

MODULE 7: STATISTICS

Module Overview

In this module you add statistics to the Seminar Management module. Seminar managers at CRONUS International Training Academy require immediate and flexible financial reporting. Microsoft Dynamics NAV 2013 meets this business need by using FlowFilters and FlowFields.

Objectives

The objectives are:

- Create a page that calculates price sums efficiently.
- Make the page available from the Seminar pages.
- Use FlowFilters to easily calculate statistics for different time periods.

Prerequisite Knowledge

FlowFilters are useful for limiting calculations so that they include only the values in a column that have specific properties. For example, on the **Seminar Statistics** page, users may want to sum the total price of a seminar four times, for four time periods (such as week, month, current year, and prior year). This is possible if the application takes advantage of SumIndexField Technology (SIFT) by using FlowFilter fields with the FlowFields. Use FlowFilters to determine how much information the system includes when it calculates the contents of FlowFields. Use a FlowFilter to filter a FlowField.

Using FlowFilters and FlowFields

A FlowField is defined by setting the FieldClass property of the field to FlowField. The CalcFormula property defines the functionality of the FlowField. The CalcFormula can include filter values that are based on constant and/or variable parameters. A FlowFilter is a specific type of filter field that is defined in the same table that contains the associated FlowField. Therefore, you can apply FlowFilters to the source tables on which FlowFields are based.

To implement a statistics page by using the FlowFields and FlowFilter fields in a master table, view Table 18 **Customer** and Page 151 **Customer Statistics**. The columns of the **Customer Statistics Sales** FastTab show the Sales (LCY) field for the following four time periods:

- This Period
- This Year
- Last Year
- To Date

The data that is shown in these fields is generated by a FlowField, Sales (LCY), and several FlowFilters in the **Customer** table. The CalcFormula that is shown in the Sales (LCY) field properties uses several FlowFilters, but just consider the Date Filter now.

In the OnAfterGetRecord trigger of the **Customer Statistics** page, the Date Filter is set for each desired time period by using the Date Filter-Calc codeunit. Then use the **CALCFIELDS** function for each Date Filter to calculate a value for the Sales (LCY). Use similar logic when you create the **Seminar Statistics** page.

For more information about SIFT, FlowFields, and FlowFilters, refer to the Microsoft Dynamics NAV 2013 Developer and IT Pro Help.

Seminar Statistics

Seminar statistics lets the user quickly and easily retrieve an overview of the price statistics for a specific seminar.

Solution Analysis

You can use FlowFields and FlowFilters on the seminar solution to provide statistics as described in the functional requirements in Module 1, Business Case Diagnosis and Analysis.

The client requires statistics for different time periods, such as for a month, for last year, for this year, and up to the current date.

This requirement indicates that the client wants to open a **Statistics** page from a **Seminar** page. This page calculates the statistics for the total price and shows it for the four time periods that are listed.

Seminar managers should have access to the seminar statistics from a **Seminar Detail** page. This page calculates the total price statistics for the seminar for the time periods that are indicated in the function requirements.

Solution Design

The **Seminar Statistics** page must be available from the **Related Information** menu on the **Seminar Card** and **Seminar List** pages. The **Seminar Statistics** page automatically calculates the statistics for the selected seminar by using the information from the **Seminar Ledger Entry** page.

The **Seminar Statistics** page displays statistical information for one seminar, as shown in the "Seminar Statistics Page" figure.

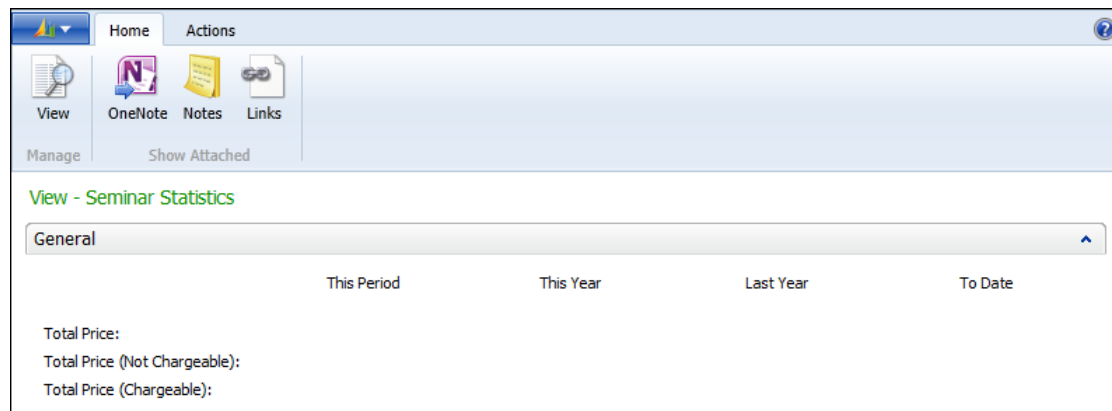


FIGURE 7.1: THE SEMINAR STATISTICS PAGE (123456714)

Seminar Card (Page 123456700): The **Seminar** menu selection on the **Related Information** button on this page is changed to include a new command for seminar statistics.

Seminar List (Page 123456701): The **Seminar** menu selection on the **Related Information** button on this page is changed to include a new command for seminar statistics.

The solution requires the addition of FlowFields and FlowFilters to the **Seminar** table (123456700). Also, a key of Seminar No., Posting Date, Charge Type, Chargeable is added to the **Seminar Ledger Entry** table 123456732.

Use values from the **Seminar Ledger Entry** page to calculate the Total Price, Total Price (Chargeable) and Total Price (Not Chargeable) in the **Seminar** table, for four time periods. Use an array of four dimensions to store the totals for each of these three prices. Use the standard DateFilter-Calc codeunit to calculate date filters for the time periods. With the date filters, you can filter the Seminar table and use it to calculate the price fields that are shown on the page for each time period.

Lab 7.1: Creating FlowFields for Sums

Scenario

You need FlowFields to support the planned **Statistics** page.

Exercise 1: Implement FlowFields for sums in the Seminar solution.

Task 1: Add Flowfields to the solution.

High Level Steps

1. Follow these steps to implement FlowFields for sums in this solution.

Detailed Steps

1. Follow these steps to implement FlowFields for sums in this solution.
 - a. Add a secondary key of Seminar No., Posting Date, Charge Type, Chargeable to the **Seminar Ledger Entry** table (1123456732). Set the property for the key so that the **Total Price** field is the sum index field.
 - b. Add fields to the **Seminar** table (123456700) as shown in the following table.

No.	Field Name	Type	Length	Comment
20	Date Filter	Date		FlowFilter
21	Charge Type Filter	Option		FlowFilter; Options: Instructor, Room, Participant, Charge
25	Total Price	Decimal		FlowField; refer to Step 3 in this topic for the CalcFormula. Must be noneditable. AutoFormatType=1
26	Total Price (Not Chargeable)	Decimal		FlowField; refer to Step 4 in this topic for the CalcFormula. Must be noneditable. AutoFormatType=1

No.	Field Name	Type	Length	Comment
27	Total Price (Chargeable)	Decimal		FlowField; refer to Step 5 in this topic for the CalcFormula. Must be noneditable. AutoFormatType=1

- c. Set the CalcFormula property for the **Total Price** field so that it calculates the sum of the **Total Price** field on the **Seminar Ledger Entry** table for the records where the following occurs:
 - **Seminar No.** field corresponds to the **No.** field.
 - **Posting Date** corresponds to the **Date Filter**.
 - **Charge Type** corresponds to the **Charge Type Filter**.

- d. Set the CalcFormula property for the **Total Price (Not Chargeable)** field so that it calculates the sum of the **Total Price** field on the **Seminar Ledger Entry** table for the records where the following occurs:
 - **Seminar No.** corresponds to the **No.** field.
 - **Posting Date** corresponds to the **Date Filter**.
 - **Charge Type** corresponds to the **Charge Type Filter**.
 - Records are Chargeable.

- e. Set the CalcFormula property for the **Total Price (Chargeable)** field so that it calculates the sum of the **Total Price** field on the **Seminar Ledger Entry** table for the records where the following occurs:
 - **Seminar No.** corresponds to the **No.** field.
 - **Posting Date** corresponds to the **Date Filter**.
 - **Charge Type** corresponds to the **Charge Type Filter**.
 - Records are Chargeable.

Lab 7.2: Creating the Seminar Statistics Page

Scenario

A **Seminar Statistics** page is required.

Exercise 1: Implement a Statistics Page

Exercise Scenario

Follow the approach that you used for other statistics pages and use the table changes that you just completed to create a **Seminar Statistics** page. Make it accessible from the **Seminar Card** and **List** pages.

Task 1: Create the Seminar Statistics Page

High Level Steps

1. Follow these steps to implement the **Statistics** page.
2. Enter code in the appropriate trigger so that after the page retrieves the record, the program performs the following tasks.
3. Add a ContentArea Container to the page. Add an indented Group with label General to the ContentArea.
4. Add a **Group** without a label and with a subtype of FixedLayout. This is the frame for the statistics area of this page. The values are populated by defining columns for all four (4) dimensions.
5. Repeat step 5 for three more groups. Label these groups as follows: This Year, Last Year, and To Date. Make sure each of these three groups has appropriately increasing dimension values.
6. Make the page available from the two seminar pages. Add the selections that are described in the table of the **Related Information** menu of the **Seminar Card** page (123456700) after the **Comments** command.
7. Add the same menu selections to the **Seminar List** page (123456701).

Detailed Steps

1. Follow these steps to implement the **Statistics** page.
 - a. Create the **Seminar Statistics** page (123456714), based on the **Seminar** table. A statistics page has a PageType of Card, and has the LinksAllowed property set to No. Do not add any controls to this page at this time.

- b. Define the following global variables for the page.

Name	Data Type	Sub Type	Length
DateFilterCalc	Codeunit	DateFilter-Calc	
SeminarDateFilter	Text		30
SeminarDateName	Text		30
CurrentDate	Date		
TotalPrice	Decimal		
TotalPriceNotChargeable	Decimal		
TotalPriceChargeable	Decimal		
I	Integer		

- c. Set the Dimensions property for all the variables except DateFilterCalc, CurrentDate, and I so that each variable is an array of four dimensions.
- d. Set the property for the page so that it is noneditable.
2. Enter code in the appropriate trigger so that after the page retrieves the record, the program performs the following tasks.
- Filters the table to the selected seminar.
 - If the CurrentDate is not the work date, the program sets the CurrentDate variable to the work date.
 - Runs the **CreateAccountingPeriodFilter** function of the DateFilter-Calc codeunit with parameters of the first dimensions of the SeminarDateFilter and SeminarDateName, the CurrentDate, and **0** (zero).
 - Runs the **CreateFiscalYearFilter** function of the DateFilter-Calc codeunit with parameters of the second dimensions of the **SeminarDateFilter** and **SeminarDateName**, the **CurrentDate**, and **0**.
 - Runs the **CreateFiscalYearFilter** function of the DateFilter-Calc codeunit with parameters of the third dimensions of the **SeminarDateFilter** and **SeminarDateName**, the **CurrentDate**, and the value -1. **HINT:** There is similar code on the Customer Statistics page.
 - For each dimension, filters the table to records where the Date Filter corresponds to the value in the appropriate dimension of the SeminarDateFilter and calculates the **Total Price**, **Total Price (Not Chargeable)**, and **Total Price (Chargeable)** fields.
 - Sets the value for the appropriate dimension of the TotalPrice, TotalPriceNotChargeable, and TotalPriceChargeable to the values in the corresponding fields.

- h. Filters the table to those records where the Date Filter is before the CurrentDate.
- i. In the OnAfterGetRecord trigger verify the code resembles:

Code Example

```
SETRANGE("No.,"No.");

IF CurrentDate <> WORKDATE THEN BEGIN

    CurrentDate := WORKDATE;

    DateFilterCalc.CreateAccountingPeriodFilter(SeminarDateFilter[1],SeminarDateName[1],CurrentDate,0);

    DateFilterCalc.CreateFiscalYearFilter(SeminarDateFilter[2],SeminarDateName[2],CurrentDate,0);

    DateFilterCalc.CreateFiscalYearFilter(SeminarDateFilter[3],SeminarDateName[3],CurrentDate,-1);

END;

FOR i := 1 TO 4 DO BEGIN

    SETFILTER("Date Filter",SeminarDateFilter[i]);

    CALCFIELDS("Total Price","Total Price (Not Chargeable)","Total Price (Chargeable)");

    TotalPrice[i] := "Total Price";

    TotalPriceNotChargeable[i] := "Total Price (Not Chargeable)";

    TotalPriceChargeable[i] := "Total Price (Chargeable)";

END;

SETRANGE("Date Filter",0D,CurrentDate);
```

- 3. Add a ContentArea Container to the page. Add an indented Group with label General to the ContentArea.
 - a. In the Page Designer, on the first line set Type to Container and SubType to ContentArea

- b. Goto the second line and set Type to Group and Subtype to Group and Caption to General and make sure it is indented one step to the right using the right arrow button.

4. Add a **Group** without a label and with a subtype of FixedLayout. This is the frame for the statistics area of this page. The values are populated by defining columns for all four (4) dimensions.
 - a. Goto the third line and set Type to Group and Subtype to FixedLayout.

5. Repeat step 5 for three more groups. Label these groups as follows: This Year, Last Year, and To Date. Make sure each of these three groups has appropriately increasing dimension values.
 - a. Complete the design in the Page designer so that it looks like the figure Seminar Statistics Page (123456714) In Page Designer:

E.	Type	SubType	SourceExpr	Name	Caption
▶	Container	ContentArea		<Control100000000>	<Control100000000>
▾	Group	Group		<Control100000001>	General
▾	Group	FixedLayout		<Control100000002>	<Control100000002>
▾	Group	Group		<Control100000007>	This Period
	Field		SeminarDateName[1]	<Control100000003>	<Control100000003>
	Field		TotalPrice[1]	<Control100000004>	Total Price
	Field		TotalPriceNotChargeable[1]	<Control100000005>	Total Price (Not Chargeable)
	Field		TotalPriceChargeable[1]	<Control100000006>	Total Price (Chargeable)
▾	Group	Group		<Control100000008>	This Year
	Field		SeminarDateName[2]	<Control100000009>	<Control100000009>
	Field		TotalPrice[2]	<Control100000012>	Total Price
	Field		TotalPriceNotChargeable[2]	<Control100000011>	Total Price (Not Chargeable)
	Field		TotalPriceChargeable[2]	<Control100000010>	Total Price (Chargeable)
▾	Group	Group		<Control100000013>	Last Year
	Field		SeminarDateName[3]	<Control100000017>	<Control100000017>
	Field		TotalPrice[3]	<Control100000016>	Total Price
	Field		TotalPriceNotChargeable[3]	<Control100000015>	Total Price (Not Chargeable)
	Field		TotalPriceChargeable[3]	<Control100000014>	Total Price (Chargeable)
▾	Group	Group		<Control100000022>	To Date
	Field		SeminarDateName[4]	<Control100000021>	<Control100000021>
	Field		TotalPrice[4]	<Control100000020>	Total Price
	Field		TotalPriceNotChargeable[4]	<Control100000019>	Total Price (Not Chargeable)
	Field		TotalPriceChargeable[4]	<Control100000018>	Total Price (Chargeable)

FIGURE 7.2: SEMINAR STATISTICS PAGE (123456714) IN PAGE DESIGNER

6. Make the page available from the two seminar pages. Add the selections that are described in the table of the **Related Information** menu of the **Seminar Card** page (123456700) after the **Comments** command.

a. Add the following additional **Seminar** actions:

Options	Comment
&Statistics (F7)	Opens page 123456714 Seminar Statistics for the selected Seminar . Set the Image property to Statistics.

7. Add the same menu selections to the **Seminar List** page (123456701).

a. Add the following additional **Seminar** actions:

Options	Comment
&Statistics (F7)	Opens page 123456714 Seminar Statistics for the selected Seminar . Set the Image property to Statistics.

Task 2: Solution Testing

High Level Steps

1. To test the statistics page, you must have entries in the **Seminar Ledger Entry** table with the related posted seminar registrations. Follow these steps to verify the solution implementation:

Detailed Steps

1. To test the statistics page, you must have entries in the **Seminar Ledger Entry** table with the related posted seminar registrations. Follow these steps to verify the solution implementation:
 - a. Open the **Seminar Card** page and view a seminar that has posted registrations. Verify that the seminar has ledger entries by selecting **Seminar**, and then click **Entries**.
 - b. Click Ledger Entries on the **Seminar Card** page.
 - c. Select **Seminar**, and then click **Statistics** to open the **Seminar Statistics** window.
 - d. Verify that the totals that are shown are correct for the different rows and columns. It may be convenient to apply a table filter to the **Seminar Ledger Entries** window and compare the results with the amounts that are shown in the **Seminar Statistics** window.

Module Review

Module Review and Takeaways

This module focused on creating a statistics page for seminars that sums the total price in four time periods. This statistics page is made available from the **Seminar** page **Related Information menu**. Add this functionality by using FlowFields and FlowFilters. FlowFilters and FlowFields use SIFT technology to provide filtered statistics quickly and easily.

Test Your Knowledge

Test your knowledge with the following questions.

1. How are FlowFilters used in calculations of FlowFields?

2. What are the advantages of using FlowFields to make calculations?

3. What is the purpose of a **FlowFilter** field?

4. What is the Microsoft Dynamics® NAV standard shortcut for opening a Statistics page?

Test Your Knowledge Solutions

Module Review and Takeaways

1. How are FlowFilters used in calculations of FlowFields?

MODEL ANSWER:

FlowFilters are set as filter values in the CalcFormula of FlowFields. They are used to limit the information that is retrieved when the system calculates the value of a FlowField.

2. What are the advantages of using FlowFields to make calculations?

MODEL ANSWER:

The advantages of using FlowFields are ease in developing and using fields that have calculated values and faster calculation processing. Calculating FlowFields takes several lines of C/AL code, because the filters and parameters are defined in the field's CalcFormula property. Writing code to calculate those values directly from their source tables takes significantly more effort to develop, and in some cases, may take much more processing of data to calculate.

3. What is the purpose of a **FlowFilter** field?

MODEL ANSWER:

A FlowFilter is a special type of filter field that you define in the same table that contains the associated FlowField. You can include FlowFilters in the CalcFormula of the FlowField to enable user-defined filters to be applied in the calculation of the FlowField. When you set a filter in a FlowFilter, the system includes the FlowFilter value as a filtering constraint when calculating the contents of related FlowFields.

4. What is the Microsoft Dynamics® NAV standard shortcut for opening a Statistics page?

MODEL ANSWER:

The standard keyboard shortcut for opening a Statistics page is Ctrl+Shift+J.

