



Navision 2009 BI Solution

Demographics Dashboard

20th January 2020

www.businessintelligence-da.com



Introduction	3
Our First Dashboard	5
Introducing Capsules To Build Dashboards	11
Sending Data To Excel	15
Sending Data to Power Query	16
Summary About Our Dashboards	17
Thank You!	19



Hello and Welcome

Hello and welcome to this white paper on our first Navision 2009 BI Demographics Dashboard.

Thank you very much for taking the time to read this paper.

This is another white paper in our series of white papers.

We have already released white papers on:

1. Manual Partitioning of SQL Server Data Warehouses
2. Building Navision Staging Areas in a week
3. Accessing BIDA Navision Staging Areas via Meta5
4. Navision BI Sales Categories
5. Navision BI Party Profiles
6. Update to Navision BI Data Models (Large scale data model diagrams)

These white papers contain interesting and valuable information in those areas.

In this white paper we are going to give you summary, and detailed, information on how we have constructed our first Excel Dashboard.

There is a great deal of information in this paper so please be prepared to see some things that you have never seen before. Most importantly in the area of using Meta5 to place the data from the data warehouse in to the Excel "Data" workbook.

We presume you are familiar with Excel Dashboards and how they are built.

The audiences for this white paper are:

1. The end users who would like to have Excel Dashboards similar to the one we are demonstrating here.
2. The BI Project Managers/Developers who would be supporting these Excel Dashboards as part of their daily work.

So, by all means please get yourself a cup of coffee or favorite beverage because we are going to go in to quite some detail in this white paper and you will be very impressed at what you see!

Introduction to the Navision Demographic Dashboard

We have built the first Navision Dashboard in the area of Demographic Analysis to showcase how we are going to build our new Excel Dashboards for our Navision BI Solution.

Demographic analysis is an area where most companies have poor analytic capabilities. It is a good place to begin to showcase our dashboards. The dashboard shows demographics by Age Band, Income Band, Number of Dependents, Life Stage, Marital Status and Gender.

In this white paper we are going to explain how the Demographics Dashboard has been developed.

You can have this dashboard, and more, available in your company quickly and easily.

On the next page we will show the full screen of the top level dashboard.

We will comment on dashboard on the following pages.

We have developed the Dashboard using Meta5 rather than SSAS.

If you have heard the name "Ralph Kimball"? This is the software that Ralph Kimball and his colleagues brought to market in the early 80s.

Meta5 remains the best software for the "five smartest people" in any company to use to gain the greatest value from your data.

If you are one of the "five smartest people" in your company?

You should get an evaluation copy of the Starter Edition from their web site.

You will be glad you did!



Our First Dashboard!



Revenue & Units Variance By Demographics



Year

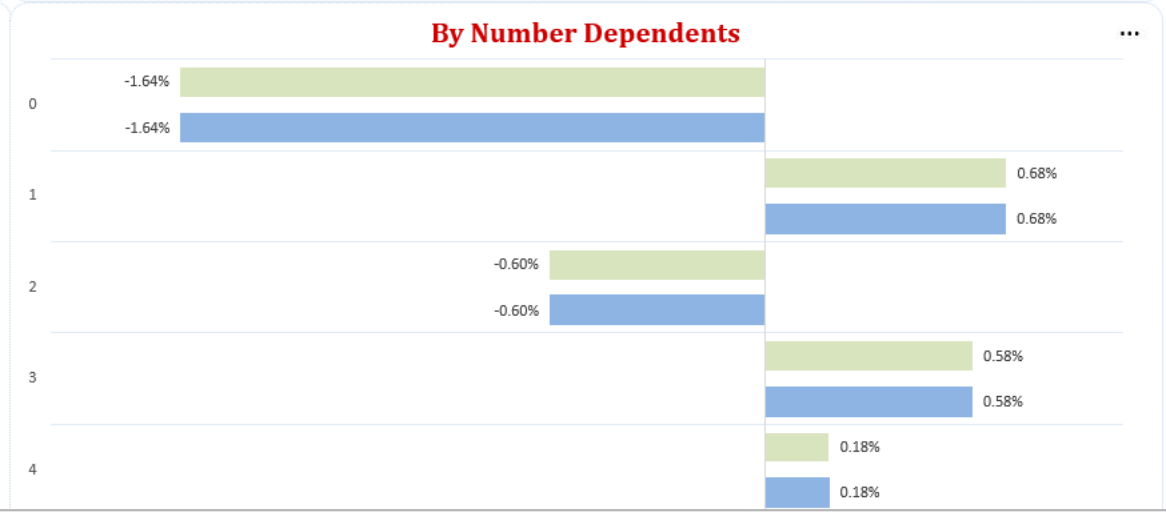
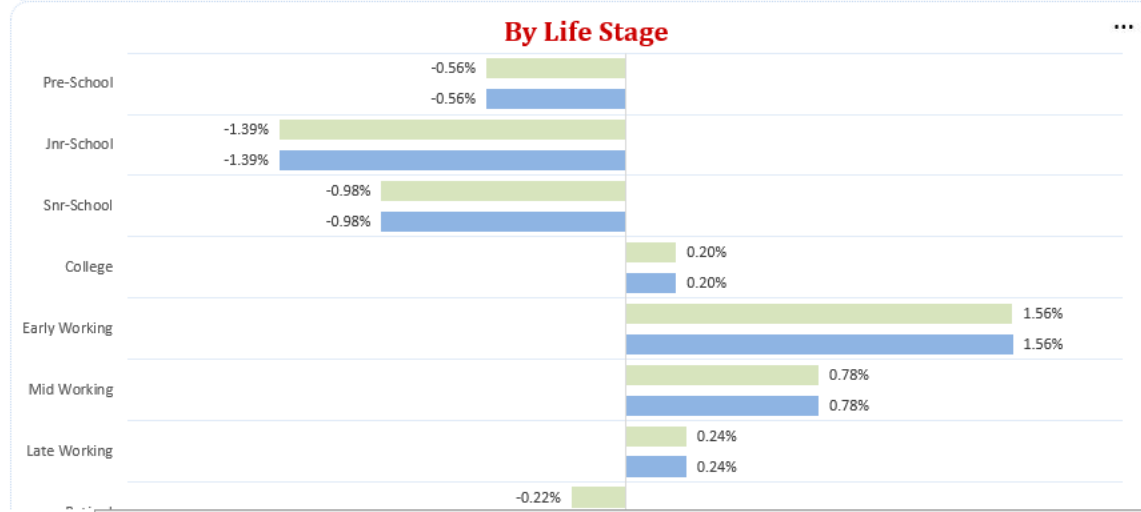
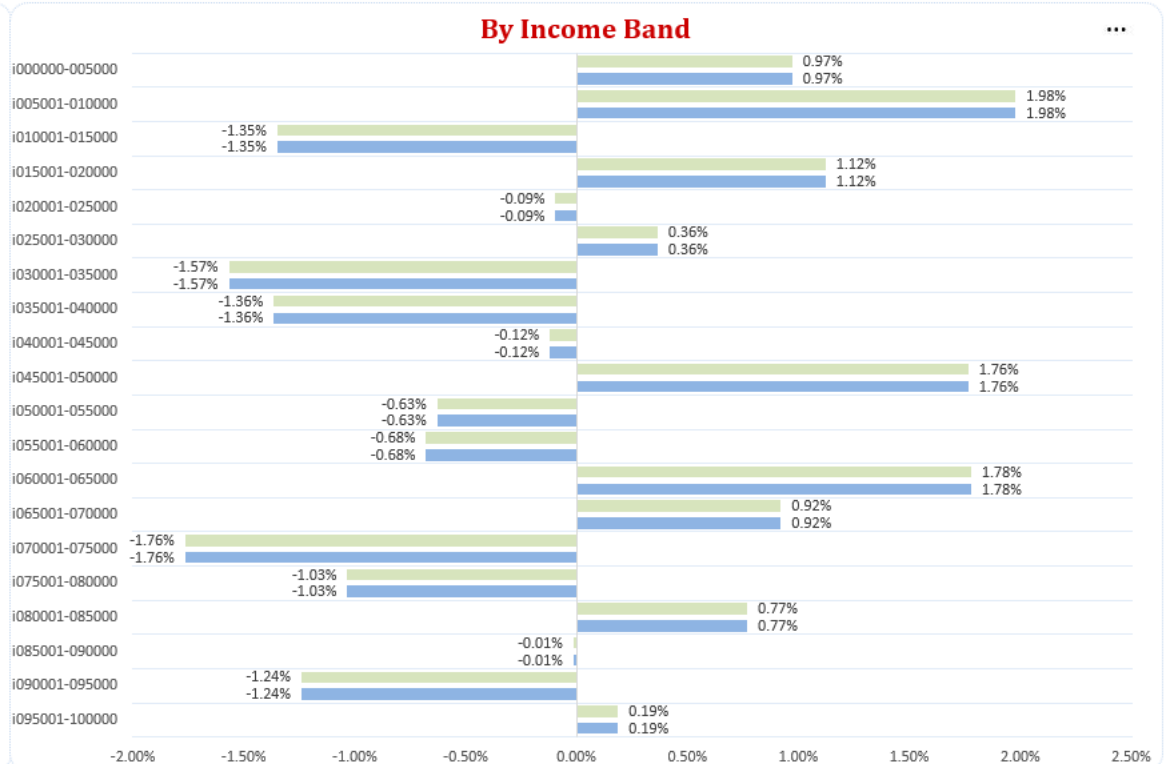
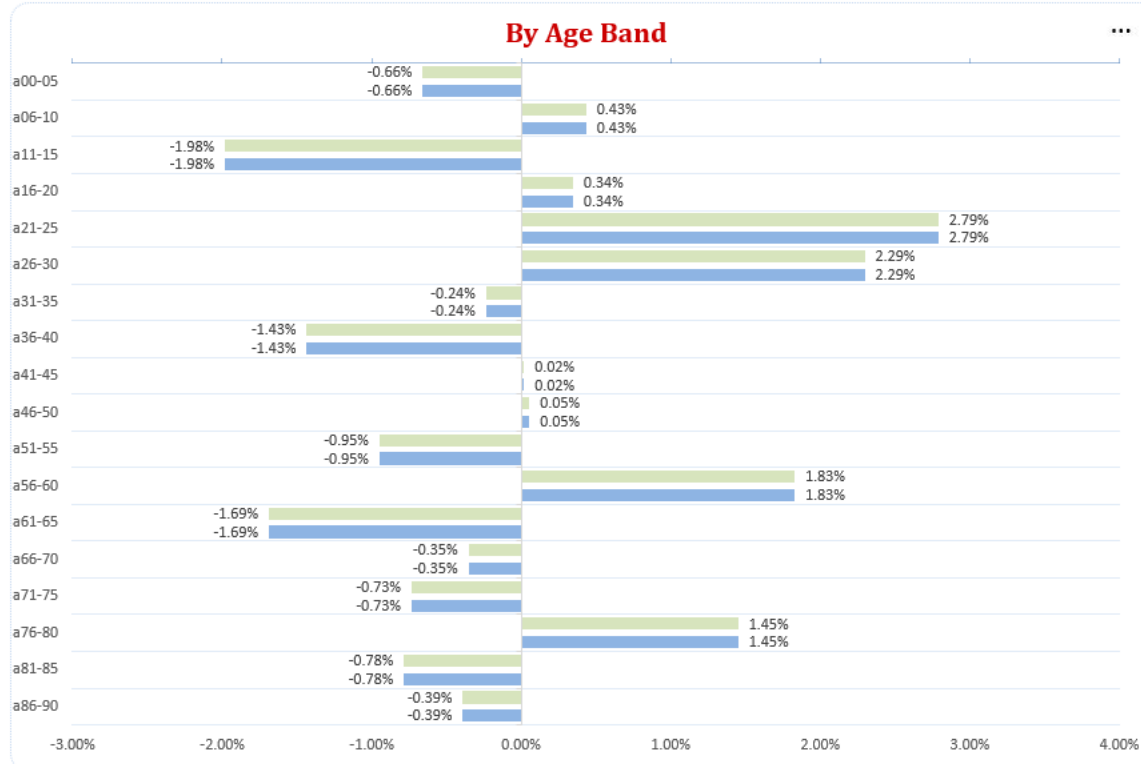
2016 2017

Month

Jan Feb Mar
Apr M... Jun
Jul Aug Sep
Oct Nov Dec

Category

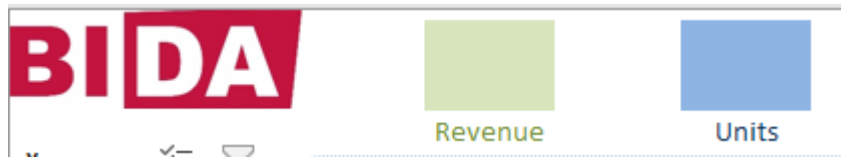
- CATEGORY-A
- CATEGORY-B
- CATEGORY-D
- CATEGORY-E
- CATEGORY-F
- CATEGORY-G
- CATEGORY-H
- CATEGORY-I
- CATEGORY-J





Features of the Dashboard

Now we will introduce you to the specific features of the dashboard. Of course, it begins with our logo, which you can replace, and the color scheme for the legend.



This is obviously followed by a meaningful report name.

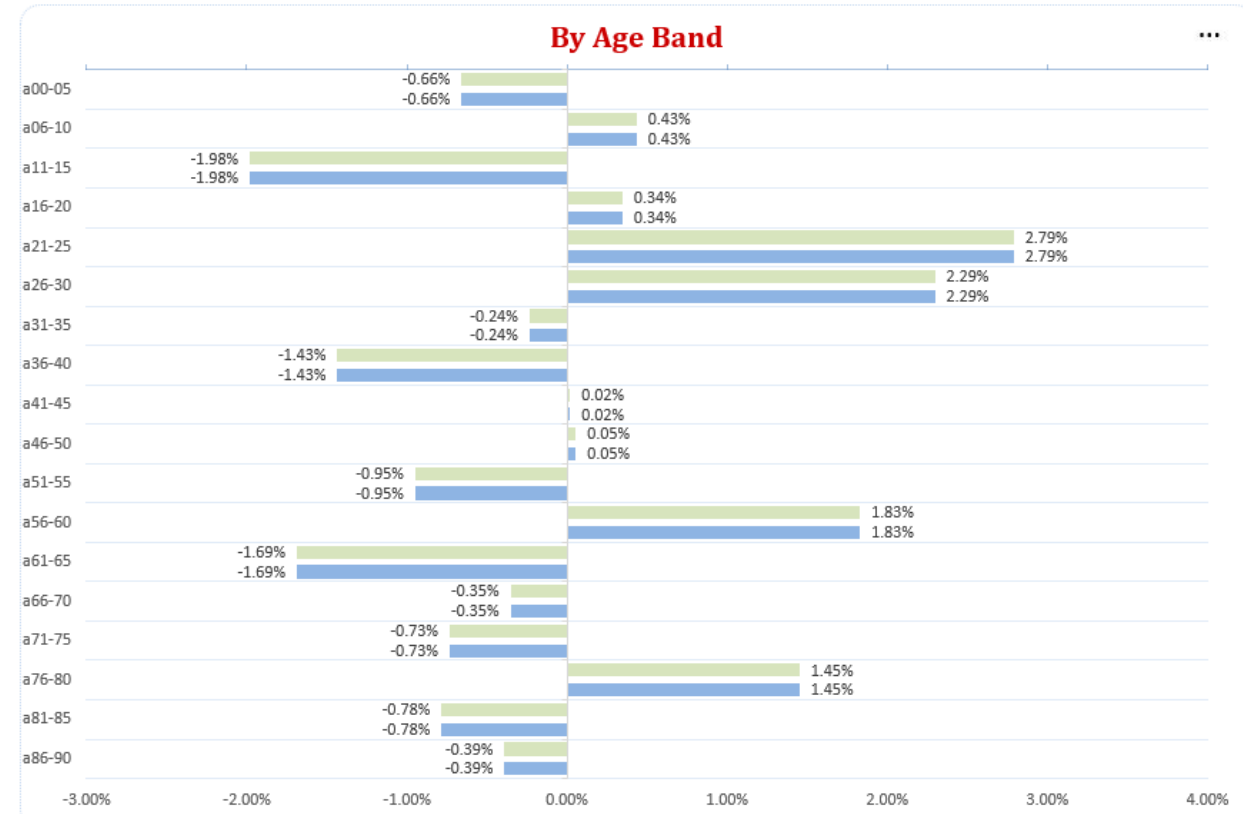
Revenue & Units Variance By Demographics

Next come the slicers. You can see there are a series of slicers for Years, Months, and Product Categories.

We have altered the product categories for our public materials. We will also note that we have removed sales records for many products so that the amounts shown on the reports are also meaningless.

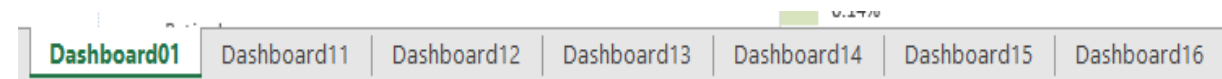
As per normal dashboards the slicers can be selected Individually or they can be selected in combinations.

These are standard Excel slicers that we presume you already know about.



Each chart shows the percentage variance of the sub group to the overall group average. The underlying data on the chart has been generated using the Meta5 random number generator.

The three dots “...” to the top right represent the drill down capability of the Dashboards. When you click on the “...” you will drill down to the underlying dashboard. There are 6 drill down dashboards. Below is the image of the tabs inside the Dashboard Workbook. We will show you the Age Band drill down dashboard on the next page.



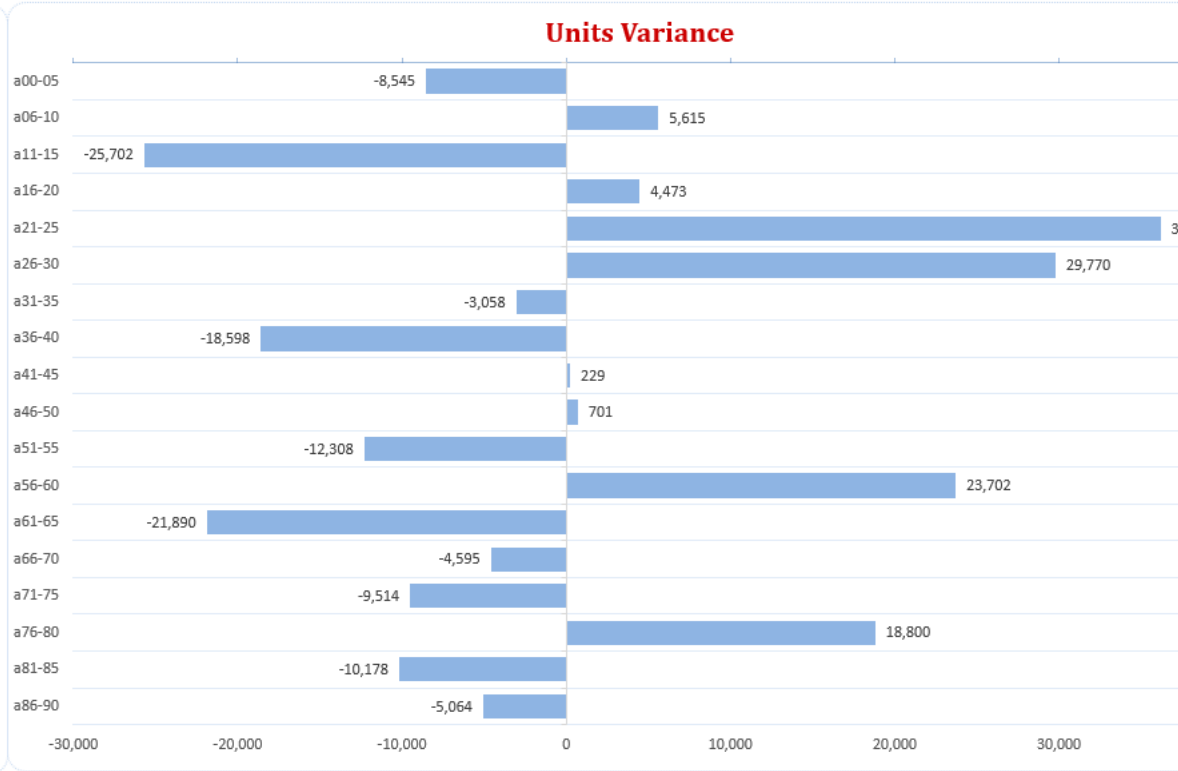
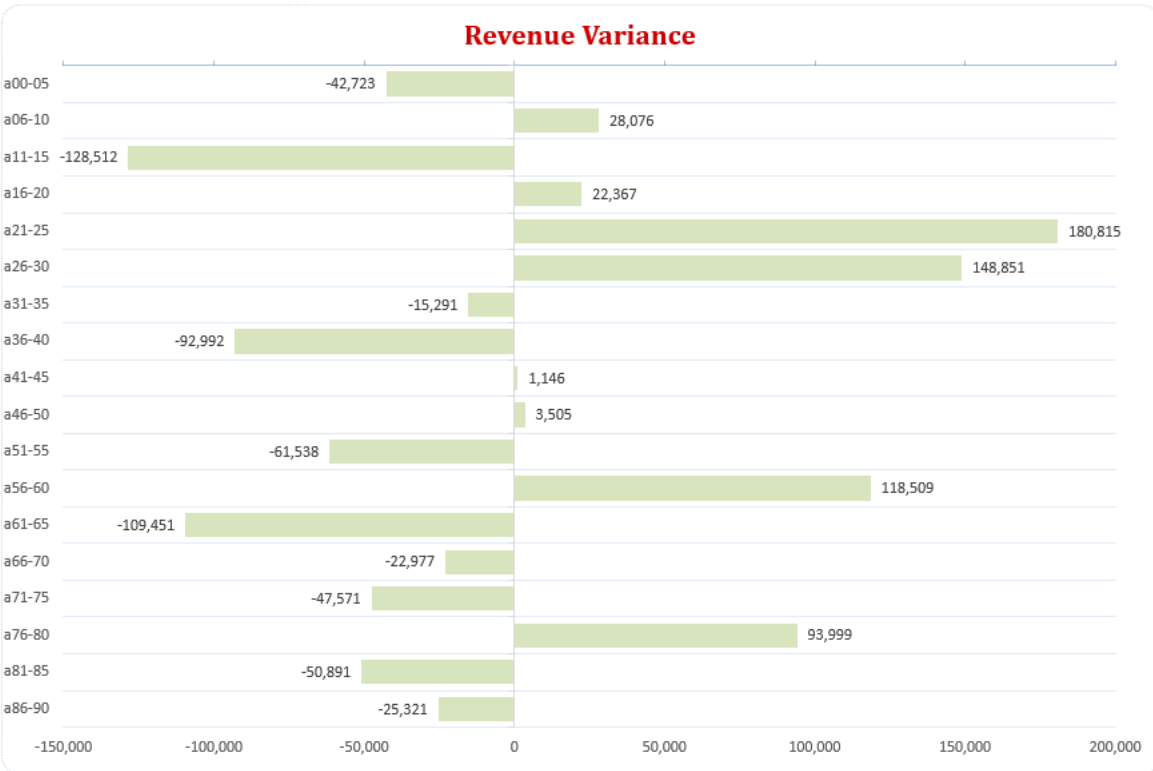
Revenue & Units Variance By Age

Revenue
Units

Year

Month

Category



Yr/Mth	Units	Rev	Var Units	Var Rev	%Var Units	%Var Rev
2016	11,635,679	58,178,394	35,316	-57,825,234	8569.25%	-92915.37%
2017	11,716,081	58,580,405	51,956	-58,060,848	8528.56%	-92935.72%
Grand Total	23,351,760	116,758,799	87,272	-115,886,082	17097.81%	-185851.09%

Year/Cat	Units	Rev	Var Units	Var Rev	%Var Units	%Var Rev
2016	11,635,679	58,178,394	35,316	-57,825,234	8569.25%	-92915.37%
2017	11,716,081	58,580,405	51,956	-58,060,848	8528.56%	-92935.72%
Grand Total	23,351,760	116,758,799	87,272	-115,886,082	17097.81%	-185851.09%

Year/Month	Units	Rev	Var Units	Var Rev	%Var Units	%Var Rev
2016	11,635,679	58,178,394	35,316	-57,825,234	8569.25%	-92915.37%
2017	11,716,081	58,580,405	51,956	-58,060,848	8528.56%	-92935.72%
Grand Total	23,351,760	116,758,799	87,272	-115,886,082	17097.81%	-185851.09%



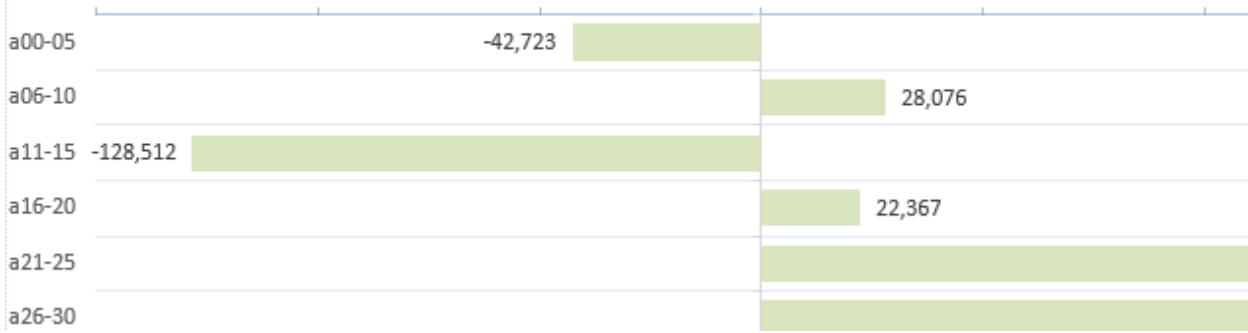
Features of the Drill Down Dashboard

Notice on the drill down dashboard there is a back arrow to go back to the parent dashboard.

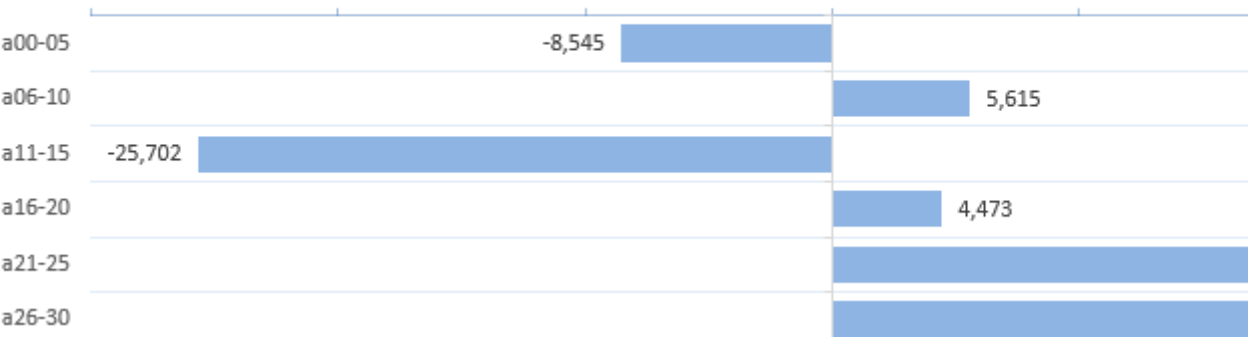


On this level we show units and revenue variances rather than percentages.

Revenue Variance



Units Variance



We also have 3 pivot tables on each of the drill down dashboards

Yr/Mth	Units	Rev	Var Units	Var Rev	%Var Units	%Var Rev
2016						
Jan	973,045	4,865,226	-13,406	-4,999,288	482.36%	-7858.82%
Feb	973,480	4,867,402	53,435	-4,333,054	1620.27%	-7289.87%
Mar	964,838	4,824,191	115,990	-3,664,286	3001.85%	-6599.08%
Apr	962,647	4,813,237	21,110	-4,602,134	729.48%	-7735.26%

Year/Cat	Units	Rev	Var Units	Var Rev	%Var Units	%Var Rev
2016						
CATEGORY-A	1,302,516	6,512,582	-97,252	-7,485,098	-992.32%	-11296.16%
CATEGORY-B	1,305,872	6,529,358	60,387	-5,925,491	2439.90%	-9580.05%
CATEGORY-D	1,289,005	6,445,023	39,283	-6,052,189	1605.41%	-9997.29%
CATEGORY-E	1,278,090	6,390,451	-4,089	-6,431,341	907.53%	-10346.24%

Year/Month	Units	Rev	Var Units	Var Rev	%Var Units	%Var Rev
2016						
Jan						
CATEGORY-A	109,084	545,420	-22,159	-767,007	-303.91%	-1051.95%
CATEGORY-B	108,181	540,905	-28,326	-824,168	-373.51%	-1086.76%
CATEGORY-D	111,316	556,578	14,095	-415,624	260.97%	-769.51%

These tables present Year/Month and all age bands.
Then Year/Category/Age Bands.
And lastly Year/Month/Category/Age Bands.



Features of the Drill Down Dashboard

Here are some examples of the drill down pivot tables.

Yr/Mth	Units	Rev	Var Units	Var Rev	%Var Units	%Var Rev
2016						
Jan	973,045	4,865,226	-13,406	-4,999,288	482.36%	-7858.82%
Feb	973,480	4,867,402	53,435	-4,333,054	1620.27%	-7289.87%
Mar	964,838	4,824,191	115,990	-3,664,286	3001.85%	-6599.08%
Apr	962,647	4,813,237	21,110	-4,602,134	729.48%	-7735.26%
May	978,440	4,892,202	-132,605	-6,218,250	-1702.36%	-8951.18%
Jun	989,750	4,948,749	-56,498	-5,513,729	-77.43%	-8138.72%
Jul	976,416	4,882,080	70,879	-4,173,291	1905.08%	-7147.46%
Aug	968,783	4,843,916	5,737	-4,786,545	966.28%	-7616.86%
Sep	961,263	4,806,317	-29,545	-5,101,769	58.40%	-8070.80%
Oct	952,827	4,764,133	-2,435	-4,788,480	268.84%	-7965.58%
Nov	959,597	4,797,984	-25,763	-5,055,610	49.11%	-8075.45%
Dec	974,591	4,872,957	28,416	-4,588,799	1267.37%	-7466.31%
2017						
Jan	989,001	4,945,004	-38,460	-5,329,608	48.31%	-8075.84%
Feb	989,018	4,945,091	12,797	-4,817,119	503.90%	-7848.05%
Mar	989,320	4,946,599	41,518	-4,531,416	1240.53%	-7479.74%
Apr	965,688	4,828,442	-33,769	-5,166,129	3.84%	-8098.08%
May	952,105	4,760,525	-63,946	-5,399,983	-541.57%	-8370.79%
Jun	982,752	4,913,762	35,291	-4,560,848	1364.82%	-7417.59%
Jul	977,985	4,889,927	9,029	-4,799,641	775.12%	-7712.44%
Aug	974,180	4,870,898	-57,344	-5,444,341	-384.16%	-8292.08%
Sep	979,720	4,898,602	115,865	-3,739,948	3088.55%	-6555.73%
Oct	962,042	4,810,208	78,112	-4,029,084	2133.44%	-7033.28%
Nov	992,663	4,963,314	52,413	-4,439,181	1173.60%	-7513.20%
Dec	961,606	4,808,032	-99,552	-5,803,552	-877.80%	-8538.90%
Grand Total	23,351,760	116,758,799	87,272	-115,886,082	17097.81%	-185851.09%

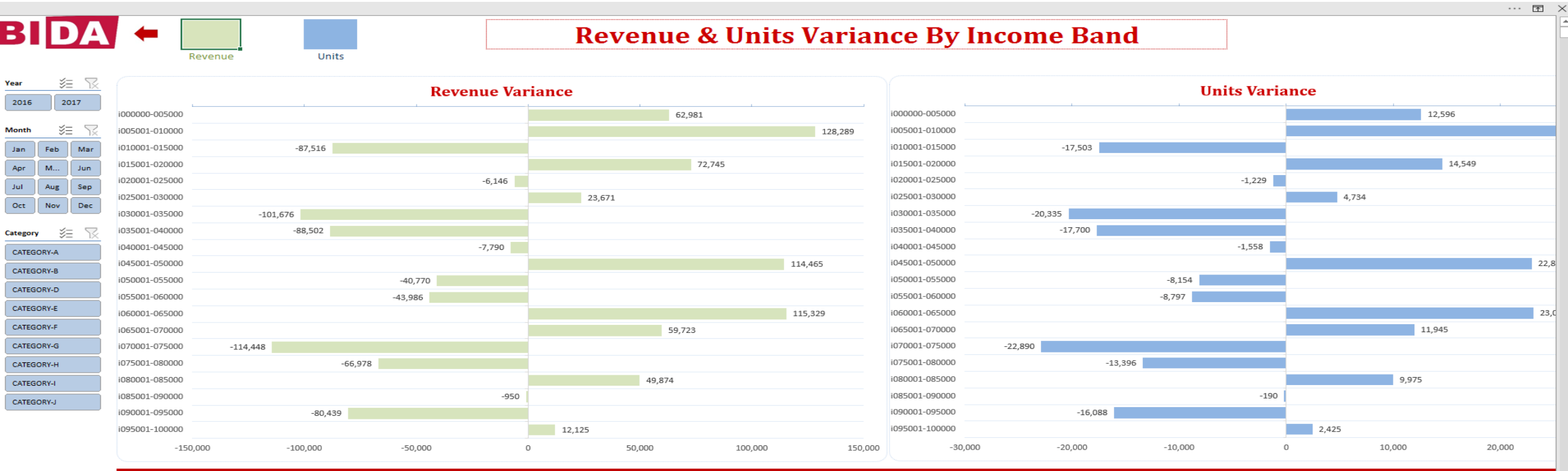
Year/Cat	Units	Rev	Var Units	Var Rev	%Var Units	%Var Rev
2016						
CATEGORY-A	1,302,516	6,512,582	-97,252	-7,485,098	-992.32%	-11296.16%
CATEGORY-B	1,305,872	6,529,358	60,387	-5,925,491	2439.90%	-9580.05%
CATEGORY-D	1,289,005	6,445,023	39,283	-6,052,189	1605.41%	-9997.29%
CATEGORY-E	1,278,090	6,390,451	-4,089	-6,431,341	907.53%	-10346.24%
CATEGORY-F	1,293,421	6,467,106	-599	-6,473,097	693.75%	-10453.12%
CATEGORY-G	1,266,729	6,333,647	14,191	-6,191,734	840.51%	-10379.75%
CATEGORY-H	1,298,786	6,493,931	-115,420	-7,648,132	-1070.18%	-11335.09%
CATEGORY-I	1,296,300	6,481,501	54,375	-5,937,751	1815.93%	-9892.03%
CATEGORY-J	1,304,959	6,524,796	84,440	-5,680,400	2328.73%	-9635.64%
2017	11,716,081	58,580,405	51,956	-58,060,848	8528.56%	-92935.72%
Grand Total	23,351,760	116,758,799	87,272	-115,886,082	17097.81%	-185851.09%

Year/Month	Units	Rev	Var Units	Var Rev	%Var Units	%Var Rev
2016						
Jan						
CATEGORY-A	109,084	545,420	-22,159	-767,007	-303.91%	-1051.95%
CATEGORY-B	108,181	540,905	-28,326	-824,168	-373.51%	-1086.76%
CATEGORY-D	111,316	556,578	14,095	-415,624	260.97%	-769.51%
CATEGORY-E	107,307	536,537	758	-528,961	12.80%	-893.60%
CATEGORY-F	108,115	540,575	-6,004	-600,619	-94.71%	-947.35%
CATEGORY-G	103,810	519,051	-26,417	-783,224	-365.14%	-1082.57%
CATEGORY-H	119,850	599,248	33,932	-259,927	710.89%	-544.56%
CATEGORY-I	99,466	497,329	-13,111	-628,440	-209.63%	-1004.82%
CATEGORY-J	105,917	529,583	33,826	-191,318	844.60%	-477.70%
Feb	973,480	4,867,402	53,435	-4,333,054	1620.27%	-7289.87%
Mar	964,838	4,824,191	115,990	-3,664,286	3001.85%	-6599.08%
Apr	962,647	4,813,237	21,110	-4,602,134	729.48%	-7735.26%



Features of the Dashboard

Just to prove that we have similar drill down dashboards for each of the 6 demographic groups. Here is the example for Income Band.



Yr/Mth	Units	Rev	Var Units	Var Rev	%Var Units	%Var Rev
2016	12,960,153	64,800,764	1,359,790	-51,202,864	35310.70%	-90344.65%
2017	12,990,050	64,950,251	1,325,925	-51,691,001	33768.75%	-91115.62%
Grand Total	25,950,203	129,751,016	2,685,715	-102,893,865	69079.45%	-181460.28%

Year/Cat	Units	Rev	Var Units	Var Rev	%Var Units	%Var Rev
2016	12,960,153	64,800,764	1,359,790	-51,202,864	35310.70%	-90344.65%
2017	12,990,050	64,950,251	1,325,925	-51,691,001	33768.75%	-91115.62%
Grand Total	25,950,203	129,751,016	2,685,715	-102,893,865	69079.45%	-181460.28%

Year/Month	Units	Rev	Var Units	Var Rev	%Var Units	%Var Rev
2016	12,960,153	64,800,764	1,359,790	-51,202,864	35310.70%	-90344.65%
2017	12,990,050	64,950,251	1,325,925	-51,691,001	33768.75%	-91115.62%
Grand Total	25,950,203	129,751,016	2,685,715	-102,893,865	69079.45%	-181460.28%

**Introducing
Meta5 Capsules to
Build Dashboards**



Getting Age Band Data

When building dashboards similar to the one described the usual approach is to put data in to SSAS cubes and let Excel read the data from the cubes. This is a fine solution and tens of thousands of companies have implemented SSAS cubes with Excel front ends.

Using SSAS and Cubes as the back end to Excel Dashboards has a cost profile. Meaning there are certain costs associated with this solution. These costs include significant people costs for development and support of the cubes/dashboards.

We chose Meta5 as an alternative approach to using SSAS because we know that the overall costs of development and support will be significantly lower by using Meta5. It is simply faster, easier and cheaper to build Excel Dashboards using Meta5 than it is using SSAS.

In this section we will show you how and why.

Firstly, let's look at a simple "capsule". The one to get age band data for the dashboard.

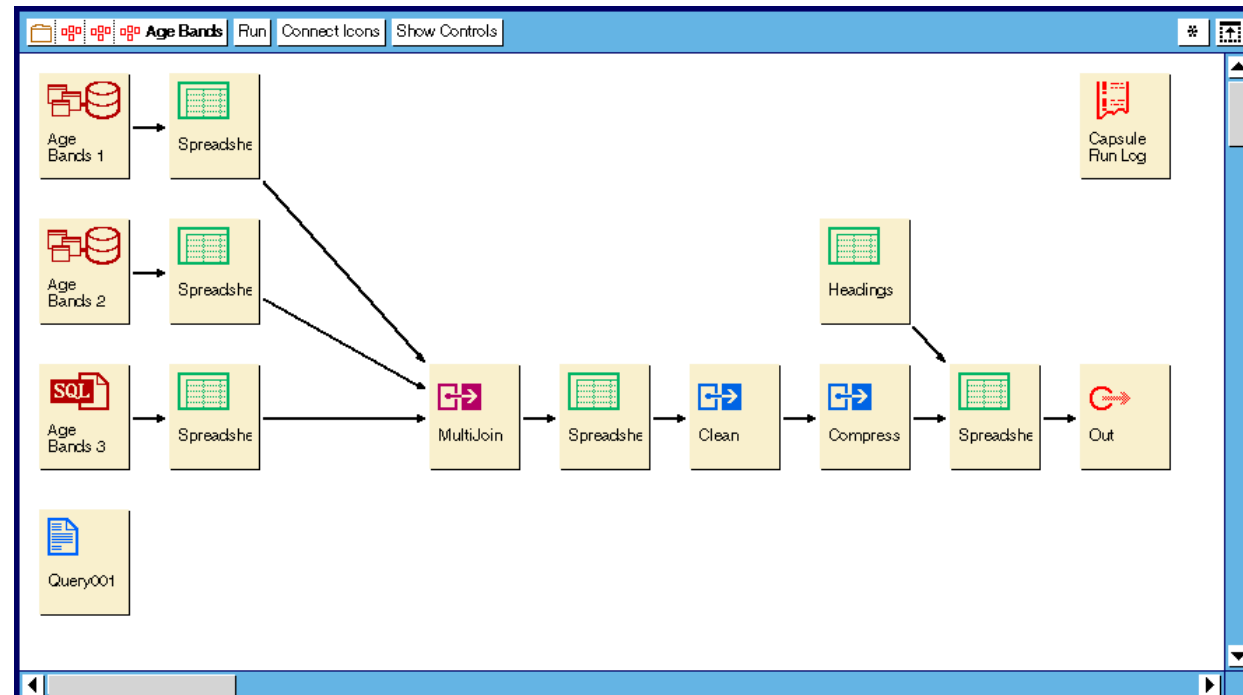
Although the icons are small you can see there are two query icons and an sql entry icon. These are the first three icons on the left. You can also see Query001 which is an sql statement in a text document that will be given to the Age 3 SQL Entry icon at run time to run against the database.

In Meta5 there are a number of tools that generate sql against a data warehouse, or any database that can be read via ODBC. In the event that the sql can not be generated by the tool you can simply write it yourself and put it in a text document and it will be executed during processing.

Next, you can see the data from the three queries will flow in to three spreadsheets. The three sets of data are needed to perform the calculations performed in the spreadsheets.

You then have a "multi-join" which joins the three data streams together just like an SQL join can do. The multi-join sends the data forward to another spreadsheet.

Next...rows that are not needed are discarded in the Clean icon and the heading row from the query icons are removed by the Compress icon.



The Compress icon then sends the data, with no heading row, in to another spreadsheet and another spreadsheet sends in the heading rows that will be used inside Excel. This setting of headings is required because Meta5 has a dictionary and the user names of fields can be altered in that dictionary at any time to make the field names better for users.

If this is done to a field used in a dashboard the link via the field name is broken and the dashboard will no longer work. So these heading names must be created for each set of data that will flow in to an Excel Dashboard and Power Query data model.

Finally, when the data is all ready and prepared to be sent to the Excel data workbook it goes "Out" of this capsule and moves on in its processing.

On the next page we will look inside a query icon so you can get an idea how they work.



Getting Age Band Data

This is what a query in Meta5 looks like. The top line is the output for the query where you can add sort settings and you can ask for unique rows. The data returns to this query icon and can be displayed in the top panel. You can see 3,888 rows were returned by this query.

The Query Control window is where the user of the tool builds the query out of the tables that s/he has available to him/her. This query is a very simple query.

It is retrieving the year, month in year, month name, product category code and description, age band and the sum of revenue and units.

The table names and column names are managed as text in a spreadsheet and then loaded in to the Meta5 dictionary. We do not recommend maintaining these names by hand using the Meta5 DBA tool as maintaining these names in spreadsheets is faster.

The tables you can see in the diagram are obvious. The Sale Date, the Product and the Sale Txn. The fields that link tables are denoted by “←” and the primary key of a table is denoted with →.

Anyone with even a very modest level of understanding of databases can use the query tool. There is another tool called the reporter tool for people who can not use the query tool. The reporter tool has some very nice reporting features that the query tool does not.

This query generates the following sql. We have altered it a little to fit it into the spot on the page. You can clearly see the relationship between the query tool and the sql.

```
select vm_sale_date.year_name, vm_sale_date.month_in_year
, vm_sale_date.month_name, vm_product.prod_cat_code
, vm_product.prod_cat_description, vm_all_demographic.age_band
, sum(vf_sale_txn.sale_extended_amount), sum(vf_sale_txn.sale_units)
from vf_sale_txn, vm_all_demographic, vm_product, vm_sale_date
where
vm_all_demographic.pk_vm_all_demographic=vm_sale_txn.dk_vm_customer_demographic
and vm_product.pk_vm_product=vm_sale_txn.dk_vm_product
and vf_sale_txn.dk_vm_sale_date=vm_sale_date.pk_vm_day
and NOT (vm_all_demographic.age_band = 'NA')
and (vm_product.prod_cat_code < '993')
group by vm_sale_date.year_name, vm_sale_date.month_in_year
, vm_sale_date.month_name , vm_product.prod_cat_code
, vm_product.prod_cat_description, vm_all_demographic.age_band
order by vm_sale_date.year_name, vm_sale_date.month_in_year
, vm_product.prod_cat_code, vm_all_demographic.age_band
```

The screenshot shows the Meta5 Query Control window. At the top, it displays '3,888 items found, ordered by dbo.vm_sale_date.year_name,...'. Below this is a table showing the results of the query:

Year Name	Month In Year	Month Name	Prod Cat Code	Prod Cat Description	Age B
2016	1	January	010	CATEGORY-J	a00-05
2016	1	January	010	CATEGORY-J	a06-10

Below the table is the 'Query Control' window, which shows a 'General Qualifier' field and a diagram of three tables: 'Sale Date-d', 'Sale Txn-f', and 'Product-d'. The diagram shows the relationships between fields in these tables:

- Sale Date-d** (Primary Key: →Date-d)
 - ← Day Date
 - ← Day Name
 - ← Day Name Sdesc
 - ← Day In Week
 - ← Day In Month
 - ← Day In Year
 - ← Week In Month
 - ← Week In Year
 - ← Week Begin Date
 - ← Month Name
 - ← Month Name Sdesc
 - ← Month In Year
 - ← Calendar Qtr
 - ← Calendar Qtr Str
 - ← Month In Qtr
 - ← Week In Qtr
 - ← Day In Qtr
 - ← Financial Qtr
 - ← Financial Year
 - ← Financial Year Name
 - ← Month In Fncl Qtr
 - ← Week In Fncl Qtr
 - ← Day In Fncl Qtr
 - ← Year Name
 - ← Year Num
 - ← Season Name
 - ← Season Name Sdesc
 - ← Num Days Since 1970
 - ← Num Weeks Since 1970
- Sale Txn-f** (Primary Key: →Sale Txn-f)
 - ← Sale Date-d
 - ← Product-d
 - ← Customer-d
 - ← Customer Demographics-d
 - ← Customer Geography-d
 - ← Currency-d
 - ← Sale Txn Type-d
 - ← Sale Txn Status-d
 - ← Unit Of Measure-d
 - ← Sale Minute-d
 - ← Customer Dims Assoc-f
 - ← Sale Unit Amount
 - ← Sale Extended Amount
 - ← Cost Unit Amount
 - ← Cost Extended Amount
 - ← Tax1 Unit Amount
 - ← Tax1 Extended Amount
 - ← Tax2 Unit Amount
 - ← Tax2 Extended Amount
 - ← Discount Unit Amount
 - ← Discount Extended Amount
 - ← Sale Units
 - ← Number Sales
 - ← Sale Sdesc
 - ← Sale Ldsc
 - ← Sale Tstamp
 - ← Sale Txn Returned Flag
 - ← Return Period Expired Flag
 - ← Return Probability Pct
- Product-d** (Primary Key: →Product-d)
 - ← Product Num
 - ← Prod Num 02
 - ← Prod Description
 - ← Prod Search Description
 - ← Prod Description 02
 - ← Prod Long Description
 - ← Prod Base Unit Of Measure
 - ← Prod Global Dimension 1 Code
 - ← Prod Global Dimension 2 Code
 - ← Prod Vendor No
 - ← Prod Vendor Item No
 - ← Prod Vat Bus Posting Gr Price
 - ← Prod Gen Prod Posting Group
 - ← Prod Vat Prod Posting Group
 - ← Prod Inventory Posting Group
 - ← Prod Item Category Code
 - ← Prod Prod Group Code
 - ← Prod Categorization
 - ← Prod Old VAT Prod Posting Group
 - ← Prod Sales Unit Of Measure
 - ← Prod Purch Unit Of Measure
 - ← Prod Unit Cost
 - ← Prod Last Direct Cost
 - ← Prod Item Priority
 - ← Prod Cat Code
 - ← Prod Cat Description
 - ← Prod Cat Def Gen Prod Posting Group
 - ← Prod Cat Def Inventory Posting Group
 - ← Prod Cat Def Tax Group Code



Getting Age Band Data

A good example of where a fragment of SQL is needed is in the text document Query001. In order to calculate the variance from average revenue and units we need to know how many age bands we have returned in each month for each product category.

There is no guarantee that every category is purchased by someone in every age band every month. So we need this piece of sql. Notice the count distinct. This can not be generated easily by the query tool. And we wanted to show you this feature in any case.

```
select vm_sale_date.year_name ,vm_sale_date.month_in_year
,vm_sale_date.month_name ,vm_product.prod_cat_code
,vm_product.prod_cat_description
,count ( distinct vm_all_demographic.age_band ) as Count Age Bands
from vm_sale_date, vm_product ,vf_sale_txn ,vm_all_demographic
where vm_all_demographic.pk_vm_all_demographic=vm_sale_txn.dk_vm_customer_demographic
and vm_product.pk_vm_product=vm_sale_txn.dk_vm_product
and vf_sale_txn.dk_vm_sale_date=vm_sale_date.pk_vm_day
and NOT (vm_all_demographic.age_band = 'NA')
and ( vm_product.prod_cat_code < '900')
group by vm_sale_date.year_name ,vm_sale_date.month_in_year
,vm_sale_date.month_name ,vm_product.prod_cat_code
,vm_product.prod_cat_description
```

Meta5 contains it's own spreadsheet which is a highly functional spreadsheet. It also has the advantage of being completely integrated with the other 150 or so Meta5 tools.

As you can see from the snippet below the data from the three queries are sent in to the left hand side region of the spreadsheet and on the right hand side region of the spreadsheet the following calculations are made:

1. Average units by Age Band. Average Revenue by Age Band.
2. The absolute variance for this age band for both revenue and units.
3. The percentage variance for this age band for both revenue and units.

In this way the data that will be needed in the dashboard is retrieved from the data warehouse, or any source, and joins, calculations etc are performed. Then the rows are sent to a worksheet inside the Excel "data" workbook.

You can prepare data in a very complex fashion and send it to Excel ready to be consumed. Further, all capsules can be parameterized so you could produce one dashboard per consumer of the dashboard. For example if you have 10 regional managers for stores they would get their own customized Excel dashboards just for their stores.

All this and much more is very simple to do in Meta5. And simpler to do means less time and effort lowering ongoing costs.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
1	Year	Month	Month Na	Prod Ca	Prod Cat Descri	Age Band	sale_extenc	sale_units_	sale_extenc	sale_units_	Count	Average Units By Age Band	Average Extended Amount By Age Band	Variance Units	%Variance Units	Variance Revenue	%Variance Revenue
2	2016	1	January	010	CATEGORY-J	a00-05	5,701.48	2,378	719,559.32	286,486	18	=15,915.89	=39,975.52	=-13,537.89	=-85.06 %	=-34,274.04	=-85.74 %
3	2016	1	January	010	CATEGORY-J	a06-10	11,502.69	4,689	719,559.32	286,486	18	=15,915.89	=39,975.52	=-11,226.89	=-70.54 %	=-28,472.83	=-71.23 %
4	2016	1	January	010	CATEGORY-J	a11-15	16,155.14	6,256	719,559.32	286,486	18	=15,915.89	=39,975.52	=-9,659.89	=-60.69 %	=-23,820.38	=-59.59 %
5	2016	1	January	010	CATEGORY-J	a16-20	25,432.17	10,084	719,559.32	286,486	18	=15,915.89	=39,975.52	=-5,831.89	=-36.64 %	=-14,543.35	=-36.38 %



Integrating Many Data Streams

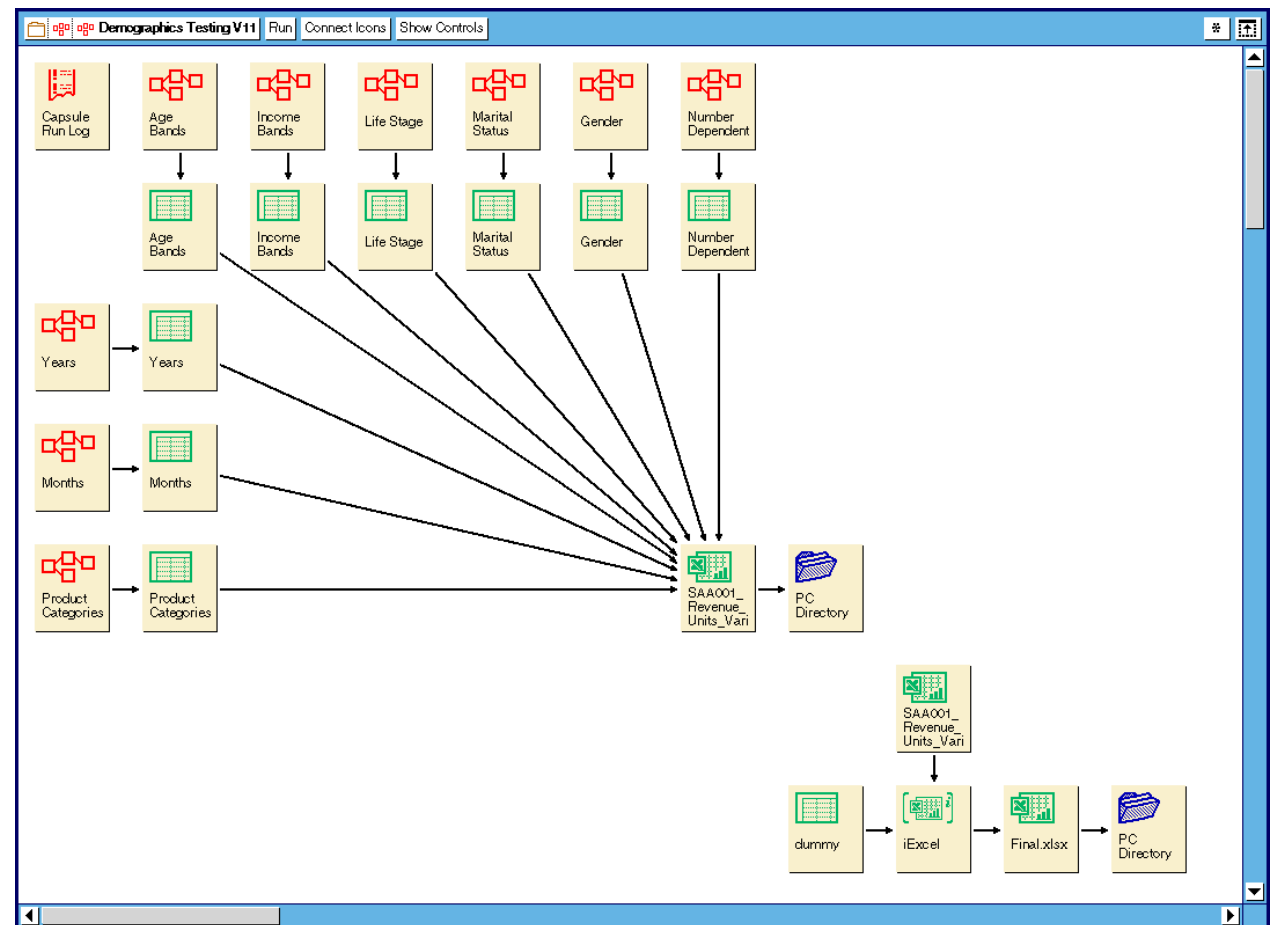
On the previous pages we showed you how Age Band data is collected and processed to generate the data needed to be consumed by Excel for the dashboard. But how are all the other pieces of data prepared and how do they all make it in to Excel?

In the capsule to the right the “Age Band” capsule is what we were just looking at. When the data goes “Out” of the capsule it goes to the Age Bands spreadsheet. From the Age Bands Spreadsheet it goes to a defined name in the SAA001 Excel Spreadsheet towards the bottom right of the capsule. This spreadsheet collects all data that will be used in the Dashboard.

You can see there are 5 other capsules across the top for income, life stage etc. You can see there are three capsules to the left to collect the dimensional data. When the capsule is run all these capsules will run and place the data they collect and process in to the Excel spreadsheet and that spreadsheet will be written to the hard drive of the system that Meta5 is running on.

Here is the Name Manager from the receiving Excel Workbook. You can see the Defined Names in the workbook and you can see their sizes. They expand and contract automatically.

Name	Value	Refers To	Scope
AgeBandData01	{“Year Name”, “Month In Year”, ...	=AgeBandData01!\$A\$1:\$Q\$3889	Workbook
GenderData01	{“year_name”, “month_in_year” ...	=GenderData01!\$A\$1:\$Q\$433	Workbook
IncomeBandData01	{“Year Name”, “Month In Year”, ...	=IncomeBandData01!\$A\$1:\$Q\$4321	Workbook
LifeStageData01	{“Year Name”, “Month In Year”, ...	=LifeStageData01!\$A\$1:\$R\$1945	Workbook
MaritalStatusData01	{“year_name”, “month_in_year” ...	=MaritalStatusData01!\$A\$1:\$Q\$649	Workbook
Months_dim	{“month_in_year”, “month_na...	=Months_dim_s!\$A\$1:\$C\$13	Workbook
NumDependentsData01	{“year_name”, “month_in_year” ...	=NumDependentsData01!\$A\$1:\$Q\$1...	Workbook
ProductCategory_dim	{“prod_cat_code”, “prod_cat_d...	=ProductCategory_dim_s!\$A\$1:\$B\$10	Workbook
Years_dim	{“year_name”; “2016”; “2017”}	=Years_dim_s!\$A\$1:\$A\$3	Workbook

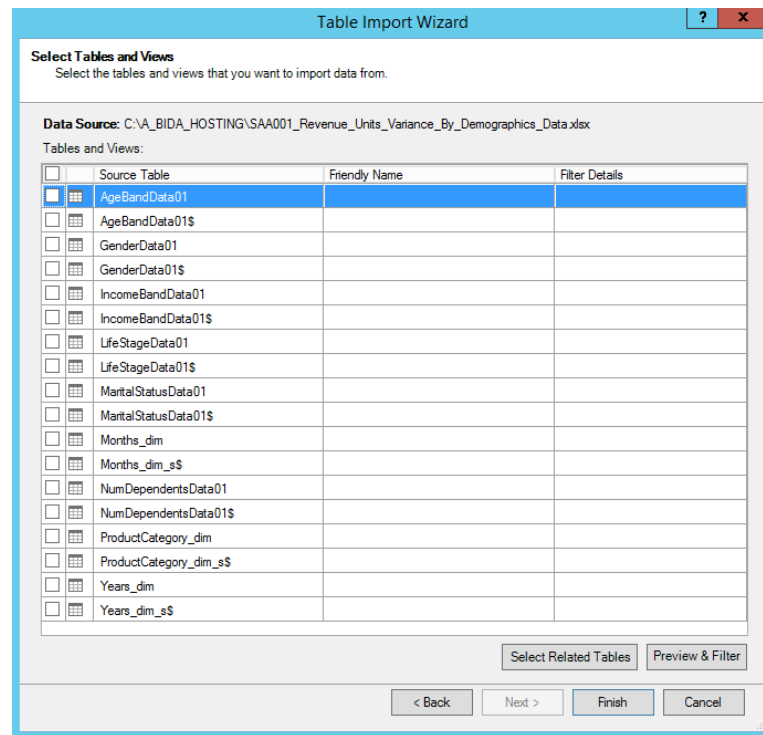


Once the data is delivered to the “data” workbook and this workbook is written to the file system then the connection to the dashboard Excel Workbook is all under Excel control. The icons to the bottom right will cause the Dashboard spreadsheet to be updated as part of ETL processing. The now updated spreadsheet can then be sent to the user as his/her own personalized dashboard. This can be done for thousands of spreadsheets daily. There is no limit to the scalability of this solution. The only limitations you need to be concerned about are those that come with Excel.



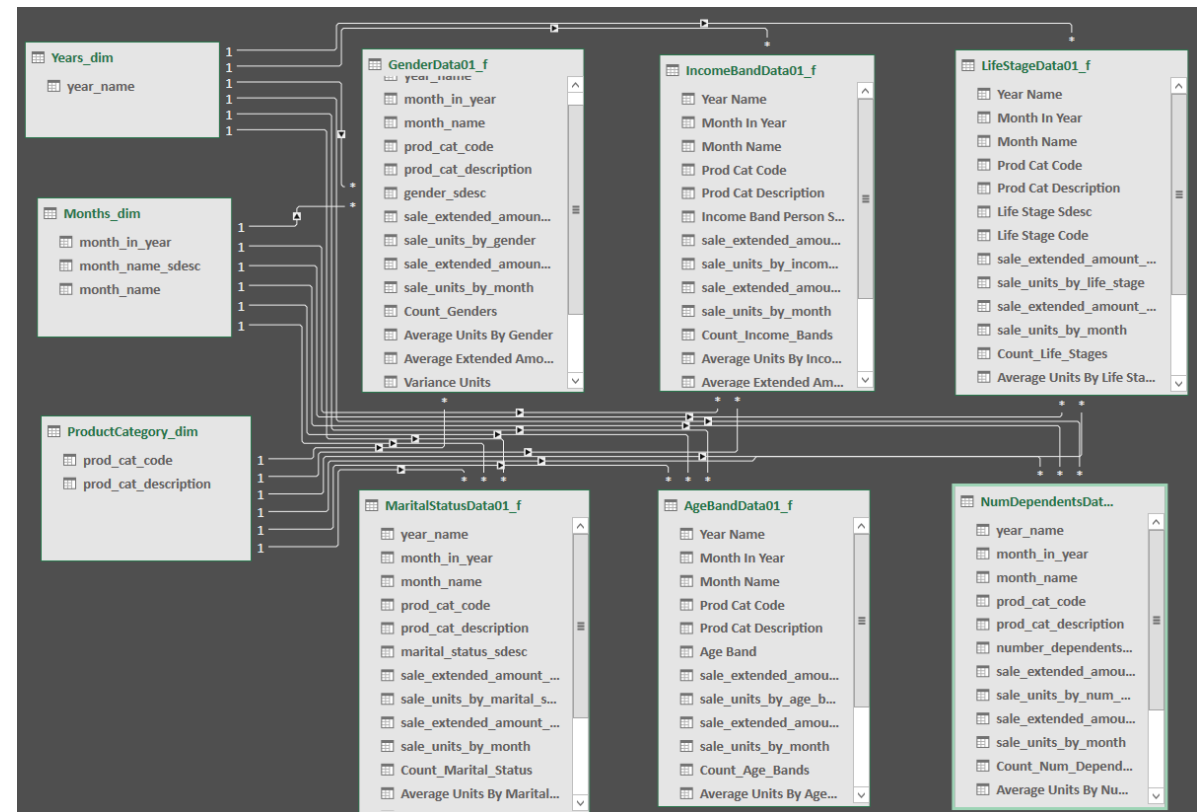
Linking The Data Workbook to Power Query

To link the “data” workbook to the “dashboard” workbook we simply go in to Power Query and run the Table Import Wizard. It will link the data workbook to the dashboard workbook and import the current version of the data for us to get started on building our dashboard.



Of course, we then needed to build our data model in Power Query as shown in the picture to the right. Once we have our data in our Power Query model and we have all the joins set correctly we can use all the functions of Excel to build dashboards using Power Query and Power Pivot.

The slicers are attached to the dimension tables and when clicked on they perform power queries against the data in the “mini fact tables” and update the charts on the dashboards.



As we said at the beginning of this white paper. This approach to building dashboards is faster, cheaper and easier than SSAS cubes. And now you can see why.

Meta5 capsules are created to prepare the data directly from the data warehouse, or other sources, and then Meta5 sends the data directly in to the power query model of the dashboard spreadsheet.

This processing can be automated and run as part of the daily ETL stream. So the end user gets his/her customized dashboards that contain just the data he/she wants sent to the location of his/her choice. For example a shared folder, a one drive, or even directly to his/her PC or tablet.

Summary On BIDA Excel Dashboards



Summary of Our BIDA Navision Dashboards

As our previous white papers have described we are working to develop a BI Solution for Microsofts Navision 2009 ERP System. We have been working with Navision for 4 years and we are familiar with how Navision works. We will support later releases once we have a good installed base.

We propose to bring to market a BI Solution that has the lowest possible cost profile for the best possible results to our customers. In order deliver a “low cost” and “high value” BI solution we had to make a number of technology choices.

We chose to use our own BIDA ETL and data models because of the very significant cost savings they provide. Our BIDA ETL has a far lower total cost profile than Microsofts Informatica or SSIS.

When choosing front end tools it was harder. As much as we like Report Services, Power BI and other non Microsoft front ends, Excel is by far the most used and most familiar data analysis product that users of Navision use on a daily basis.

To choose any other product than Excel would mean we would have to persuade users who use Excel every day to use “something else” for our product. It’s just easier to use Excel.

This left us with the question of using SSAS or Meta5. We are familiar with the strengths and weaknesses of each product. SSAS is a fine product that is in use in tens of thousands of companies. The Navision BI products that are our competitors use SSAS.

We are very familiar with the cost profile of using SSAS. The SSAS cost profile is quite a significant portion of the overall cost of supporting an end to end BI solution for Navision.

After much consideration we chose to go with Meta5 for the tool that will populate Excel reports and dashboards over SSAS.

The two main reasons for doing this are:

1. Meta5 gives users much greater analytical capability for higher value to the business.
2. Meta5 significantly reduces the costs of development and support for Excel based reporting.

The purpose of this white paper is to introduce you to the idea of using Meta5 as the tool to populate Excel reports and dashboards as an alternative to SSAS.

To do that we showed you a typical Dashboard of the style we will be developing. This one is the Demographics Analysis Dashboard. The user experience of this dashboard is very simple and very normal. It is simply showing the Revenue and Units Variance of the demographic sub-group to the overall group.

In a “normal” Excel BI Solution SSAS would have been used to hold cubes that summarized data along the demographic attributes and Excel would have been linked to that cube.

In our solution the SSAS Cube is replaced with a Meta5 Capsule that will retrieve the data from the underlying data warehouse, process that data, and deliver it to an Excel Data Workbook. This Excel Data Workbook will then serve as the source data for the Excel Dashboard (or reporting) Workbook which will read the data in to Excel Power Query.

Using Meta5 it is simply easier to develop and support such applications as “Capsules” rather than support the development and maintenance of SSAS Cubes.

Another very important difference is the ability to parameterize a “capsule” and produce one workbook per user where the data in the workbook is customized for each user.

For example, if you have 10 region managers for your stores and they only want the demographic analysis for their stores? You can parameterize this capsule and it will run 10 times and send 10 workbooks to the 10 region managers, each one containing just the data for his/her stores. The data is embedded in the workbook inside the Power Query model.

Of course, Meta5 can read data from any ODBC source, and many other sources, and you can build Excel Reports / Dashboards for any source of data you have today. We just happen to be using Meta5 for our Navision BI Solution.

If you like what you have seen in this white paper and you would like to test out how to build Excel Dashboard using Meta5? Please give us a call. We would be happy to show you a more detailed demonstration of exactly how this works. Thank you for your time!

Thank You

For Your Time!