Using Aggregates and Combining Data Sources in OBIEE

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hroug
20. godišnja konferencija

Rovinj, 14.10.2015

Leading Innovation in Business Analytics

About Qubix

Leading Innovation in Business Analytics

About me

- 20+ Years in IT

- 10 years working for Oracle, 4 years CIO

- MSc. in Economy, BSc. in IT

- Senior Consultant for Business Intelligence solutions

- Major work area today is Business Intelligence, currently investigating BI Cloud Services, and focusing in Data Science and Machine Learning

Qubix

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Qubix @ HROUG 2015

Šta	Tko	Gdje	Kada
Korištenje agregata i kombiniranje izvora podataka u Oracle BI	Žiga Vaupot	Dv 5 Apartmani	srijeda, 14. listopad 2015., 09:00
Priprema i implementacija Karte pogleda u Oracle BI	Žiga Vaupot	Dv 5 Apartmani	srijeda, 14. listopad 2015., 10:00
Planiranje i budžetiranje Cloud usluge!	Andrew Mason	Dv 4 Mali klub	srijeda, 14. listopad 2015., 15:00
Sklad Oracle Cloud za EPM i BI su: Baxters recepti za uspjeh	Andrew Mason	Dv 5 Apartmani	četvrtak, 15. listopad 2015., 12:30

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Aggregate Fact Tables or Cubes

- *Aggregate fact tables* are simple numeric rollups of atomic fact table data built solely to accelerate query performance. These aggregate fact tables should be available to the BI layer at the same time as the atomic fact tables so that **BI tools smoothly choose the appropriate aggregate level at query time**. This process, known as *aggregate navigation*, must be *open* so that every report writer, query tool, and BI application harvests the same performance benefits. A properly designed set of aggregates should behave like database indexes, which accelerate query performance but are not encountered directly by the BI applications or business users. **Aggregate fact tables contain foreign keys to shrunken conformed dimensions, as well as aggregated facts created by summing measures from more atomic fact tables**. Finally, ***aggregate OLAP cubes* with summarized measures** **are frequently built in the same way as relational aggregates**, but the OLAP cubes are meant to be accessed directly by the business users.

Source:
http://www.kimballgroup.com/data-warehouse-business-intelligence-resources/kimball-techniques/dimensional-modeling-techniques/aggregate-fact-table-cube/

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Agenda

- Aggregates in OBIEE

- Simplify Aggregates Management with Aggregate Persistence Wizard

- Vertical Federation – Drill from Multi-Dimensional to Relational

- … live demo between the lines

Agenda

- **Aggregates in OBIEE**

- Simplify Aggregates Management with Aggregate Persistence Wizard

- Vertical Federation – Drill from Multi-Dimensional to Relational

- **… live demo between the lines**

Data schema to start with
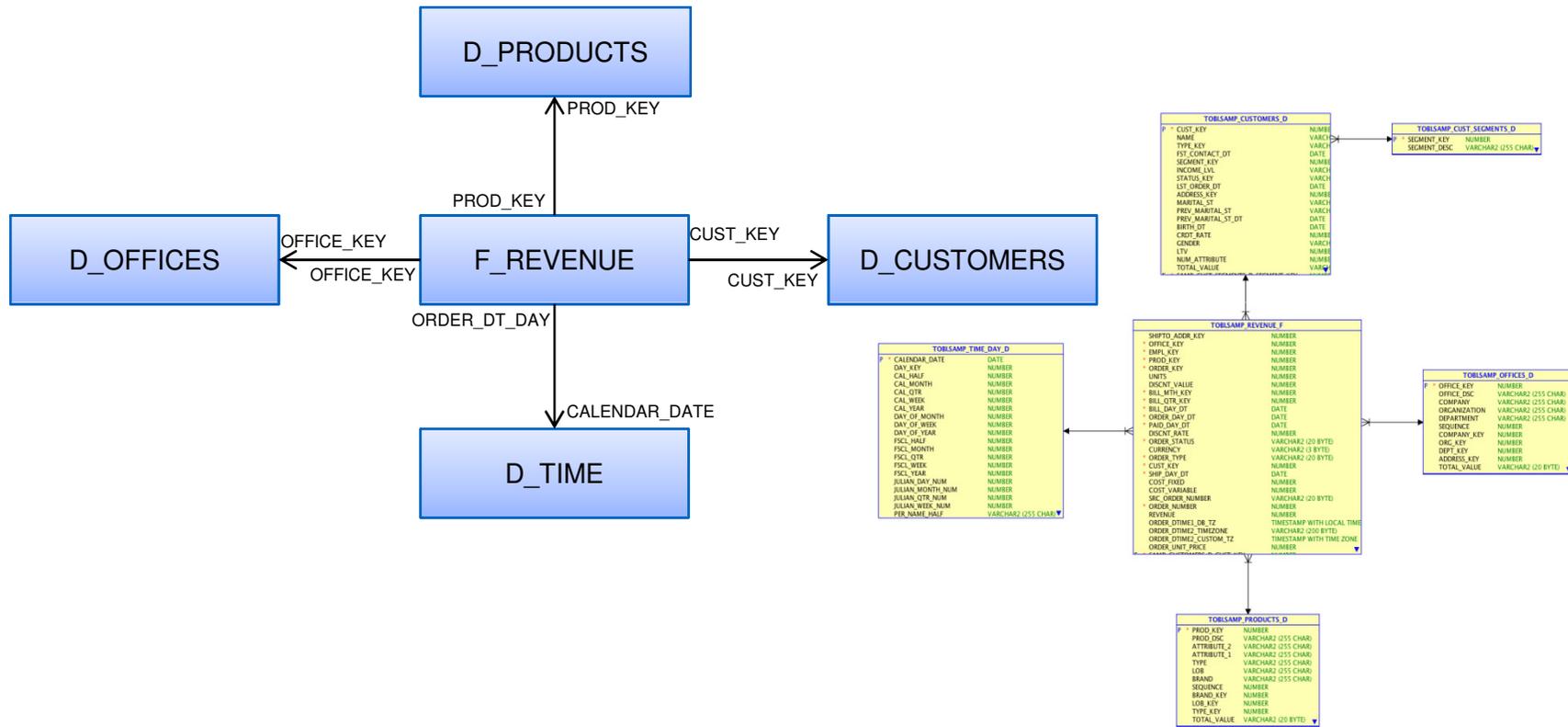
Let's check RPD as well – Physical Layer

Business Model

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Let's now create a simple query

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SQL generated

```
WITH SAWITH0 AS (select sum(T4535.UNITS) as c1,
        sum(T4535.REVENUE) as c2,
        T4488.SEGMENT_DESC as c3,
        T4510.DEPARTMENT as c4,
        T4522.BRAND as c5,
        T4563.PER_NAME_YEAR as c6,
        T4510.DEPT_KEY as c7,
        T4522.BRAND_KEY as c8,
        T4488.SEGMENT_KEY as c9
From SAMP_TIME_DAY_D T4563 /* D_Time */ ,
        SAMP_PRODUCTS_D T4522 /* D_Products */ ,
        SAMP_OFFICES_D T4510 /* D_Offices */ ,
        SAMP_CUST_SEGMENTS_D T4488 /* D_Customer_segments */ ,
        SAMP_CUSTOMERS_D T4491 /* D_Customers */ ,
        SAMP_REVENUE_F T4535 /* F_Revenue */
where ( T4488.SEGMENT_KEY = T4491.SEGMENT_KEY and T4491.CUST_KEY = T4535.CUST_KEY
and T4510.OFFICE_KEY = T4535.OFFICE_KEY
and T4522.PROD_KEY = T4535.PROD_KEY
and T4535.ORDER_DAY_DT = T4563.CALENDAR_DATE )
group by T4488.SEGMENT_DESC, T4488.SEGMENT_KEY, T4510.DEPARTMENT, T4510.DEPT_KEY,
T4522.BRAND, T4522.BRAND_KEY, T4563.PER_NAME_YEAR)
select …
```

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Bring in Aggregates
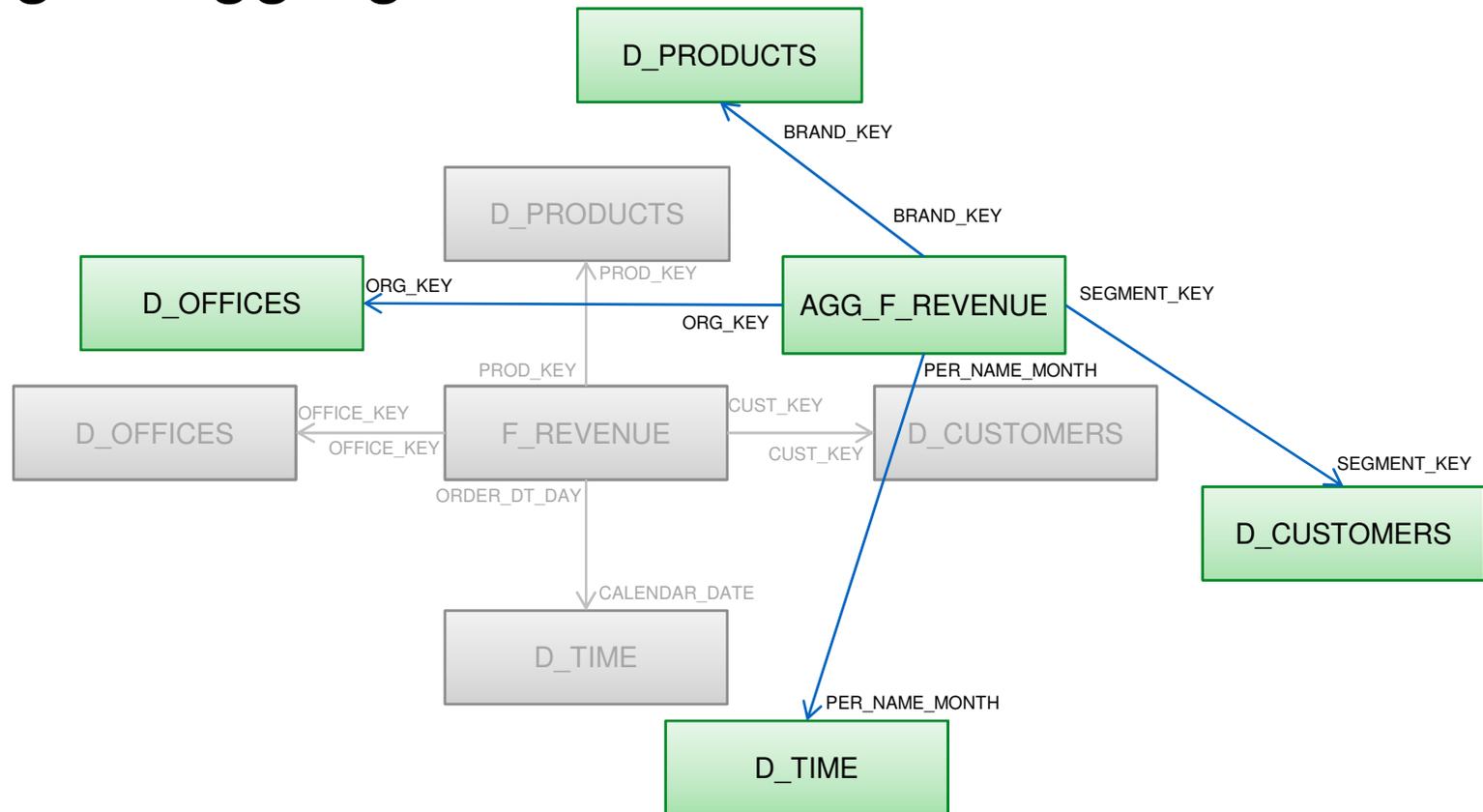
Create Aggregates

```
create table samp_revenue_f_agg as
select p.brand_key, s.segment_key, o.org_key,
t.per_name_month, sum(f.revenue) revenue, sum(f.units)
units, sum(f.cost_fixed) cost_fixed,
sum(f.cost_variable) cost_variable,
count(f.ORDER_NUMBER) orders
from samp_revenue_f f, samp_products_d p,
samp_customers_d c, samp_cust_segments_d s,
samp_offices_d, samp_time_day_d t
where p.prod_key = f.prod_key
and s.segment_key = c.segment_key
and c.cust_key = f.cust_key
and o.office_key = f.office_key
and t.calendar_date = f.order_day_dt
group by p.brand_key, s.segment_key, o.org_key,
t.per_name_month
order by p.brand_key, s.segment_key, o.org_key,
t.per_name_month;
```

```
create table samp_time_day_d_agg as
select distinct d.per_name_month, d.per_name_qtr, d.per_name_half,
d.per_name_year
from SAMP_TIME_DAY_D d
group by d.per_name_month, d.per_name_qtr, d.per_name_half,
d.per_name_year
order by 4,3,2,1;

create table samp_products_d_agg as
select distinct p.brand, p.brand_key
from SAMP_PRODUCTS_D p
group by p.brand, p.brand_key
order by p.brand, p.brand_key;

create table samp_customers_d_agg as
select distinct s.segment_key, s.segment_desc
from samp_cust_segments_d s
order by s.SEGMENT_KEY,s.SEGMENT_DESC;

create table samp_offices_d_agg as
select distinct o.organization, o.org_key, o.company, o.company_key
from SAMP_OFFICES_D o
group by o.organization, o.org_key, o.company, o.company_key
order by o.organization, o.org_key, o.company, o.company_key;
```

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Import AGG tables into RPD

Bring Base and AGG tables together

Bring Base and AGG tables together

Create a new simple table and test the aggregates

Selected Columns

Double click on column names in the Subject Areas pane to add them to the analysis. Once added, drag-and-drop columns to r

Dim Customers	Dim Offices	Dim Products	Dim Time	Fact Sales	
Customer Segment	Organization	Brand	Year	Sales Revenue	Units Sold

Customer Segment	Organization	Brand	Year	Sales Revenue	Units Sold
Active Singles	Franchises Org.	BizTech	2009	6,135	640
			2010	260,110	24,053
			2011	244,497	20,699
			2012	262,760	21,548
		FunPod	2009	3,129	259
			2010	218,581	17,301
			2011	259,301	18,691
			2012	262,076	19,341
		HomeView	2009	3,171	306
			2010	228,522	20,862
			2011	235,851	18,186
			2012	187,867	13,905
	Inbound Org.	BizTech	2009	6,736	661
			2010	448,882	43,448
			2011	514,007	43,288
			2012	452,865	37,248
		FunPod	2009	6,921	512
			2010	355,974	28,733
			2011	349,460	24,866
			2012	398,007	30,702
		HomeView	2009	5,761	704
			2010	443,140	41,016
			2011	369,992	29,350
			2012	359,044	24,708
	International Org.	BizTech	2009	4,398	443

Rows 1 - 25

```
WITH SAWITH0 AS (select sum(T5346.UNITS) as c1,
sum(T5346.REVENUE) as c2,      T5337.SEGMENT_DESC as c3,
T5340.ORGANIZATION as c4,      T5343.BRAND as c5,
T5355.PER_NAME_YEAR as c6,      T5337.SEGMENT_KEY as c7,
T5340.ORG_KEY as c8,      T5343.BRAND_KEY as c9from
SAMP_TIME_DAY_D_AGG T5355 /* D_Time_AGG */ ,
SAMP_PRODUCTS_D_AGG T5343 /* D_Products_AGG */ ,
SAMP_OFFICES_D_AGG T5340 /* D_Offices_AGG */ ,
SAMP_CUSTOMERS_D_AGG T5337 /* D_Customers_AGG */ ,
SAMP_REVENUE_F_AGG T5346 /* F_Revenue_AGG */ where   (
T5337.SEGMENT_KEY = T5346.SEGMENT_KEY and T5340.ORG_KEY =
T5346.ORG_KEY and T5343.BRAND_KEY = T5346.BRAND_KEY and
T5346.PER_NAME_MONTH = T5355.PER_NAME_MONTH ) group by
T5337.SEGMENT_DESC, T5337.SEGMENT_KEY,
T5340.ORGANIZATION, T5340.ORG_KEY, T5343.BRAND,
T5343.BRAND_KEY, T5355.PER_NAME_YEAR) …
```

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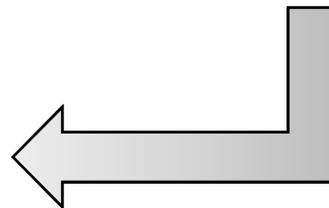
What happens if you drill down?

Customer Segment	Organization	Brand	Year	Sales Revenue	Units Sold
Active Singles	Franchises Org.	BizTech	2009	6,135	640
			2010	260,110	24,053
			2011	244,497	20,699
			2012	262,760	21,548
		FunPod	2009	3,129	259
			2010	218,581	17,301
		HomeView	2009	3,171	306
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			2012	359,044	24,708
	International Org.	BizTech	2009	4,398	443

⇧ ⇧ ⇩ ⇵ Rows 1 - 25

Customer Segment	Organization	Department	Brand	Year	Sales Revenue	Units Sold
Active Singles	Franchises Org.	Operations Dept.	BizTech	2009	3,282	300
				2010	166,857	15,033
				2011	157,048	13,132
				2012	180,825	14,802
			FunPod	2009	1,934	149
				2010	141,740	10,720
	Inbound Org.					

```
WITH SAWITH0 AS (select sum(T4535.UNITS) as c1,
sum(T4535.REVENUE) as c2,      T4488.SEGMENT_DESC as c3,
T4510.DEPARTMENT as c4,      T4510.ORGANIZATION as c5,
T4522.BRAND as c6,      T4563.PER_NAME_YEAR as c7,
T4488.SEGMENT_KEY as c8,      T4510.DEPT_KEY as c9,
T4522.BRAND_KEY as c10
from      SAMP_TIME_DAY_D T4563 /* D_Time */ ,
SAMP_PRODUCTS_D T4522 /* D_Products */ ,
SAMP_OFFICES_D T4510 /* D_Offices */ ,
SAMP_CUST_SEGMENTS_D T4488 /* D_Customer_segments */ ,
SAMP_CUSTOMERS_D T4491 /* D_Customers */ ,
SAMP_REVENUE_F T4535 /* F_Revenue */ where  (
T4488.SEGMENT_KEY = T4491.SEGMENT_KEY and T4491.CUST_KEY
= T4535.CUST_KEY and T4510.OFFICE_KEY = T4535.OFFICE_KEY
and T4522.PROD_KEY = T4535.PROD_KEY and
T4535.ORDER_DAY_DT = T4563.CALENDAR_DATE ) group by
T4488.SEGMENT_DESC, T4488.SEGMENT_KEY, T4510.DEPARTMENT,
T4510.DEPT_KEY, T4510.ORGANIZATION, T4510.ORG_KEY,
T4522.BRAND, T4522.BRAND_KEY, T4563.PER_NAME_YEAR),
```

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Agenda

- Aggregates in OBIEE

- **Simplify Aggregates Management with Aggregate Persistence Wizard**

- Vertical Federation – Drill from Multi-Dimensional to Relational

- **… live demo between the lines**

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Aggregate Persistence Wizard (1)
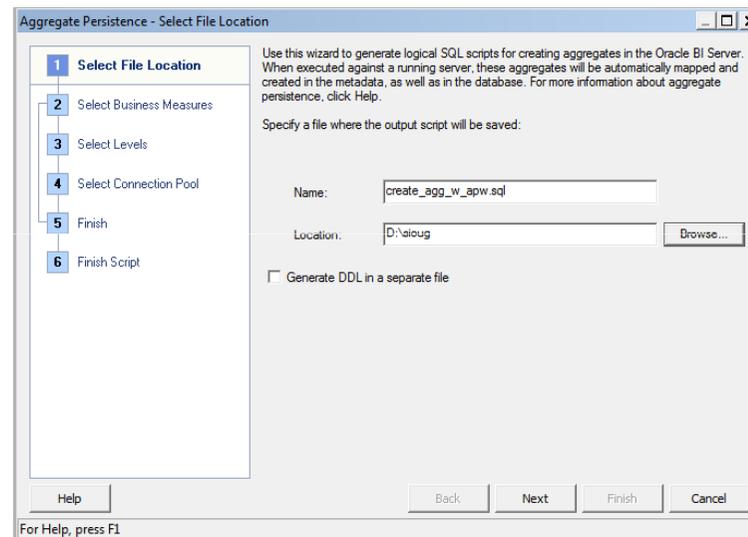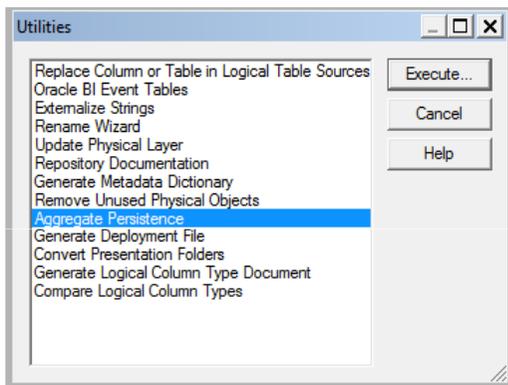
Aggregate Persistence Wizard (2)
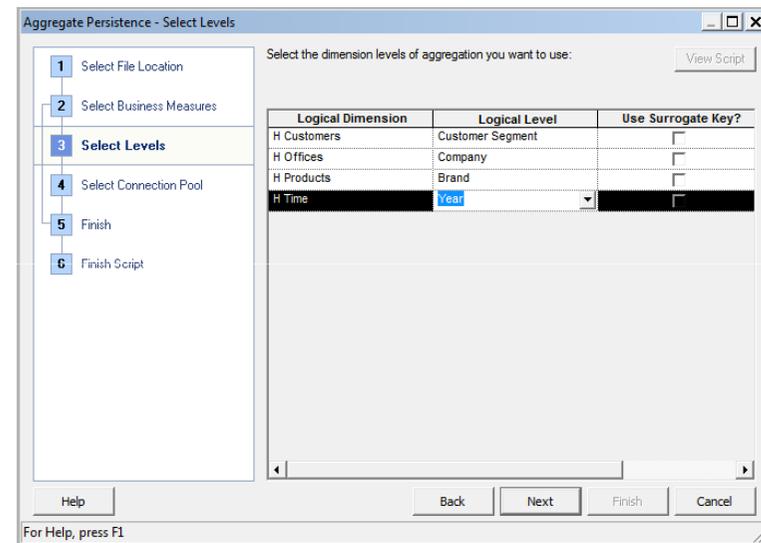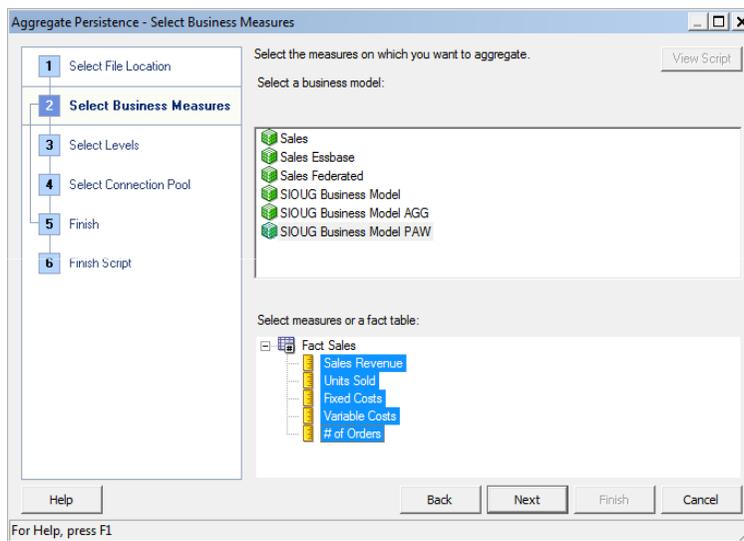
Aggregate Persistence Wizard (3)
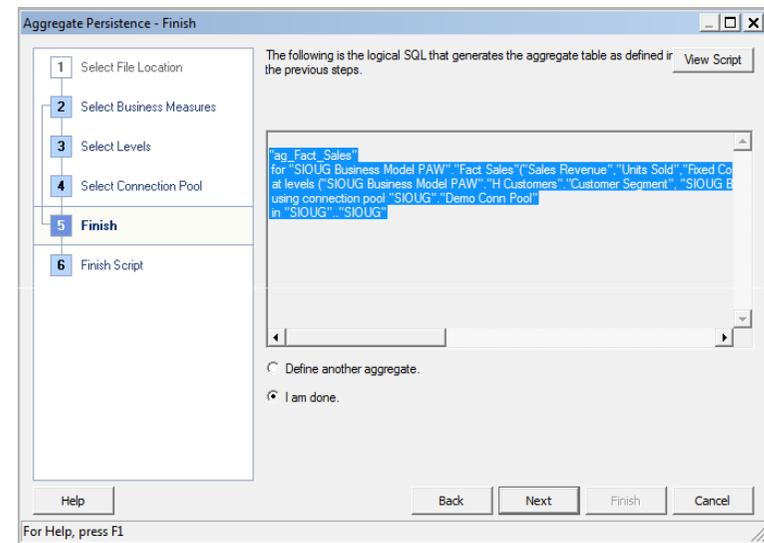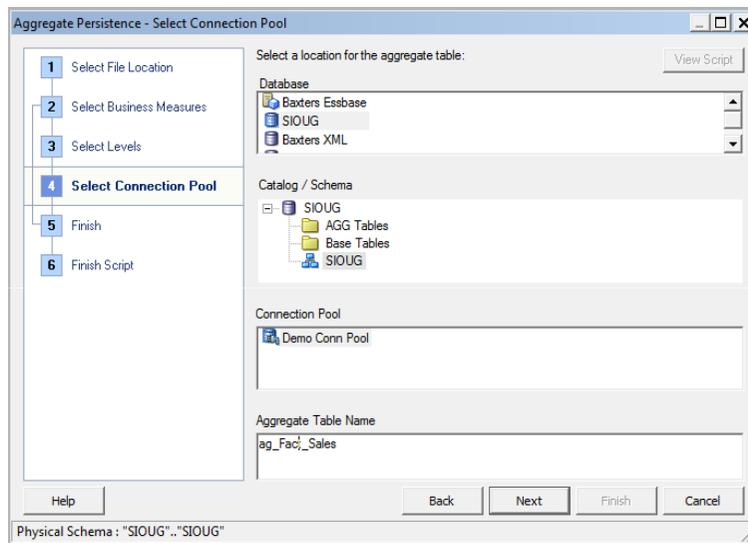
View the generated script
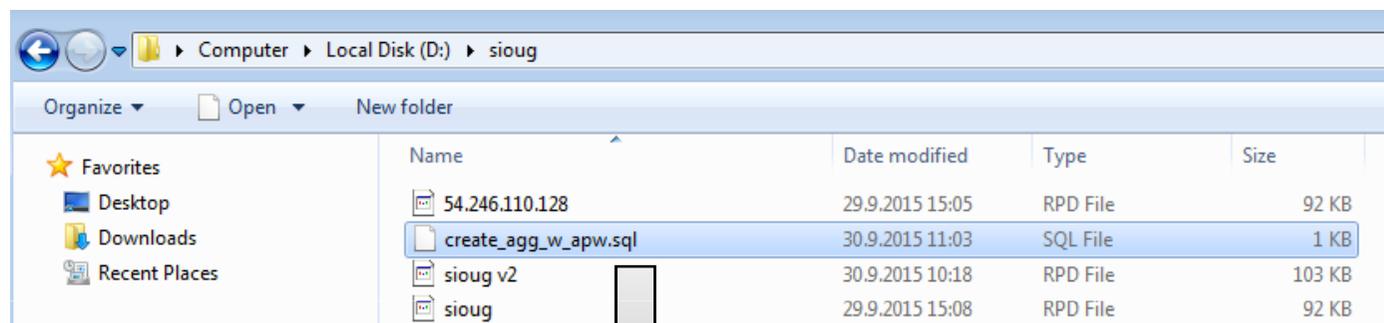

```
create aggregates

"ag_Fact_Sales" for "SIOUG Business Model PAW"."Fact Sales"("Sales Revenue","Units Sold","Fixed
Costs","Variable Costs","# of Orders") at levels ("SIOUG Business Model PAW"."H Customers"."Customer
Segment", "SIOUG Business Model PAW"."H Offices"."Company", "SIOUG Business Model PAW"."H
Products"."Brand", "SIOUG Business Model PAW"."H Time"."Year") using connection pool "SIOUG"."Demo Conn
Pool" in "SIOUG".."SIOUG";
```

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Run it using NQCMD

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Run it using NQCMD (1)

- Go to folder where NQCMD is located


```
C:\>cd D:\Program Files\Oracle Business Intelligence Enterprise Edition Plus Cli
ent Tools\oraclebi\orahome\bifoundation\server\bin

C:\>d:

D:\Program Files\Oracle Business Intelligence Enterprise Edition Plus Client Too
ls\oraclebi\orahome\bifoundation\server\bin>dir nqcmd.*
 Volume in drive D has no label.
 Volume Serial Number is 1E2F-5942

 Directory of D:\Program Files\Oracle Business Intelligence Enterprise Edition P
lus Client Tools\oraclebi\orahome\bifoundation\server\bin

24.02.2015  16:21            28.672 nqcmd.exe
               1 File(s)         28.672 bytes
               0 Dir(s)  12.297.543.680 bytes free

D:\Program Files\Oracle Business Intelligence Enterprise Edition Plus Client Too
ls\oraclebi\orahome\bifoundation\server\bin>
```

Run it using NQCMD (2)

```
nqcmd -d training_obiee -u weblogic -p Admin123 -s d:\sioug\create_agg_w_apw.sql -utf16
```

Now, let's check what has happened!

- There should be changes in:

  - database where new tables should be created

  - RPD where all required objects should be created in both, physical and business, layers/models

New tables

SIOUG
  Tables (Filtered)
    AG_FACT_SALES
    SA_BRAND000015EF
    SA_COMPANY000015EA
    SA_CUSTOME000015E5
    SA_YEAR000015F6
    SAMP_CUST_SEGMENTS_D
    SAMP_CUSTOMERS_D
    SAMP_CUSTOMERS_D_AGG
    SAMP_OFFICES_D
    SAMP_OFFICES_D_AGG
    SAMP_PRODUCTS_D
    SAMP_PRODUCTS_D_AGG
    SAMP_REVENUE_F
    SAMP_REVENUE_F_AGG
    SAMP_TIME_DAY_D
    SAMP_TIME_DAY_D_AGG
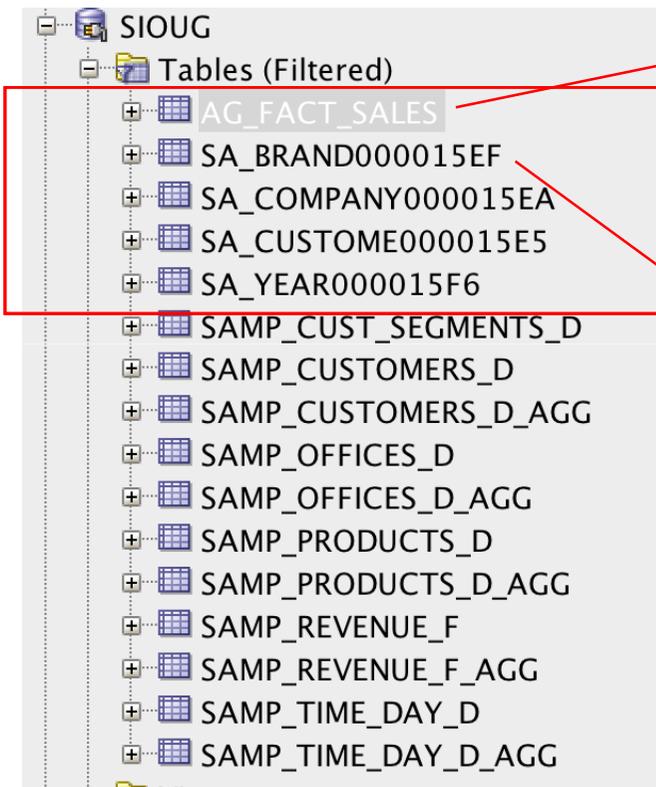
	COLUMN_NAME	DATA_TYPE	NULLABLE	DATA_DEFAULT	COLUMN_ID	COMMENTS
1	CUSTOMER_S000015B4	NUMBER	Yes	(null)	1	(null)
2	COMPANY_ID000015B7	NUMBER	Yes	(null)	2	(null)
3	BRAND_ID000015C0	NUMBER	Yes	(null)	3	(null)
4	YEAR000015C8	VARCHAR2(255 BYTE)	Yes	(null)	4	(null)
5	SALES_REVE000015CF	NUMBER	Yes	(null)	5	(null)
6	UNITS_SOLD000015D0	NUMBER	Yes	(null)	6	(null)
7	FIXED_COST000015D1	NUMBER	Yes	(null)	7	(null)
8	VARIABLE_C000015D2	NUMBER	Yes	(null)	8	(null)
9	Z_OF_ORDER000015D3	NUMBER	Yes	(null)	9	(null)

	COLUMN_NAME	DATA_TYPE	NULLABLE	DATA_DEFAULT	COLUMN_ID	COMMENTS
1	BRAND_000015EFSK	NUMBER	Yes	(null)	1	(null)
2	ALL_AW_LEVEL_KEY	NUMBER	Yes	(null)	2	(null)
3	BRAND000015BF	VARCHAR2(255 CHAR)	Yes	(null)	3	(null)
4	BRAND_ID000015C0	NUMBER	Yes	(null)	4	(null)

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New objects in physical layer of RPD

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New objects in business model of RPD

Ok. Everything what is needed is created. But what about refreshing data?

- **Navigate to log folder**

Location: /app/oracle/biee/instances/instance1/diagnostics/logs/OracleBIServerComponent/coreapplication_obis1
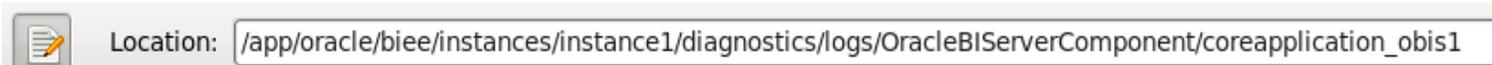
- **Search for "BEGIN: Create Aggregates"**

```
[2015-09-30T05:26:04.000-04:00] [OracleBIServerComponent] [TRACE:5] [USER-40] [] [ecid: 0058FE53RugFw000jzwkno0002KR00001n,0] [tid: 70497700]
[requestid: fffe0002] [sessionid: fffe0000] [username: weblogic] ------------------- Aggregate Manager: *******BEGIN: Create Aggregates******* |[[
```

- **Find log entry where data is appended to fact table ag_Fact_Sales …**

```
SET VARIABLE DISABLE_CACHE_HIT=1, DISABLE_CACHE_SEED=1, DISABLE_SUMMARY_STATS_LOGGING=1, INACTIVE_SCHEMAS='': populate "ag_Fact_Sales" mode ( create
table  connection pool "SIOUG"."Demo Conn Pool") as  select business_model "SIOUG Business Model PAW"."Dim Customers"."Customer Segment ID" as
"Customer_S000015B4","SIOUG Business Model PAW"."Dim Offices"."Company ID" as "Company_ID000015B7","SIOUG Business Model PAW"."Dim Products"."Brand
ID" as "Brand_ID000015C0","SIOUG Business Model PAW"."Dim Time"."Year" as "Year000015C8","SIOUG Business Model PAW"."Fact Sales"."Sales Revenue" as
"Sales_Reve000015CF","SIOUG Business Model PAW"."Fact Sales"."Units Sold" as "Units_Sold000015D0","SIOUG Business Model PAW"."Fact Sales"."Fixed
Costs" as "Fixed_Cost000015D1","SIOUG Business Model PAW"."Fact Sales"."Variable Costs" as "Variable_C000015D2","SIOUG Business Model PAW"."Fact
Sales"."# of Orders" as "Z_of_Order000015D3" from "SIOUG Business Model PAW";
```

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If you take that part of log and modify it a bit, then you can use it in ETL process

```
SET VARIABLE DISABLE_CACHE_HIT=1, DISABLE_CACHE_SEED=1, DISABLE_SUMMARY_STATS_LOGGING=1,
INACTIVE_SCHEMAS='': populate "ag_Fact_Sales" mode ( append table  connection pool "SIOUG"."Demo
Conn Pool") as  select_business_model "SIOUG Business Model PAW"."Dim Customers"."Customer Segment
ID" as "Customer_S000015B4","SIOUG Business Model PAW"."Dim Offices"."Company ID" as
"Company_ID000015B7","SIOUG Business Model PAW"."Dim Products"."Brand ID" as
"Brand_ID000015C0","SIOUG Business Model PAW"."Dim Time"."Year" as "Year000015C8","SIOUG Business
Model PAW"."Fact Sales"."Sales Revenue" as "Sales_Reve000015CF","SIOUG Business Model PAW"."Fact
Sales"."Units Sold" as "Units_Sold000015D0","SIOUG Business Model PAW"."Fact Sales"."Fixed Costs"
as "Fixed_Cost000015D1","SIOUG Business Model PAW"."Fact Sales"."Variable Costs" as
"Variable_C000015D2","SIOUG Business Model PAW"."Fact Sales"."# of Orders" as "Z_of_Order000015D3"
from "SIOUG Business Model PAW"
Where "SIOUG Business Model PAW"."Dim Time"."Year" = '2015';
```

- This is just example which you need of course adopt to your requirements, but that's the idea how you could setup incremental refresh.

- Of course, you would need to use some scheduler etc., but guess what, OBIEE has one too – Job Manager.

Let's test again


```
WITH SAWITH0 AS (select distinct T5907.Units_Sold000015D0
as c1,      T5907.Sales_Reve000015CF as c2,
T5876.Customer_S000015B3 as c3,      T5883.Company000015B6
as c4,      T5890.Brand000015BF as c5,
T5897.Year000015C8 as c6,      T5876.Customer_S000015B4 as
c7,      T5883.Company_ID000015B7 as c8,
T5890.Brand_ID000015C0 as c9
from      SA_Year000015F6 T5897,
     SA_Brand000015EF T5890,
     SA_Company000015EA T5883,
     SA_Custome000015E5 T5876
,      ag_Fact_Sales T5907
where  ( T5883.Company_ID000015B7 =
T5907.Company_ID000015B7 and T5876.Customer_S000015B4 =
T5907.Customer_S000015B4 and T5890.Brand_ID000015C0 =
T5907.Brand_ID000015C0 and T5897.Year000015C8 =
T5907.Year000015C8 ) ),
```
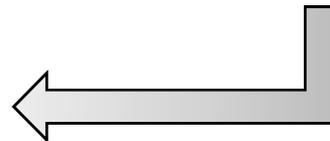
Continue with drill down …

Customer Segment	Company	Brand	Year	Sales Revenue	Units Sold
Active Singles	Genmind Corp	BizTech	2009	6,27	
			2010	506,71	
			2011	468,13	
			2012	505,95	
		FunPod	2009	4,88	
			2010	4,17	
		HomeView	2009	97	
			2010	447,23	
			2011	427,71	
			2012	376,52	
	Stockplus Inc.	BizTech	2009	11,13	
			2010	756,42	
			2011	798,91	
			2012	781,78	
		FunPod	2009	13,08	
			2010	589,83	
			2011	591,65	
			2012	643,92	
		HomeView	2009	7,50	
			2010	712,81	
			2011	600,29	
			2012	614,79	
	Tescare Ltd.	BizTech	2009	12,29	

Rows 1 - 25

Customer Segment	Company	Organization	Brand	Year	Sales Revenue	Units Sold
Active Singles	Genmind Corp	Production Org.	BizTech	2009	4,380	468
				2010	306,704	29,577
				2011	281,040	24,361
			FunPod			
			HomeView			
		Subcontracted Org.	BizTech			
			FunPod			
			HomeView			
	Stockplus Inc.	Inbound Org.	BizTech			

Rows 1 - 25

```
WITH SAWITH0 AS (select sum(T5346.UNITS) as c1,
sum(T5346.REVENUE) as c2,     T5337.SEGMENT_DESC as c3,
T5340.COMPANY as c4,     T5340.ORGANIZATION as c5,
T5343.BRAND as c6,     T5355.PER_NAME_YEAR as c7,
T5337.SEGMENT_KEY as c8,     T5340.ORG_KEY as c9,
T5343.BRAND_KEY as c10
from     SAMP_TIME_DAY_D_AGG T5355 /* D_Time_AGG */ ,
SAMP_PRODUCTS_D_AGG T5343 /* D_Products_AGG */ ,
SAMP_OFFICES_D_AGG T5340 /* D_Offices_AGG */ ,
SAMP_CUSTOMERS_D_AGG T5337 /* D_Customers_AGG */ ,
SAMP_REVENUE_F_AGG T5346 /* F_Revenue_AGG */ where  (
T5337.SEGMENT_KEY = T5346.SEGMENT_KEY and T5340.ORG_KEY =
T5346.ORG_KEY and T5343.BRAND_KEY = T5346.BRAND_KEY and
T5346.PER_NAME_MONTH = T5355.PER_NAME_MONTH ) group by
T5337.SEGMENT_DESC, T5337.SEGMENT_KEY,
T5340.ORGANIZATION, T5340.ORG_KEY, T5340.COMPANY,
T5340.COMPANY_KEY, T5343.BRAND, T5343.BRAND_KEY,
T5355.PER_NAME_YEAR),
```

ORACLE Platinum Partner   … and we already know what happens if you drill down further .   Leading Innovation in Business Analytics

Agenda

- Aggregates in OBIEE

- Simplify Aggregates Management with Aggregate Persistence Wizard

- **Vertical Federation – Drill from Multi-Dimensional to Relational**

- … live demo between the lines

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First findings

- The way how you bring Essbase into RPD is a bit different than in case of relational database

- Once you import it you could "almost instantly" start using it!

- When combining Essbase with other data sources, you should treat it as any other data source, like aggregates for example.

- The bottom line: Essbase is just another database!

And since it is just another database you can simply include it into your business model

New logical data source is automatically added.

Simply drag'n'drop physical onto logical columns
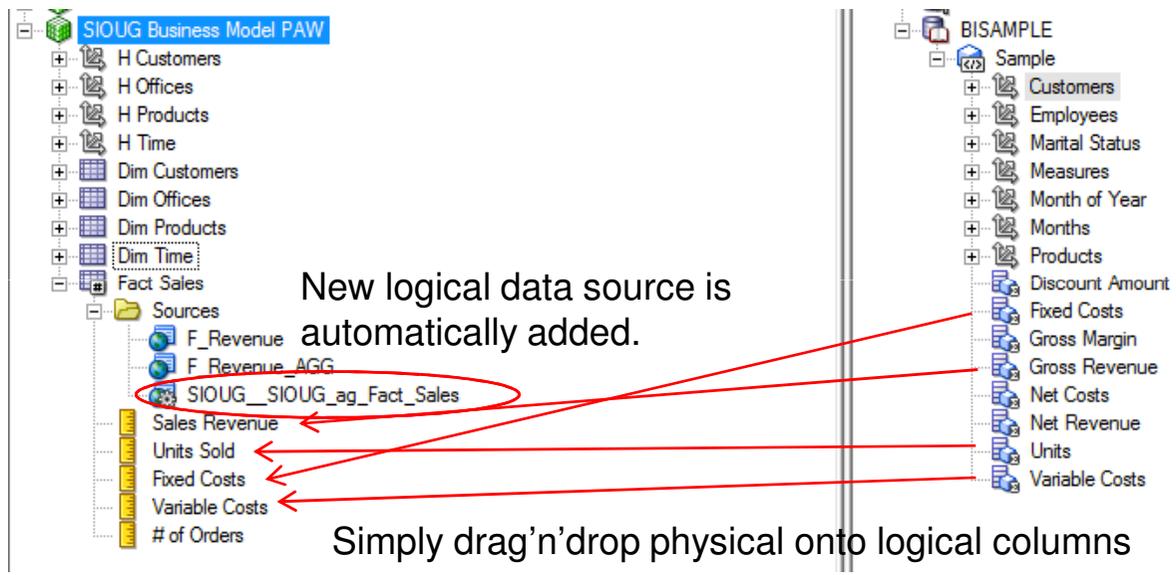
Repeat this for all dimensions …

… for example for Dim Customers dimension
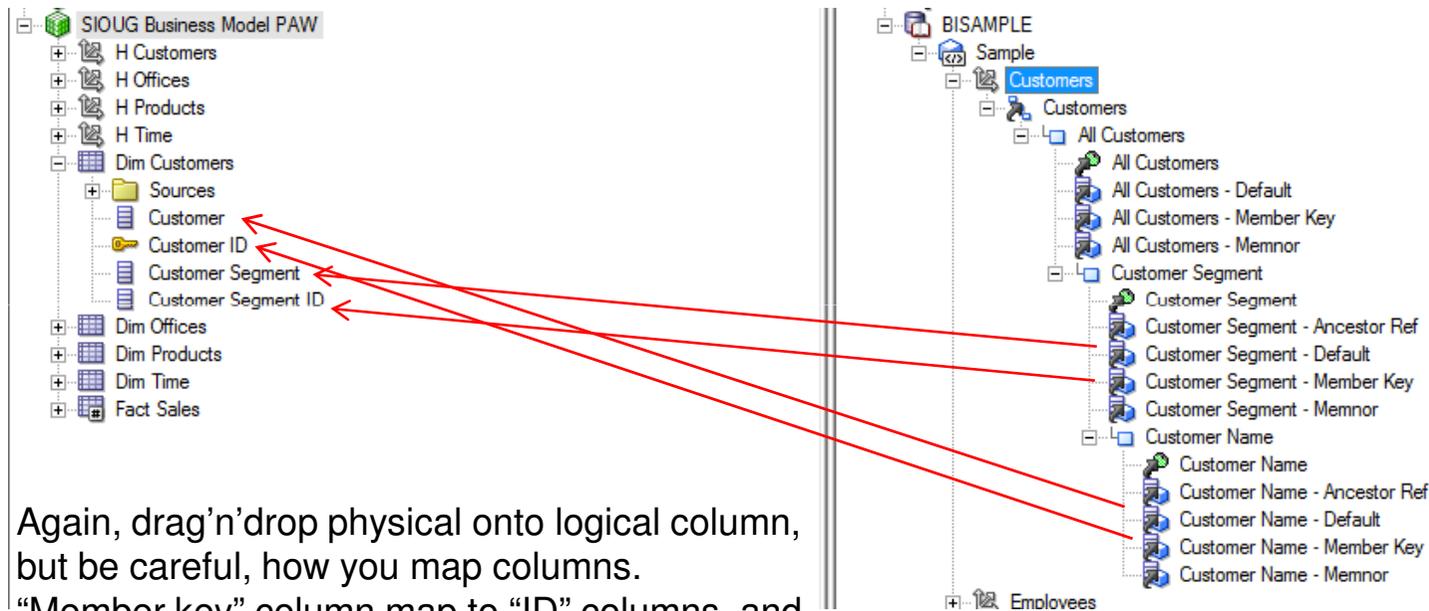
Again, drag'n'drop physical onto logical column, but be careful, how you map columns.
"Member key" column map to "ID" columns, and "Default" columns map to "description" columns in Business Model.
You should also pay attention to the hierarchy in physical cube.

And let's test again
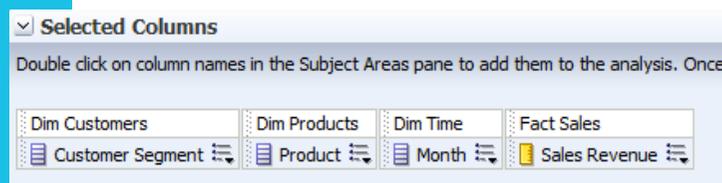
Customer Segment	Product	Month	Sales Revenue
Active Singles	7 Megapixel Digital Camera	2010 / 01	9,771
		2010 / 02	13,873
		2010 / 03	12,431
		2010 / 04	15,915
		2010 / 05	28,330
		2010 / 06	32,043
		2010 / 07	35,338
		2010 / 08	26,555
		2010 / 09	21,508
		2010 / 10	28,249
		2010 / 11	14,877
		2010 / 12	11,202
		2011 / 01	12,485
		2011 / 02	11,421
		2011 / 03	15,016
		2011 / 04	16,179
		2011 / 05	21,716
		2011 / 06	43,951

Selected Columns

Double click on column names in the Subject Areas pane to add them to the analysis. Once

Dim Customers	Dim Products	Dim Time	Fact Sales
Customer Segment	Product	Month	Sales Revenue

```
With
  set [_Months5]  as 'Generate([Months].Generations(2).members, Descendants([Months].currentmember,
[Months].Generations(6), leaves))'
  set [_Customers2]  as '[Customers].Generations(2).members'
  set [_Products5]  as 'Generate([Products].Generations(2).members, Descendants([Products].currentmember,
[Products].Generations(5), leaves))'
select
  { [Measures].[Gross Revenue]  } on columns,
  NON EMPTY {crossjoin({[_Months5]},crossjoin({[_Customers2]},{[_Products5]}))} properties MEMBER_NAME,
GEN_NUMBER, [Customers].[Default], [Customers].[MEMBER_UNIQUE_NAME], [Months].[Default],
[Products].[Default], [Products].[MEMBER_UNIQUE_NAME] on rows from [BISAMPLE.Sample]
```

Just a second. A MDX query!

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And if I drill on a month?

Customer Segment	Product	Month	Sales Revenue
Active Singles	7 Megapixel Digital Camera	2010 / 01	9,771
		2010 / 02	13,873
		2010 / 03	12,431
		2010 / 04	
		2010 / 05	
		2010	
		2010 / 08	
		2010 / 09	
		2010 / 10	
		2010 / 11	
		2010 / 12	11,202
		2011 / 01	12,485
		2011 / 02	11,421
		2011 / 03	15,016
		2011 / 04	16,179
		2011 / 05	21,716
		2011 / 06	43,951
		2011 / 07	32,525
		2011 / 08	24,650
		2011 / 09	26,909
		2011 / 10	19,821
		2011 / 11	16,555
		2011 / 12	13,037
		2012 / 01	10,946

Rows 1 - 25

Customer Segment	Product	Month	Week	Sales Revenue
Active Singles	7 Megapixel Digital Camera	2010 / 01	2010 Week 01	866
			2010 Week 02	2,799
			2010 Week 03	4,844
			2010 Week 04	2,423
			2010 Week 05	779

```
WITH SAWITH0 AS (select sum(T4535.REVENUE) as c1,
T4488.SEGMENT_DESC as c2,     T4522.PROD_DSC as c3,
T4563.PER_NAME_MONTH as c4,      T4563.PER_NAME_WEEK as
c5,      T4488.SEGMENT_KEY as c6,      T4522.PROD_KEY as c7
from       SAMP_TIME_DAY_D T4563 /* D_Time */ ,
SAMP_PRODUCTS_D T4522 /* D_Products */ ,
SAMP_CUST_SEGMENTS_D T4488 /* D_Customer_segments */ ,
SAMP_CUSTOMERS_D T4491 /* D_Customers */ ,
SAMP_REVENUE_F T4535 /* F_Revenue */
where …
```

Well, no surprises there. Right?

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That's all Folks!

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