

# Using SAS/EIS® to Build a Multidimensional Report

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## Abstract

The SAS/EIS product contains many pre-written objects that allow the end user to have a great deal of flexibility in developing applications rapidly. With Release 6.11 of the SAS System, SAS/EIS contained a new object that enhanced its ability to offer on-line reports within applications. This paper takes an in depth look at the Multidimensional Report Object, including some Release 6.12 changes, how to set one up, and how to customize it at run-time.

## Introduction

To accomplish its objectives, this paper is divided into two parts. In the first section, the **Introduction** will focus on : the SAS dataset, registering the dataset, and building the object. The second section will look at the vast capabilities that this object has with regard to run time customization.

The SAS dataset that will be used to illustrate the capabilities of the Multidimensional Report Object is **SASHELP.MDV**. Since this dataset ships with the SAS System, it will be fairly easy for the reader to use this paper as a guide to build the object.

To register this dataset so that it can be used with the Multidimensional Object, the user needs to get into the SAS/EIS environment. Do this by typing **eis** on the command line, or go the the PMENU facility and select **Globals**, then **Develop**, then **EIS Application Builder**. This takes the user to the main menu for SAS/EIS. Select the **Metabase** icon to open the *Metabase* window.

For the purposes of this paper, we will use the default metabase of **SASUSER.MBUSER**. If this is the first time that this metabase has

been used, it will be empty. To register a dataset in this metabase, select the **Add** button located under the *Tables* listbox. This opens the the *Select Table* window. Choose the path for the SASHELP library, then scroll down to find the the MDV dataset and select it. Choose OK to return to the *Metabase* window. You should find the **SASHELP.MDV** dataset, highlight it by clicking on it. Select the **Add** button below the *Attributes* area, this opens the *Select Attributes* window. Choose the **HIERARCH** attribute, then select OK to go to the *Tables Hierarchy* window. In this window, e will create the drilldown hierarchies for the report. First, issue the name **GEO** for the description field, then from the *Available* listbox choose the variables, **COUNTRY**, **CITY**, **COMPANY**. Make sure that they appear in the *Selected* listbox, then select the **ADD** button. **GEO** will appear in the *Hierarchies* window and we are ready to create another hierarchy. The **GEO** hierarchy will be used on the row dimension of the report and the next hierarchy will be used in the column dimension.

Supply the name **COLUMN** in the description field and choose **ORIGCITY**, **CODE**, and **TYPE** as the three variables in the new hierarchy. Select **ADD**, then **OK** to return to the *Metabase* window. We have just finished defining the drilldown hierarchies for the report. The next task is to define the analysis variables. To do this, select the **Columns** button just below the *Tables* listbox.

In the *Columns* listbox, select **SALES93**, then choose the **Add** button below the *Attributes* listbox. In the *Select Attributes* window, choose **Analysis**, then **OK**. Accept **SUM** as the statistic then select **OK** to return to the *Columns* window. Repeat this process for **SALES94**, **SALES95**, and **\_4CAST96**. When you have done this, you will have completed the registration process for the

SASHELP.MDV dataset. Return to the main menu for SAS/EIS.

The next step is to **build** the object. From the main menu, select the Build EIS icon. This takes you to the *Build* window. Use the **application database**, SASUSER.SASAPPL to build the multidimensional report. To begin, choose the *Add* pushbutton at the bottom of the Build EIS window. Select Business Reports from the *Object Database* listbox. Then select Multidimensional Reports from the *Objects* listbox. Next, select the Build pushbutton. For the Name: field, type in MDREPT. Then supply a description of "Multidimensional Report". Click on the arrow beside Table: and select the SASHELP.MDV from the *Available* listbox. Select OK. Notice the name of the table appears in the table field. Click on the arrow beside Columns: from the *Type* listbox. Select Down. Then from the *Available* listbox, select GEO. While still in the *Column Selection* window, select Across from the *Type* listbox. Then from the *Available* listbox, choose COLUMN. Select Analysis from the *Available* listbox. Then choose all the variables listed. We are finished setting up the columns (and rows) of the report, so click on OK to close the *Column Selection* window. Next, select the Statistics arrow, and choose SUM as the statistic. The report is ready to be viewed, so click on the Test pushbutton.

## Viewing the Report

When the report is displayed, do the following:

Double click on the UNITED STATES row. The report drills down to the next level in the geographical hierarchy which is CITY. The report now displays rows for all the cities in the United States. The column dimension remains the same.

Now, double click on the LONDON column. The report drills down to the next level in the COLUMN hierarchy which is CODE. The report now displays columns for the type of

delivery made from the LONDON hub to all the cities within the UNITED STATES.

Place the cursor on the NEW YORK row and single click with the LMB to highlight the row name. With the RMB, single click on 'NEW YORK' to open a selection list. Choose **Expand**. The report expands so that you can see all the companies within NEW YORK. To collapse the report, with the LMB, click on NEW YORK, then click with the RMB to get the selection list, and then select Collapse. Next, click on NEW YORK again with the LMB, and then the RMB to make the selection list appear. This time select Up to make the report rollup to the COUNTRY level.

Place the cursor on the NEXT DAY column and double click with the LMB to drill-down to the next level in the COLUMN hierarchy, which is TYPE of aircraft.

Select View, from the pmenu, then Rotate from the pmenu to give the report a better fit on the screen. Select File, then End from the pmenu to go back to the *Multidimensional Report* window.

You have been doing some run-time customization with this report. Now, let's do some build-time customization.

Select the *Customize...* button, then the *Totals* button. Select COUNTRY from the *Column* listbox, then turn totals on by clicking on the *Totals on* check box. Change the label to COUNTRY TOTALS. Add totals to any other variable if you wish.

Select the *Colors* button, then choose COUNTRY, and then select MAGENTA. Add color to any other variable of your choice. Then select OK. From the *Multidimensional Report* window, select Test to see the results of your enhancements.

There are many more run-time features of the Multidimensional Report Object. First, let's make the report a little easier to read.

From the Edit pmenu, select **Report Layout**, then **ANAYSIS** from the *Type* listbox. Deselect SALES93 and SALES94 by double clicking on them. Select OK to view the report.

Let's say that you want to view just the North American operations. Go back to the Edit pmenu and this time, choose **Subset by Dimension**. Select ORIGCITY as the dimension, then double click on NEW YORK and then SAN FRAN. Make sure they appear in the *Available* listbox. Then select OK to view the report. In the column dimension, you should see only SALES95 and \_4CAST96 within NEW YORK and SAN FRAN.

Now, suppose that you want to see what the difference is between the 1995 sales and the forecast for 1996.

While viewing the report, click on either the SALES95 or \_4CAST96 columns, then go to the pmenu facility and select Edit, then **Computed Values...** In the *Computed Values...* window, specify **Variation** for the Name field, and choose *Difference of two values* as the **Calculation type**. From the values area, choose \_4CAST96, then SALES95, (in that order). Notice the formula area. Select OK and view the report.

Next, we would like to calculate column totals. To do this, click on the NEW YORK column heading with the LMB, then go to the pmenu facility and select Edit, then **Computed Values**. In the description field, type **All Hubs**, then choose **Sum of two or more values** as the **Calculation type**. From the values area, choose **all** the cities listed, then select OK and view the report.

So far, so good. Now it's time to do some real slicing and dicing with the report. Let's say that we just want to look at only the cargo that was flown to these destinations on certain types of aircraft.

Select Edit from the pmenu facility, then **Subset by dimension...** When the next window opens, choose the variable TYPE as the dimension, then 747 as the aircraft. Select OK and view the report. Notice how the

report has changed. If you are not sure how this report has been subset, then press the RMB, and from the selection list, choose **Show Subset...** A window appears and indicates how the data is subset for the report that you are now viewing. Close this window.

Next, click with the LMB on any cell in the report that contains a numeric value. With the cell highlighted, press the RMB and from the selection window, choose **Show Detail Data...** A window appears with a listing of the observations from SASHELP.MDV that made the values in the cell you chose.

You can save the report as is, so that you do not have to point and click your way to recreating this subset again. To do this, go to the pmenu facility and click on **File**, then **Save As...** You can save the report in a number of places, but for now, select **Report**, name it **747 Cargo**, do not place it in a folder, and press the Create button. You will be prompted for the location, choose it, and then you will get a note confirming the creation of the report and its location.

## Conclusion

As one can readily see, there are many ways that you can use the Multidimensional Object in SAS/EIS to display your data. Not only are there a multitude of options and choices to be made at build time, but there are also numerous ways to customize the report at run time.

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