data view except that it uses a different case for the first letter.

```
protected virtual IEnumerable detailsView()
{
    foreach (PXResult<RSSVWorkOrderToPay, ARInvoice> order in
        SelectFrom<RSSVWorkOrderToPay>.InnerJoin<ARInvoice>.
        On<ARInvoice.refNbr.IsEqual<RSSVWorkOrderToPay.invoiceNbr>>.
        Where<RSSVWorkOrderToPay.status.IsNotEqual<
            RSSVWorkOrderWorkflow.States.paid>.
        And<RSSVWorkOrderToPayFilter.customerID.FromCurrent.IsNull.
        Or<RSSVWorkOrderToPay.customerID.IsEqual<
            RSSVWorkOrderToPayFilter.customerID.FromCurrent>>>.
            And<RSSVWorkOrderToPayFilter.serviceID.FromCurrent.IsNull.
            Or<RSSVWorkOrderToPay.serviceID.IsEqual<
                RSSVWorkOrderToPayFilter.serviceID.FromCurrent>>>>.
                View.Select(this))
    {
        yield return order;
    }

    var sorders = SelectFrom<SOOrderShipment>.InnerJoin<ARInvoice>.
        On<ARInvoice.refNbr.IsEqual<SOOrderShipment.invoiceNbr>>.
        Where<RSSVWorkOrderToPayFilter.customerID.FromCurrent.IsNull.
        Or<SOOrderShipment.customerID.IsEqual<
            RSSVWorkOrderToPayFilter.customerID.FromCurrent>>>.
            View.Select(this);
    foreach (PXResult<SOOrderShipment, ARInvoice> order in sorders)
    {
        SOOrderShipment soshipment = order;
        ARInvoice invoice = order;
        RSSVWorkOrderToPay workOrder = RSSVWorkOrderToPay(soshipment);
        workOrder.OrderType = OrderTypeConstants.SalesOrder;
        var result = new PXResult<RSSVWorkOrderToPay, ARInvoice>(
            workOrder, invoice);
        yield return result;
    }
}
```

In the code above, first you select repair work orders according to the filter values and return each repair work order. Then you select information about sales orders from SO shipments according

to the filter values; for each object of the result list order, you convert the object to the set of the `RSSVWorkOrderToPay` and `ARInvoice` objects, and return the result.

5. Add required `using` directives, which are shown in the following code.

```
using PX.Objects.SO;
using System.Collections;
```

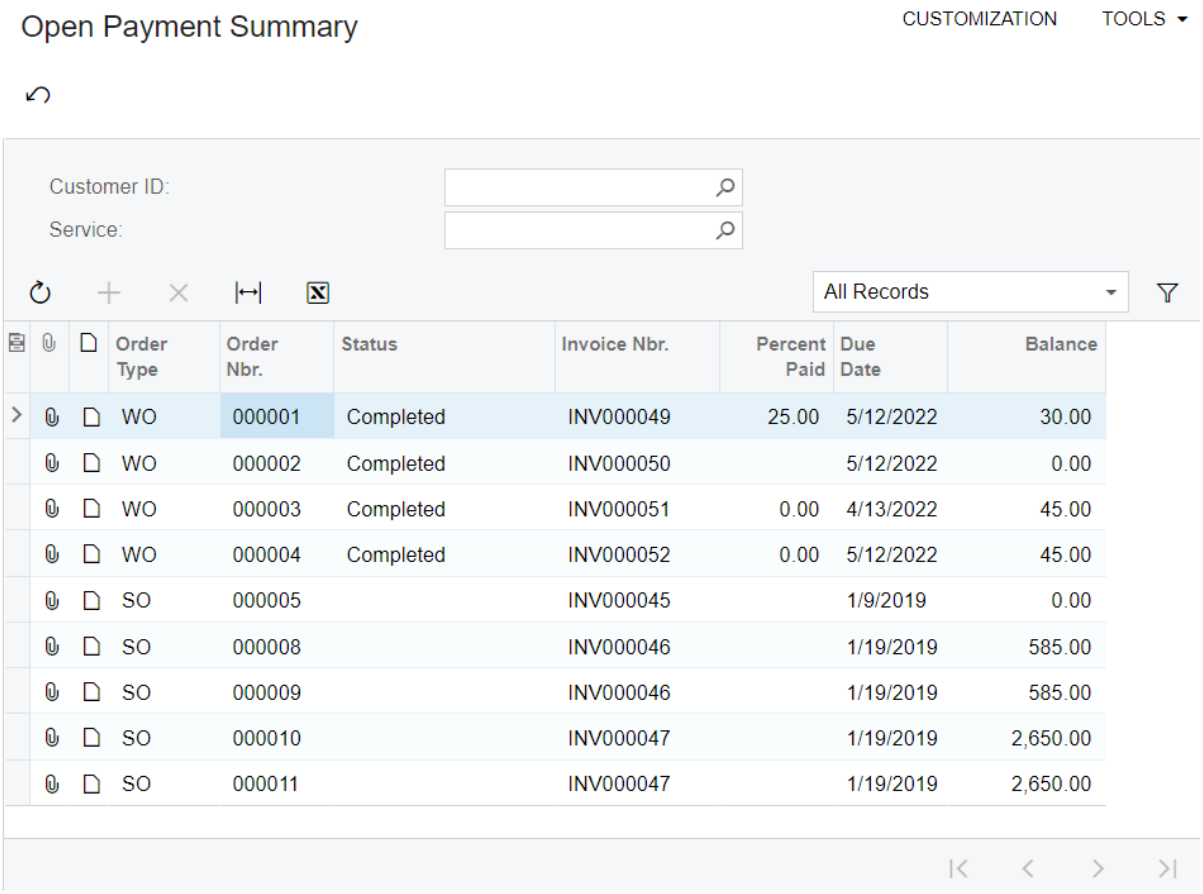
6. Build the project.

Step 1.3.3: Test the Results

To test the updated Open Payment Summary (RS401000), do the following:

1. In Acumatica ERP, open the Open Payment Summary form.

   The form should list both repair work orders and sales orders, as shown in the following screenshot.



Order Type	Order Nbr.	Status	Invoice Nbr.	Percent Paid	Due Date	Balance
WO	000001	Completed	INV000049	25.00	5/12/2022	30.00
WO	000002	Completed	INV000050		5/12/2022	0.00
WO	000003	Completed	INV000051	0.00	4/13/2022	45.00
WO	000004	Completed	INV000052	0.00	5/12/2022	45.00
SO	000005		INV000045		1/9/2019	0.00
SO	000008		INV000046		1/19/2019	585.00
SO	000009		INV000046		1/19/2019	585.00
SO	000010		INV000047		1/19/2019	2,650.00
SO	000011		INV000047		1/19/2019	2,650.00

Figure: The form with repair work orders and sales orders

2. In the **Customer ID** box, select the *C000000003* customer.

   The results should look as shown below.

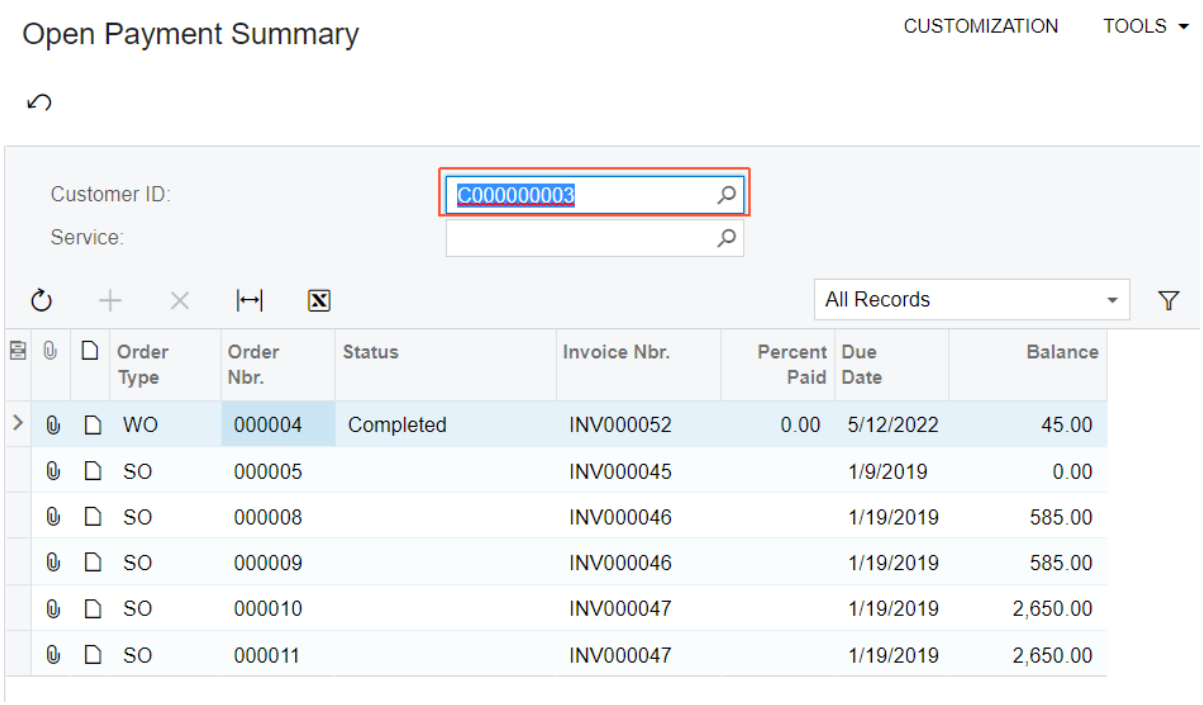
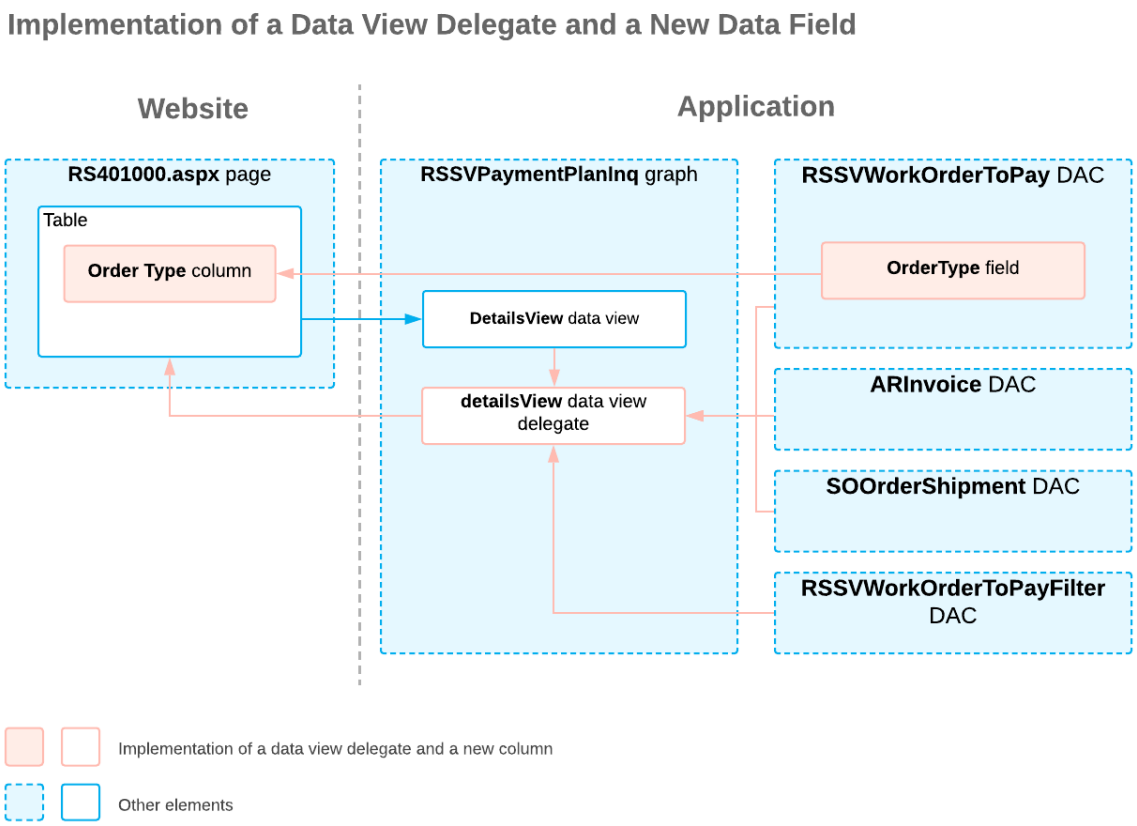


Figure: The Open Payment Summary form for a particular customer

Lesson Summary

In this lesson, you have learned how to define a data view delegate. You have also learned how to display different types of entities in one grid by using a data view delegate.

The following diagram shows the components that you have implemented or modified in this lesson.



Lesson 1.4: Retrieve Aggregated Data

On the Open Payment Summary (RS401000) form, employees of the Smart Fix company need to have the option to view subtotals of the debt for orders of each status. To view this information, users will select a check box in the Selection area of the form, and the results in the grid will be grouped by the order status and subtotal amounts for each status will be calculated.

In this lesson, you will add a filtering parameter: the **Show Total Amount to Pay** check box. You will also update dynamic queries in the data view delegate so that they change when a user selects or clears the **Show Total Amount to Pay** check box.

Lesson Objectives

As you complete this lesson, you will learn how to aggregate data in a fluent BQL query.

Step 1.4.1: Add the Show Total Amount to Pay Check Box

To give a user the ability to view grouped data in the grid and subtotal amounts for each status, you need to add a check box on the Selection area of the Open Payment Summary (RS401000) form by doing the following:

1. In the `RSSVWorkOrderToPayFilter` DAC, add the following field.

```
        #region GroupByStatus
        [PXBool]
```

```
        [PXUIField(DisplayName = "Show Total Amount to Pay")]
        public bool? GroupByStatus { get; set; }
        public abstract class groupByStatus :
            PX.Data.BQL.BqlBool.Field<groupByStatus>
        { }
        #endregion
```

2. Build the project.
3. Add the following check box to the `Content` section of the `RS401000.aspx` file that defines the Selection area. (Add the check box after the `ServiceID` field.)

```
      <px:PXCheckBox CommitChanges="True" runat="server"
        ID="CstPXCheckBoxGroupByStatus" DataField="GroupByStatus"/>
```

4. Publish the customization project.

Step 1.4.2: Modify the Data View Delegate

In the `detailsView` delegate, you need to use different queries depending on the state of the **Show Total Amount to Pay** check box. If the check box is selected, you need to group all the selected data by the status and calculate the subtotal amounts to be paid for each status.

To group or aggregate records, you will append the `AggregateTo<>` clause to the statement and specify the grouping condition and aggregation function by using the `GroupBy` clause and the `Sum` aggregation function. For details on other aggregation functions, see *To Select Records by Using Fluent BQL*.

Do the following:

1. Replace the `detailsView` delegate with the following code.

```
        protected virtual IEnumerable detailsView()
        {
            BqlCommand query;
            var filter = Filter.Current;
            if (filter.GroupByStatus != true)
            {
                query = new SelectFrom<RSSVWorkOrderToPay>.InnerJoin<ARInvoice>.
                    On<ARInvoice.refNbr.IsEqual<RSSVWorkOrderToPay.invoiceNbr>>.
                  Where<RSSVWorkOrderToPay.status.IsNotEqual<
                      RSSVWorkOrderWorkflow.States.paid>.
                    And<RSSVWorkOrderToPayFilter.customerID.FromCurrent.IsNull.
                      Or<RSSVWorkOrderToPay.customerID.IsEqual<
                        RSSVWorkOrderToPayFilter.customerID.FromCurrent>>>.
                      And<RSSVWorkOrderToPayFilter.serviceID.FromCurrent.IsNull.
                        Or<RSSVWorkOrderToPay.serviceID.IsEqual<
                          RSSVWorkOrderToPayFilter.serviceID.FromCurrent>>>>();
            }
            else
            {
                query = new SelectFrom<RSSVWorkOrderToPay>.InnerJoin<ARInvoice>.
                    On<ARInvoice.refNbr.IsEqual<RSSVWorkOrderToPay.invoiceNbr>>.
                  Where<RSSVWorkOrderToPay.status.IsNotEqual<
                      RSSVWorkOrderWorkflow.States.paid>.
                    And<RSSVWorkOrderToPayFilter.customerID.FromCurrent.IsNull.
                      Or<RSSVWorkOrderToPay.customerID.IsEqual<
                        RSSVWorkOrderToPayFilter.customerID.FromCurrent>>>.
```

```
                    And<RSSVWorkOrderToPayFilter.serviceID.FromCurrent.IsNull.
                      Or<RSSVWorkOrderToPay.serviceID.IsEqual<
                        RSSVWorkOrderToPayFilter.serviceID.FromCurrent>>>>.
                  AggregateTo<GroupBy<RSSVWorkOrderToPay.status>,
               Sum<ARInvoice.curyDocBal>>();
            }
            var view = new PXView(this, true, query);
            foreach (PXResult<RSSVWorkOrderToPay, ARInvoice> order in
                view.SelectMulti(null))
            {
                if (filter.GroupByStatus == true)
                {
                    ((RSSVWorkOrderToPay)order[0]).OrderNbr = "";
                    ((RSSVWorkOrderToPay)order[0]).PercentPaid = null;
                    ((RSSVWorkOrderToPay)order[0]).InvoiceNbr = "";
                    ((ARInvoice)order[1]).DueDate = null;
                }
                yield return order;
            }

            var sorders = SelectFrom<SOOrderShipment>.InnerJoin<ARInvoice>.
                On<ARInvoice.refNbr.IsEqual<SOOrderShipment.invoiceNbr>>.
                Where<RSSVWorkOrderToPayFilter.customerID.FromCurrent.IsNull.
                Or<SOOrderShipment.customerID.IsEqual<
                    RSSVWorkOrderToPayFilter.customerID.FromCurrent>>>.
                    View.Select(this);
            foreach (PXResult<SOOrderShipment, ARInvoice> order in sorders)
            {
                SOOrderShipment soshipment = order;
                ARInvoice invoice = order;
                RSSVWorkOrderToPay workOrder = RSSVWorkOrderToPay(soshipment);
                workOrder.OrderType = OrderTypeConstants.SalesOrder;
                var result = new PXResult<RSSVWorkOrderToPay, ARInvoice>(
                    workOrder, invoice);
                yield return result;
            }
        }
```

In the code above, first you declare the `query` variable. You will use it later to assign a query depending on the filter value. Then you get the current value of the filter. Depending on whether the **Show Total Amount to Pay** check box is selected, you assign a value to the `query` variable. If the **Show Total Amount to Pay** check box is selected, you construct a query in which you group data by the `Status` field value by using the `AggregateTo` clause.

In the `AggregateTo` clause, you group data by the `RSSVWorkOrderToPay.status` value, and calculate the sum for each group. Then you return the results of the query.

In the grid, you do not display values in the **Order Nbr**, **Percent Paid**, **Invoice Nbr**, and **Due Date** columns for aggregated data, because that would not make any sense.

To calculate a value for each group, you can use the following aggregation functions: `Min`, `Max`, `Sum` (which is used in this case), `Avg`, and `Count`.

2. Build the project.

Step 1.4.3: Test the Aggregation of Data

To test how data is grouped and calculated on the Open Payment Summary (RS401000) form, do the following:

1. In the Selection area of the Open Payment Summary form, select the **Show Total Amount to Pay** check box.
   The form should look as shown in the following screenshot.

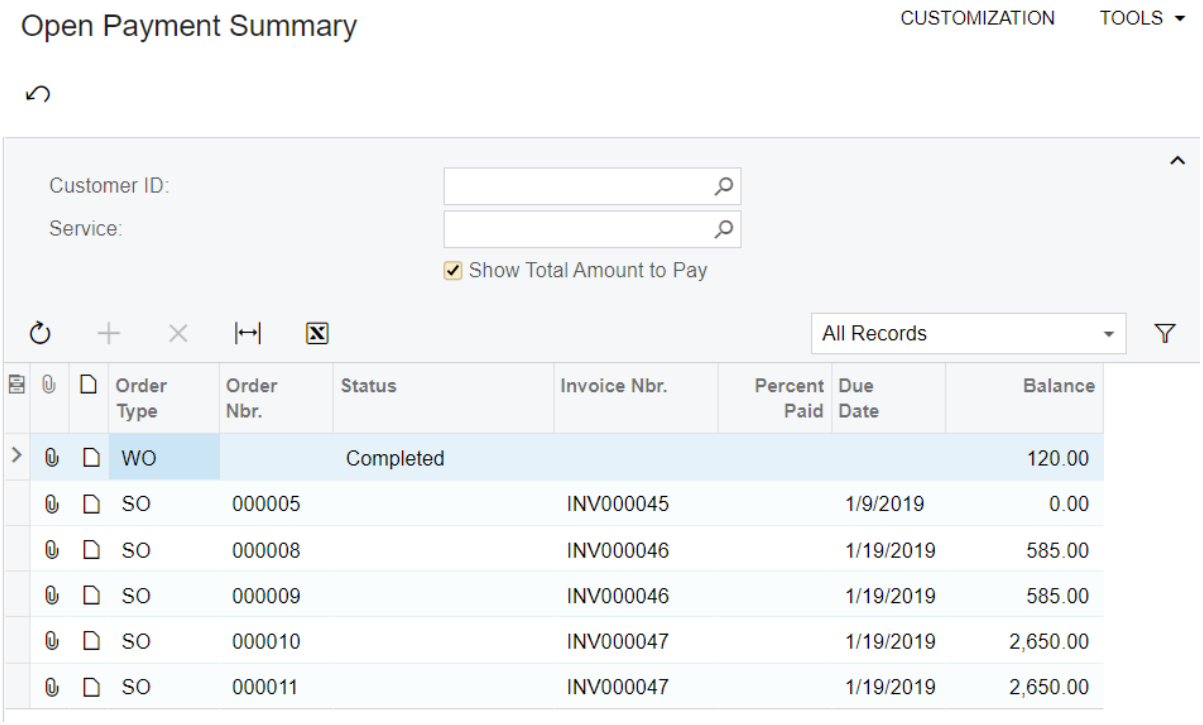


Figure: The filtered and aggregated data on the Open Payment Summary form

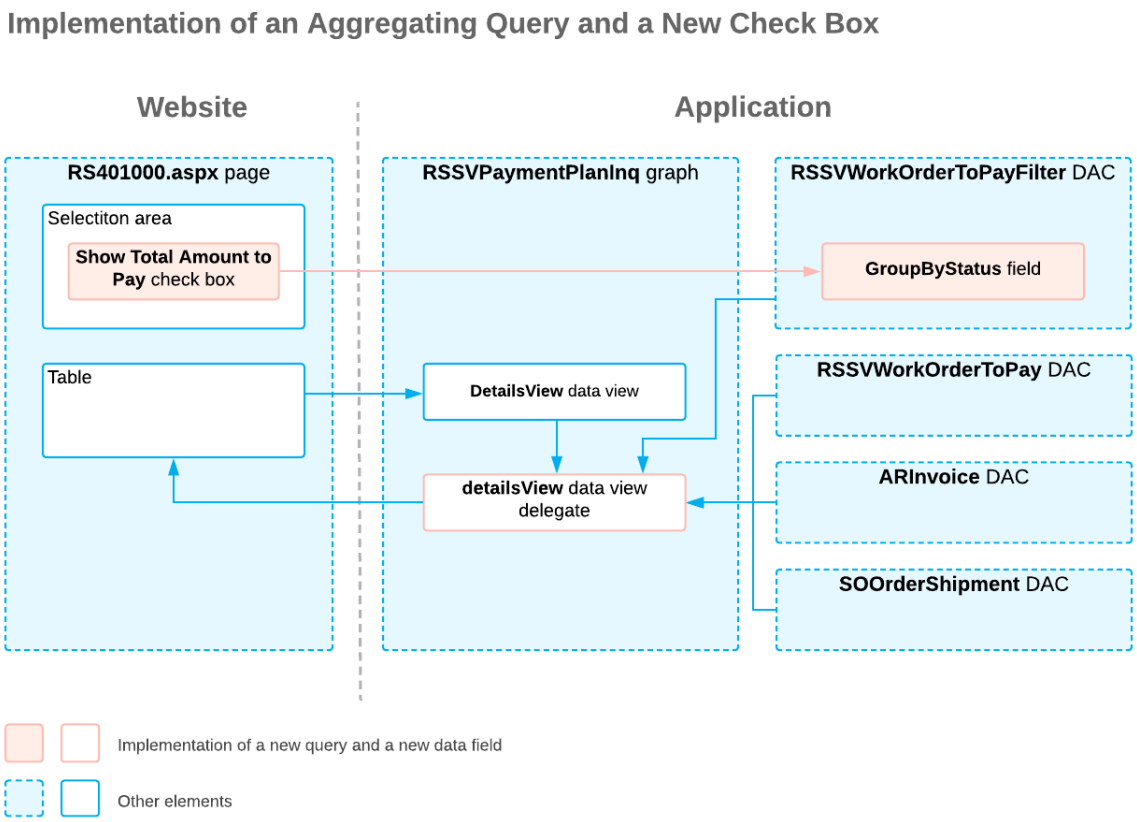
Notice that amount of the grid lines has changed. The **Balance** column now displays the total amount to be paid for all orders of a status displayed in the **Status** column.

> No sales orders are grouped because the **Status** column displays no data for sales orders. This happens because the sets of statuses for sales orders and repair work orders are different, and the status of a sales order cannot be converted to the status of a repair work order.

Lesson Summary

In this lesson, you have learned how to group data and calculate values for grouped data. Also, you have learned how to assign different queries depending on the selected filter value.

The following diagram shows the components that you have implemented or modified in this lesson.



Lesson 1.5: Add Redirection Links to the Grid

For easy navigation between the rows of the grid on the Open Payment Summary (RS401000) form and the repair work orders, sales orders, and invoices listed in these lines, users need to have a fast way to navigate to the form with detailed information about the order or invoice.

In this lesson, you will replace the text numbers in the **Order Nbr.** and **Invoice Nbr.** columns with links to the grid links that users can click to open the data entry form for the order or invoice whose number the user has clicked; the user can then view the data and make any needed modifications. You will add these links in two ways: by configuring the ASPX file and by declaring an action.

Lesson Objectives

As you complete this lesson, you will learn how to implement a redirection inside an action handler.

Step 1.5.1: Add a Link by Using the PXSelector Attribute (Self-Guided Exercise)

In the step, you will provide a redirection link to the *Invoices* (SO303000) form in the **Invoice Nbr.** column so that a user can review the details of the invoice and edit them.

You should provide this link in the same way as was used in the *T210 Customized Forms and Master-Detail Relationship* and *T230 Actions* courses:

1. Make sure the `PXSelector` attribute is present on the `InvoiceNbr` field of the `RSSVWorkOrder` DAC. The `RSSVWorkOrderToPay` DAC, which is used on the Open Payment Summary (RS401000) form, inherits the `InvoiceNbr` field, including its attributes.
2. In the `RS401000.aspx` file, add the `CommitChanges="True"` attribute to the `PXGridColumn` object for the `InvoiceNbr` column.
3. In the `PXGridLevel` container, add the `RowTemplate` element and, inside it, the `PXSelector` attribute as shown in the following code.

```
<RowTemplate>
  <px:PXSelector ID="edInvoiceNbr" runat="server"
      DataField="InvoiceNbr" Enabled="False" AllowEdit="True" />
</RowTemplate>
```

4. Publish the customization project.

Step 1.5.2: Add a Link by Using an Action

There are two types of orders displayed on the Open Payment Summary (RS401000) form: work orders and sales orders. Thus, when a user clicks an order number in the **Order Nbr.** column of the grid, the corresponding form should be opened: If a work order is selected, the Repair Work Orders (RS301000) form should be opened; if a sales order is selected, the *Sales Orders* (SO301000) form should be opened. The described behavior cannot be implemented using only ASPX and attributes. To implement this logic, you need to declare an action, and inside the action method, implement a redirection to the corresponding form.

In this step, you will implement an action that redirects the user to the Repair Work Orders or *Sales Orders* form, depending on the order type of the selected line.

Redirecting to Pages

Acumatica Framework supports the following types of redirection:

- To another form of the Acumatica Framework-based application
- To a report
- To a generic inquiry form
- To any destination URL

You can add redirection from a selector control declaratively, by adding the attributes to the data access class and to the selector control. Such redirection is often used for opening the data entry form from which the user can edit the record selected in the selector control.

To implement a redirection in an action, you need to throw one of the exceptions provided by Acumatica Framework. Once an exception is thrown, it interrupts the current context and propagates up the call stack until it is handled by Acumatica Framework, which performs the redirection. (This mechanism doesn't affect the performance of the application.) You don't need to implement the handling of the exceptions that are used for redirection.

The following exceptions are used for redirection:

- `PXRedirectRequiredException` opens the specified application page in the same window or a new one. By default, the user is redirected in the same window.
- `PXPopupRedirectException` opens the specified application page in a pop-up window.
- `PXReportRequiredException` opens the specified report in the same window or a new one. By default, the report opens in the same window.

- `PXRedirectWithReportException` opens two pages: the specified report in a new window, and the specified application page in the same window.
- `PXRedirectToUrlException` opens the webpage with the specified external URL in a new window. This exception is also used for opening an inquiry page that is loaded into the same window by default.

To Add a Link to a Form

To implement redirection, do the following:

1. In the `RSSVPaymentPlanInq` graph, define the `ViewOrder` action as follows.

```
public PXAction<RSSVWorkOrderToPay> ViewOrder;
[PXButton(DisplayOnMainToolbar = false)]
[PXUIField]
protected virtual void viewOrder()
{
    RSSVWorkOrderToPay order = DetailsView.Current;
    // if this is a repair work order
    if (order.OrderType == OrderTypeConstants.WorkOrder)
    {
        // create a new instance of the graph
        var graph = PXGraph.CreateInstance<RSSVWorkOrderEntry>();
        // set the current property of the graph
        graph.WorkOrders.Current = graph.WorkOrders.
          Search<RSSVWorkOrder.orderNbr>(order.OrderNbr);
        // if the order is found by its ID,
        // throw an exception to open the order in a new tab
        if (graph.WorkOrders.Current != null)
        {
            throw new PXRedirectRequiredException(graph, true,
              "Repair Work Order Details");
        }
    }
    // if this is a sales order
    else
    {
        // create a new instance of the graph
        var graph = PXGraph.CreateInstance<SOOrderEntry>();
        // set the current property of the graph
        graph.Document.Current = graph.Document.
          Search<RSSVWorkOrder.orderNbr>(order.OrderNbr);
        // if the order is found by its ID,
        // throw an exception to open the order in a new tab
        if (graph.Document.Current != null)
        {
            throw new PXRedirectRequiredException(graph, true,
              "Sales Order Details");
        }
    }
}
```

In the action method, depending on the type of the order, you create a new instance of the `RSSVWorkOrderEntry` or `SOOrderEntry` graph. In the graph, you set the `Current` property of the primary view's `PXCache` to the order if it is found by the specified ID.

> To learn the primary view name, you can apply the Element Inspector to the Summary area of the entry form.

If the current data record is set for the `PXCache` object, you throw `PXRedirectRequiredException` to open the form with the current data record displayed.

2. Build the project.
3. In the `RS401000.aspx` file, do the following:
   - For the `PXGrid` element, set the `SyncPosition` property to `True`.
   - In the grid column for the `OrderNbr` data field, specify the action name in the `LinkCommand` property as follows.

```
<px:PXGridColumn DataField="OrderNbr" Width="72"
  LinkCommand="ViewOrder" />
```

4. Publish the customization project.

> If you needed to make a redirection to only the Repair Work Orders (RS301000) form, you could do it declaratively, without using an action. (This is similar to the redirection you performed for the **Invoice Nbr.** column, which redirected to only one form.) To do this, you would add the `[PXPrimaryGraph(typeof(RSSVWorkOrderEntry))]` attribute to the `RSSVWorkOrder` DAC to define a graph to be created by default for the `RSSVWorkOrder` DAC, and make changes in the ASPX file that are similar to those described in *Step 1.5.1: Add a Link by Using the PXSelector Attribute (Self-Guided Exercise)*.

Step 1.5.3: Test the Redirection Links

To test the redirection links that you have implemented, do the following:

1. In Acumatica ERP, open the Open Payment Summary (RS401000) form.

   The form should look as shown in the following screenshot.

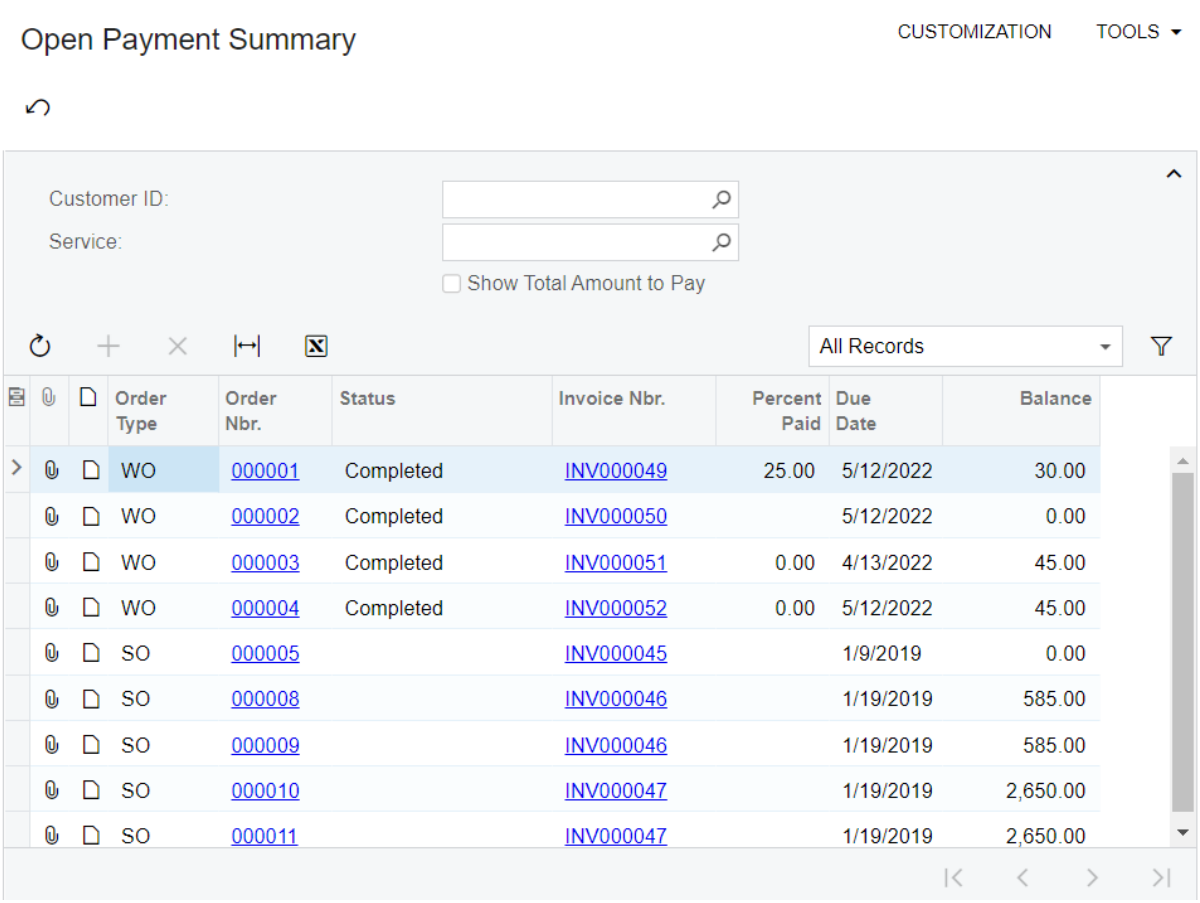


Figure: The links on the Open Payment Summary form

2. Click the sales order number *000005*.

   In a new tab, the *Sales Orders* (SO301000) form opens with the *000005* sales order displayed.
3. On the Open Payment Summary form, click the repair work order number *000004*.

   In a new tab, the Repair Work Orders (RS301000) form opens with the *000004* repair work order displayed.
4. On the Open Payment Summary form, click the invoice number for the repair work order number *000004*.

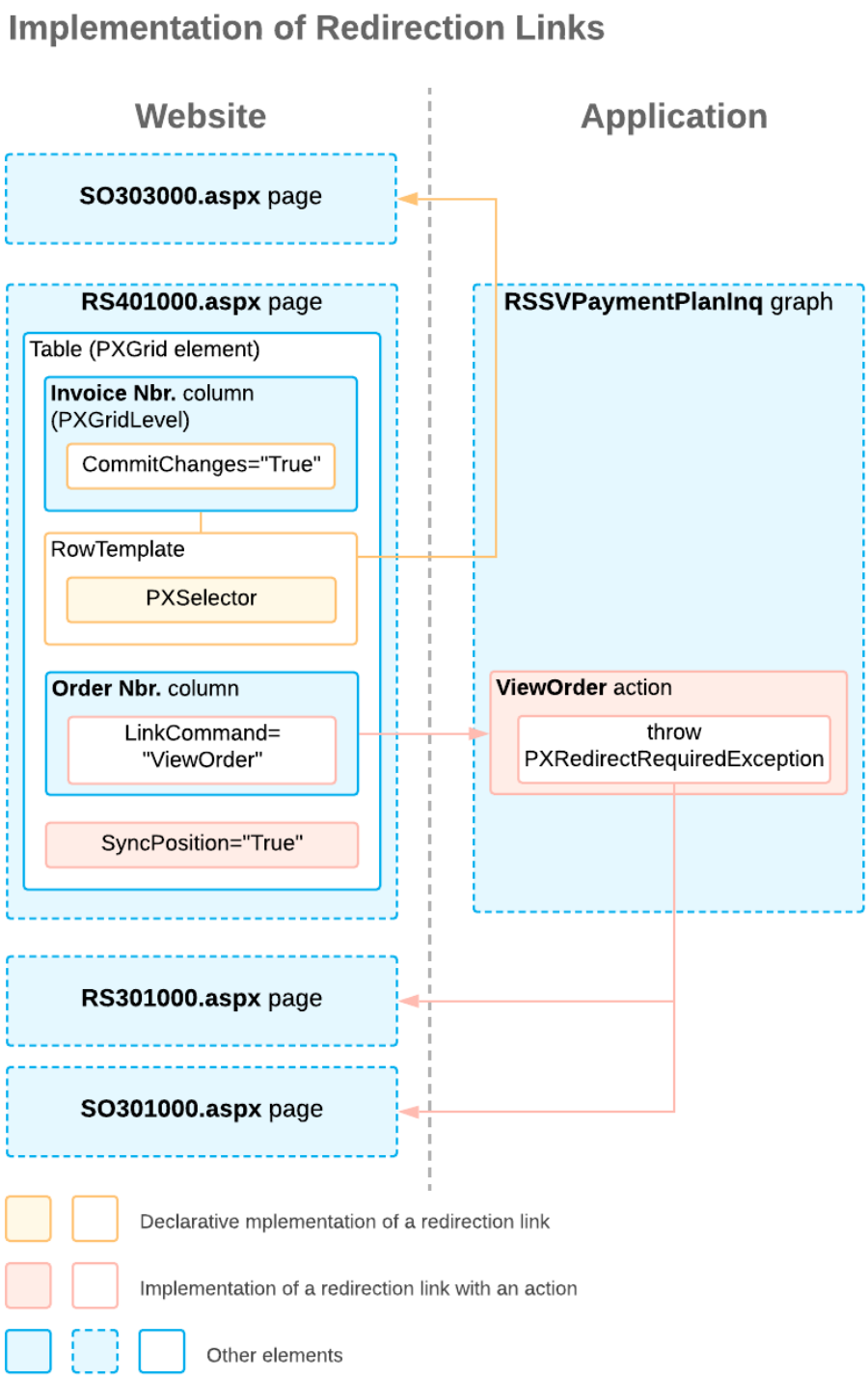
   The *Invoices* (SO303000) form should be opened in a new window with the invoice displayed.

> Depending on type of the invoice, the *Invoices and Memos* (AR301000) form may be opened instead of the *Invoices* form. The logic that determines which form to open is embedded in Acumatica ERP.

Lesson Summary

In this lesson, you have added redirection links to the **Order Nbr.** and **Invoice Nbr.** columns. You have learned how to implement redirection by using actions and exceptions.

The following diagram shows the components that you have implemented or modified in this lesson.



Review Questions

1. Which attribute should you use to add a reusable filter to the grid on the inquiry form?
   a. `PXCacheName`

   b. `PXFilter`
   c. `PXFilterable`
   d. `PXGrid`
2. Which class should you use to define a data view for the filter on the inquiry form?
   a. `PXHidden`
   b. `PXFilter`
   c. `PXFilterable`
   d. `PXSummary`
3. How do you determine the name of a data view delegate?
   a. The data view delegate should have the same name as the data view.
   b. The data view delegate should have the same name as the data view except that you use a different case of the first letter of the name.
   c. The data view delegate should be named `detailsView`.
4. Select all functions that you can use to calculate values in the `AggregateTo<>` clause.
   a. `Max`
   b. `Min`
   c. `And`
   d. `Or`
   e. `Sum`
   f. `Avg`
   g. `Count`
   h. `Power`
5. Select all ways that you can add a redirection link to a table column.
   a. By using the `PXSelector` attribute and configuring the ASPX page
   b. By configuring a callback in the ASPX page
   c. By defining an action and configuring the ASPX page

Answer Key

1. C
2. B
3. B
4. A, B, E, F, G
5. A, C

Part 2: The Payment Info Tab

In the previous part, you have implemented an inquiry form that displays payment information about repair work orders and sales orders that have not yet been paid. In this part, you will add a tab, **Payment Info**, to the Repair Work Orders (RS301000) form that will display information on the invoice related to the repair work order and the most recent payment. This tab will be displayed on the form only if the repair work order has been paid.

The tab will have the following elements:

- **Invoice Nbr.**: The number of the invoice that has been created for the repair work order
- **Due Date**: The due date for the invoice
- **Latest Payment**: The number of the payment that was the most recent payment applied to the invoice
- **Latest Amount Paid**: The amount paid in the payment that was applied to the invoice most recently

This set of data is derived from different DACs. To display the UI elements on a single tab, you will learn how to use the `PXProjection` attribute.

About the PXProjection attribute

If you need to display data from multiple tables on a form (or a tab), you need to declare a DAC with the `PXProjection` attribute, which implements the projection of data from one table or multiple tables into a single DAC.

The `PXProjection` attribute binds the DAC to an arbitrary data set defined by the `Select` command. The framework doesn't bind this DAC to a database table (that is, doesn't select data from the table having the same name as the DAC). Instead, you specify an arbitrary fluent BQL `Select` command that is executed to retrieve data for the DAC. The `Select` command can select data from one command or multiple commands and can include any BQL clauses. An example of the `PXProjection` attribute usage is shown in the following code.

```
[PXProjection(typeof(
    SelectFrom<Supplier>.InnerJoin<SupplierProduct>.
      On<SupplierProduct.accountID.IsEqual<Supplier.accountID>>))]
```

In the projection DAC, you should explicitly map the projection fields to the database column retrieved by the `Select` command. To map a field, set the `BqlField` property of the attribute (such as `PXDBString` and `PXDBDecimal`) that binds the field to the database to the type that represents the column, as follows.

```
[PXDBString(15, IsUnicode = true, BqlField = typeof(Supplier.accountCD))]
```

Related Links

- *PXProjectionAttribute Class*

Lesson 2.1: Add the Payment Info Tab

In this lesson, you will add and configure a new tab on the Repair Work Orders (RS301000) form. On this tab, you will display fields from the `ARInvoice` and `ARPayment` DACs. To display these fields, you will use the `PXProjection` attribute.

Lesson Objectives

As you complete this lesson, you will learn how to display data from multiple DACs by using the `PXProjection` attribute.

Step 2.1.1: Define the DAC

In this step, you will define a DAC by using the `PXProjection` attribute. First you will find out which DACs you need to use in a fluent BQL query of the `PXProjection` attribute. Then you will declare the DAC and its fields.

Do the following:

1. Learn which DACs you should use to display information about the invoice and its applications:
   a. On the *Invoices* (SO303000) form, apply the Element Inspector to the Summary area of the form to learn the DAC name for the invoice, and to the **Applications** tab to learn the DAC name for payments that have been applied to the invoice. Notice that these are the `ARInvoice` and `ARAdjust2` DACs, respectively.
   b. Learn the key fields of the `ARInvoice` DAC, which you will need to know to select records in a fluent BQL query. The key fields you need to select an invoice are `ARInvoice.refNbr` and `ARInvoice.docType`.
   c. Analyze the code of the `ARAdjust2` DAC: It is inherited from the `ARAdjust` DAC so you can use the `ARAdjust` DAC.
   d. Analyze the code of the `ARInvoice` and `ARAdjust` DACs and the fields that are defined in them.

      You will need the following fields:

      - For the invoice number, the `ARInvoice.refNbr` field
      - For the invoice due date, the `ARINvoice.dueDate` field
      - For the payment number, the `ARAdjust.adjgRefNbr` field
      - For the payment amount, the `ARAdjust.curyAdjdAmt` field
2. In the `DAC` folder of the `PhoneRepairShop_Code` project, create the `RSSVWorkOrderPayment.cs` file.
3. Add the following `using` directives:

```
using PX.Data;
using PX.Data.BQL.Fluent;
using PX.Objects.AR;
```

4. Add the `RSSVWorkOrderPayment` DAC, as shown in the following code.

```
namespace PhoneRepairShop
{
    [PXCacheName("Invoice and Payment of the Repair Work Order")]
    [PXProjection(typeof(SelectFrom<PX.Objects.AR.ARInvoice>.
        InnerJoin<ARAdjust>.On<ARAdjust.adjdRefNbr.IsEqual<ARInvoice.refNbr>.
            And<ARAdjust.adjdDocType.IsEqual<ARInvoice.docType>>>.
        AggregateTo<
            Max<ARAdjust.adjgDocDate>,
            GroupBy<ARAdjust.adjdRefNbr>,
            GroupBy<ARAdjust.adjdDocType>>))]
    public class RSSVWorkOrderPayment : IBqlTable
    {
    }
```

```
}
```

In the query of the `PXProjection` attribute, you select an invoice and all payments applied to the invoice. To sort the payments by the date, you use the `AggregateTo` clause. Inside the clause, you group all payments by their invoice number and document type (which are the same because all payments selected are applied to the same invoice) and select the payment with the latest document date.

5. Add to the `RSSVWorkOrderPayment` DAC the fields you learned in Instruction 1, as the following code shows.

```
        #region InvoiceNbr
        [PXDBString(15, IsUnicode = true, IsKey = true, InputMask = "",
          BqlField = typeof(ARInvoice.refNbr))]
        [PXUIField(DisplayName = "Invoice Nbr.", Enabled = false)]
        public virtual String InvoiceNbr { get; set; }
        public abstract class invoiceNbr :
            PX.Data.BQL.BqlString.Field<invoiceNbr> { }
        #endregion

        #region DueDate
        [PXDBDate(BqlField = typeof(PX.Objects.AR.ARInvoice.dueDate))]
        [PXUIField(DisplayName = "Due Date", Enabled = false)]
        public virtual DateTime? DueDate { get; set; }
        public abstract class dueDate :
            PX.Data.BQL.BqlDateTime.Field<dueDate> { }
        #endregion

        #region AdjgRefNbr
        [PXDBString(BqlField = typeof(ARAdjust.adjgRefNbr))]
        [PXUIField(DisplayName = "Latest Payment", Enabled = false)]
        public virtual String AdjgRefNbr { get; set; }
        public abstract class adjgRefNbr :
            PX.Data.BQL.BqlString.Field<adjgRefNbr> { }
        #endregion

        #region CuryAdjdAmt
        [PXDBDecimal(BqlField = typeof(ARAdjust.curyAdjdAmt))]
        [PXUIField(DisplayName = "Latest Amount Paid", Enabled = false)]
        public virtual Decimal? CuryAdjdAmt { get; set; }
        public abstract class curyAdjdAmt :
            PX.Data.BQL.BqlDecimal.Field<curyAdjdAmt> { }
        #endregion
```

Note that each field has the PXDB<type> attribute with the `BqlField` parameter specified to set up the projection.

Although the `RSSVWorkOrderPayment` DAC has a master-detail relationship with the `RSSVWorkOrder` DAC, you do not need to add any `PXDBDefault` and `PXParent` attributes to the fields because all field values are determined by the query in the `PXProjection` attribute.

6. Build the project.

Step 2.1.2: Define the Data View

In this step, you will define the data view that will be used on the **Payment Info** tab of the Repair Work Orders (RS301000) form.

Do the following:

1. In the `RSSVWorkOrderEntry` class, add the following member to the `Views` region of the class.

```
public SelectFrom<RSSVWorkOrderPayment>.
    Where<RSSVWorkOrderPayment.invoiceNbr.IsEqual<
        RSSVWorkOrder.invoiceNbr.FromCurrent>>.
    View Payments;
```

   In the view, you select data from the `RSSVWorkOrderPayment` DAC with same invoice number (stored in the `RSSVWorkOrder` DAC) as in the Summary area of the form.

2. Build the project.

Step 2.1.3: Add the Tab Item (Self-Guided Exercise)

In this step, you will create a new tab item named **Payment Info** on the Repair Work Orders (RS301000) form. To do this, you can use the Screen Editor or define the tab manually in the `RS301000.aspx` file. The tab should contain the `PXFormView` container. In the `PXFormView` container, define the UI elements for the fields you added in the `RSSVWorkOrderPayment` DAC. The elements should be organized in a single column.

Bind the `PXFormView` container to the `Payments` data view that you created in *Step 2.1.2: Define the Data View*.

The **Payment Info** tab should look as shown on the following screenshot.

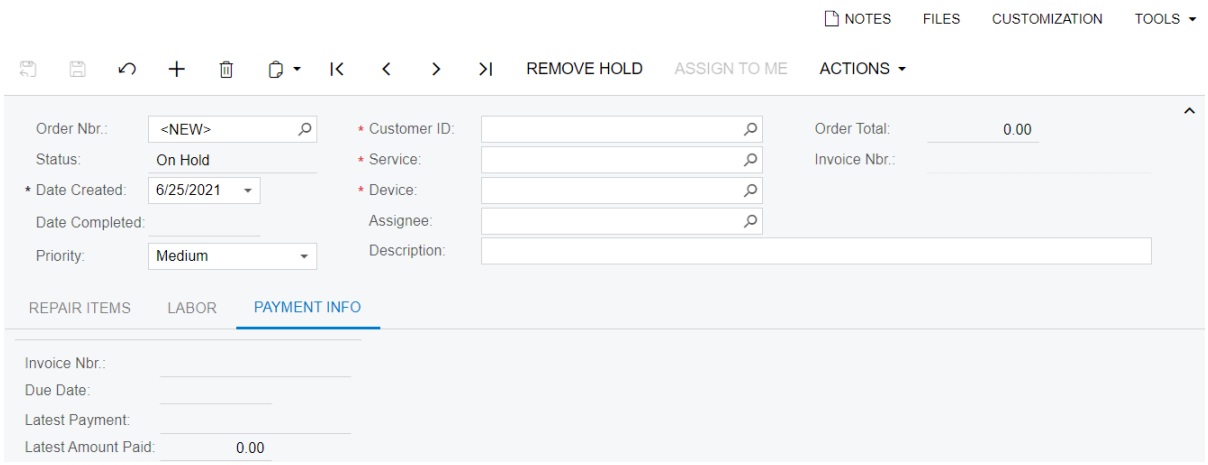


Figure: The Payment Info tab preview

For details on how to define a tab item, see the *T210 Customized Forms and Master-Detail Relationship* course or the *Tab Item Container (PXTabItem)* topic.

Step 2.1.4: Test the Implemented Tab

To test the **Payment Info** tab of the Repair Work Orders (RS301000) form, do the following:

1. On the Repair Work Orders (RS301000) form, open the *000001* repair work order.
2. Open the **Payment Info** tab, which looks as follows.

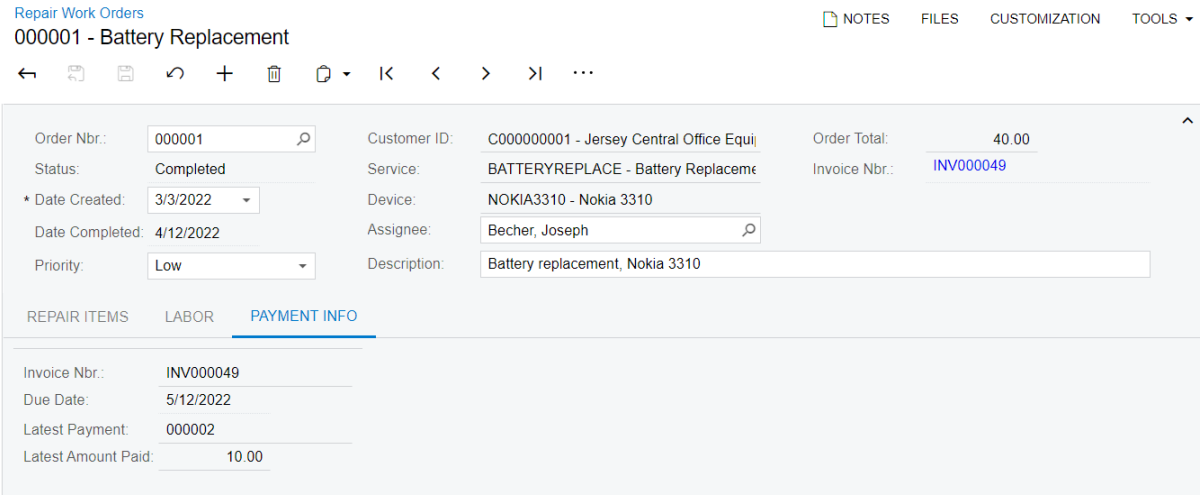
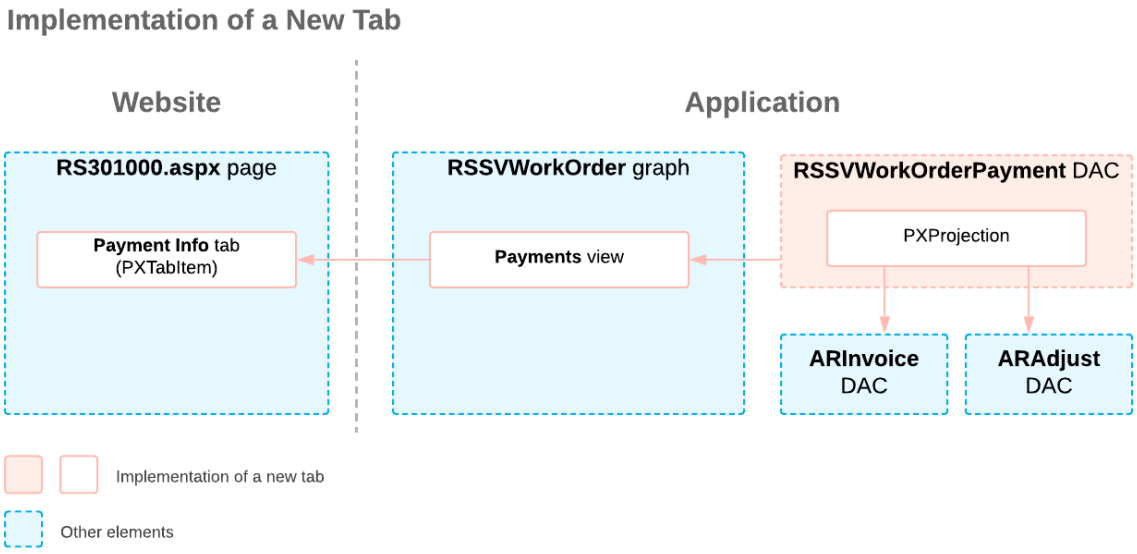


Figure: The Payment Info tab

Lesson Summary

In this lesson, you have learned how to display information from multiple DACs on a single tab. To do this, you have defined a new DAC with the `PXProjection` attribute, and specified the `BqlField` property value for each field of the new DAC.

The following diagram shows the components that you have implemented or modified in this lesson.



Review Questions

1. Where can you use the `PXProjection` attribute?
   a. With a DAC

   b. With a DAC field
   c. With a data view
   d. With an action
2. What property should you specify for all fields in the `PXProjection` DAC?
   a. `DisplayName`
   b. `Visibility`
   c. `BqlField`
   d. `IsKey`

Answer Key

1. A
2. C

Appendix: Reference Implementation

You can find the reference implementation of the customization described in this course in the `Customization\T250` folder of the *Help-and-Training-Examples* repository in Acumatica GitHub.

Appendix: Deploying the Needed Acumatica ERP Instance for the Training Course

> If for some reason you cannot complete the instructions in *Step 2: Preparing the Needed Acumatica ERP Instance for the Training Course*, you can create an Acumatica ERP instance as described in this topic and manually publish the needed customization project as described in *Appendix: Publishing the Required Customization Project*.

You deploy an Acumatica ERP instance and configure it as follows:

1. To deploy a new application instance, open the Acumatica ERP Configuration Wizard, and do the following:
   a. On the Database Configuration page, type the name of the database: `PhoneRepairShop`.
   b. On the Tenant Setup page, set up a tenant with the *T100* data inserted by specifying the following settings:
      - **Login Tenant Name**: `MyTenant`
      - **New**: Selected
      - **Insert Data**: *T100*
      - **Parent Tenant ID**: *1*
      - **Visible**: Selected
   c. On the **Instance Configuration** page, in the **Local Path of the Instance** box, select a folder that is outside of the `C:\Program Files (x86)`, `C:\Program Files`, and `C:\Users` folder. We recommend that you store the website folder outside of these folders to avoid an issue with permission to work in these folders when you perform customization of the website.

   The system creates a new Acumatica ERP instance, adds a new tenant, and loads the selected data to it.
2. Sign in to the new tenant by using the following credentials:
   - Username: `admin`
   - Password: `setup`

   Change the password when the system prompts you to do so.
3. In the top right corner of the Acumatica ERP screen, click the username and then click **My Profile**. On the **General Info** tab of the *User Profile* (SM203010) form, which the system has opened, select *YOGIFON* in the **Default Branch** box; then click **Save** on the form toolbar.

   In subsequent sign-ins to this account, you will be signed in to this branch.
4. Optional: Add the *Customization Projects* (SM204505) and *Generic Inquiry* (SM208000) forms to your favorites. For details about how to add a form to favorites, see *Managing Favorites: General Information*.

To be able to create and pay invoices, configure the instance as follows:

1. On the *Enable/Disable Features* (CS100000) form, enable the *Advanced SO Invoices* feature.
2. On the *Item Classes* (IN201000) form, for the Stock Item class, select the **Allow Negative Quantity** box and click **Save**.
3. On the *Accounts Receivable Preferences* (AR101000) form, clear the **Validate Document Totals on Entry** and **Require Payment Reference on Entry** boxes to simplify the process of releasing an invoice. Click **Save**.

Appendix: Publishing the Required Customization Project

> If for some reason you cannot complete the instructions in *Step 2: Preparing the Needed Acumatica ERP Instance for the Training Course*, you can create an Acumatica ERP instance as described in *Appendix: Deploying the Needed Acumatica ERP Instance for the Training Course* and manually publish the needed customization project as described in this topic.

You load the customization project with the results of the *T230 Actions* training course and publish this project as follows:

1. On the *Customization Projects* (SM204505) form, create a project with the name *PhoneRepairShop*, and open it.
2. In the menu of the Customization Project Editor, click **Source Control > Open Project from Folder**.
3. In the dialog box that opens, specify the path to the `Customization\T230\PhoneRepairShop` folder, which you have downloaded from Acumatica GitHub, and click **OK**.
4. Bind the customization project to the source code of the extension library as follows:
   a. Copy the `Customization\T230\PhoneRepairShop_Code` folder to the `App_Data\Projects` folder of the website.

      > By default, the system uses the `App_Data\Projects` folder of the website as the parent folder for the solution projects of extension libraries.
      >
      > If the website folder is outside of the `C:\Program Files (x86)`, `C:\Program Files`, and `C:\Users` folders, we recommend that you use the `App_Data\Projects` folder for the project of the extension library.
      >
      > If the website folder is in the `C:\Program Files (x86)`, `C:\Program Files`, or `C:\Users` folder, we recommend that you store the project outside of these folders to avoid an issue with permission to work in these folders. In this case, you need to update the links to the website and library references in the project.

   b. Open the solution, and build the `PhoneRepairShop_Code` project.
   c. In the menu of the Customization Project Editor, click **Extension Library > Bind to Existing**.
   d. In the dialog box that opens, specify the path to the `App_Data\Projects\PhoneRepairShop_Code` folder, and click **OK**.
5. In the menu of the Customization Project Editor, click **Publish > Publish Current Project**.

The published customization project contains all changes to the Acumatica ERP website and database that have been performed in the previous training courses of the *T* series. This project also contains the customization plug-in that fills in the tables created in these training courses with the custom data entered in these training courses. For details about the customization plug-ins, see *To Add a Customization Plug-In to a Project*; the creation of customization plug-ins is outside of the scope of this course.