



# sqlbi

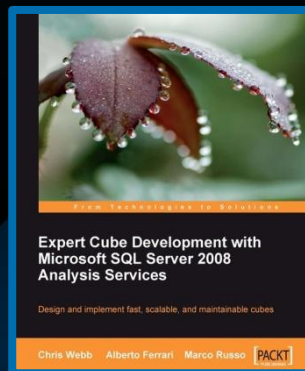
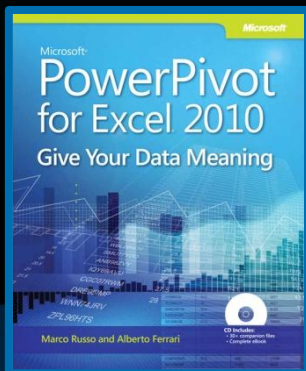
sqlbi.com

# PowerPivot Advanced Data modeling

presented by  
Alberto Ferrari

# Who's Speaking?

- BI Experts and Consultants
- Problem Solving
- Complex Project Assistance
- DataWarehouse Assessments and Development
- Courses, Trainings and Workshops
- Microsoft Business Intelligence Partners
- Book Writers



# Our latest conferences

- PASS Europe 2009 – Neuss – Germany
- PASS 2009 – Seattle – USA
- SQL Conference 2010 – Milan – Italy
- Teched 2010 – New Orleans – USA
- 24 Hours of PASS 2010 – Online
- PASS 2010 – Seattle – USA
- BI Conference 2011 – Lisbon - Portugal

# Agenda

- PowerPivot Data Models:
  - Recap of evaluation contexts
  - Non additive measures (Current account balance)
  - Banding (Discretization)
  - Simulations (Courier Simulations)
  - Many to Many Relationships (Audience)
  - Parent / Child hierarchies

RECAP OF EVALUATION CONTEXTS

# Filter and Row Contexts

# What is a Row Context?

TotalAmount = SUMX (  
Orders,  
Orders[Price] \* Orders[Amount])

- Row Context

- Required to evaluate an expression
- Implicit for calculated columns
- Explicit for iteration functions
- Does not follow relationships

# What is a filter context?

Column Labels <input type="button" value="v"/>									
2001			2002		2003		2004		
Row Labels <input type="button" value="v"/>	Sum of SalesAmount	Perc	Sum of SalesAmount	Perc	Sum of SalesAmount	Perc	Sum of SalesAmount	Perc	
Australia	1,309,047.20	40.08%	2,154,284.88	32.99%	3,033,784.21	30.99%	2,563,884.29	26.24%	
Canada	140,022.01	4.50%	621,602.38	9.52%	535,784.46	5.47%	673,628.21	6.89%	
France	180,571.69	5.53%	514,942.01	7.89%	1,026,324.97	10.48%	922,179.04	9.44%	
Germany	237,784.99	7.28%	521,230.85	7.98%	1,058,405.73	10.81%	1,076,890.77	11.02%	
United Kingdom	291,590.52	8.93%	591,586.85	9.06%	1,298,248.57	13.26%	1,210,286.27	12.39%	
United States	1,100,549.45	33.69%	2,126,696.55	32.57%	2,838,512.36	28.99%	3,324,031.16	34.02%	
Grand Total	3,266,373.66	100.00%	6,530,343.53	100.00%	9,791,060.30	100.00%	9,770,899.74	100.00%	

(Australia, 2001)

During cell evaluation, the database is filtered with the filter context. Rows outside it are not considered.



# Filter Context and Ratios

Column Labels <input type="button" value="v"/>									
2001		2002		2003		2004			
Row Labels <input type="button" value="v"/>	Sum of SalesAmount	Perc	Sum of SalesAmount	Perc	Sum of SalesAmount	Perc	Sum of SalesAmount	Perc	
Australia	1,309,047.20	40.08%	2,154,284.88	32.99%	3,033,784.21	30.99%	2,563,884.29	26.24%	
Canada	146,829.81	4.50%	621,602.38	9.52%	535,784.46	5.47%	673,628.21	6.89%	
France	180,571.69	5.53%	514,942.01	7.89%	1,026,324.97	10.48%	922,179.04	9.44%	
Germany	237,784.99	7.28%	521,230.85	7.98%	1,058,405.73	10.81%	1,076,890.77	11.02%	
United Kingdom	291,590.52	8.93%	591,586.85	9.06%	1,298,248.57	13.26%	1,210,286.27	12.39%	
United States	1,100,549.45	33.69%	2,126,696.55	32.57%	2,838,512.36	28.99%	3,324,031.16	34.02%	
<b>Grand Total</b>	<b>3,266,373.66</b>	<b>100.00%</b>	<b>6,530,343.53</b>	<b>100.00%</b>	<b>9,791,060.30</b>	<b>100.00%</b>	<b>9,770,899.74</b>	<b>100.00%</b>	

$$\frac{\text{(Australia, 2001)}}{\text{(2001)}}$$

Ratio = divide the «part» over the «whole»

The filter context hides the «whole»...

# ALL and CALCULATE

- CALCULATE to manage filter context
  - New context which remove constraints on country
  - Same formula, different filter contexts

```
Perc = SUM(FactInternetSales[SalesAmount])  
/  
CALCULATE (  
    SUM (FactInternetSales[SalesAmount]),  
    ALL (DimSalesTerritory[SalesTerritoryCountry])  
)
```

A SMALL EXAMPLE OF HOW TO AGGREGATE DATA IN DAX

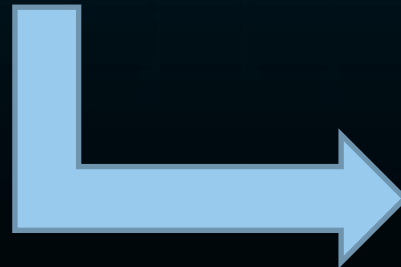
# Semi Additive Measures

# Semi Additive Measures

- Additive Measure
  - SUM over all dimensions
- Non Additive Measure
  - Different function over all dimensions
  - Example: average of the sale price
- Semi Additive Measure
  - SUM over some dimensions
  - Different function over other dimensions
  - Time is the standard exception for aggregations
  - Examples
    - Warehouse stocking
    - Current account balance

# Current Account Balance

Name	Occupation	Country	Date	Quarter	Balance
Katie Jordan	Farmer	USA	1/1/2010	Q1/2010	1,687.50
Luis Bonifaz	IT Consultant	Argentina	1/1/2010	Q1/2010	1,470.00
Maurizio Macagno	IT Consultant	Italy	1/1/2010	Q1/2010	1,500.00
Katie Jordan	Farmer	USA	2/1/2010	Q1/2010	2,812.50
Luis Bonifaz	IT Consultant	Argentina	2/1/2010	Q1/2010	2,450.00
Maurizio Macagno	IT Consultant	Italy	2/1/2010	Q1/2010	2,500.00
Katie Jordan	Farmer	USA	3/1/2010	Q1/2010	3,937.50
Luis Bonifaz	IT Consultant	Argentina	3/1/2010	Q1/2010	3,430.00



Sum of Balance Column Labels				
Row Labels	Katie Jordan	Luis Bonifaz	Maurizio Macagno	Grand Total
Q1/2010	8,437.50	7,350.00	7,500.00	23,287.50
1/1/2010	1,687.50	1,470.00	1,500.00	4,657.50
2/1/2010	2,812.50	2,450.00	2,500.00	7,762.50
3/1/2010	3,937.50	3,430.00	3,500.00	10,867.50
Q2/2010	6,975.00	6,076.00	6,200.00	19,251.00
4/1/2010	2,250.00	1,960.00	2,000.00	6,210.00
5/1/2010	2,025.00	1,764.00	1,800.00	5,589.00
6/1/2010	2,700.00	2,352.00	2,400.00	7,452.00
Q3/2010	11,475.00	9,996.00	10,200.00	31,671.00
7/1/2010	3,600.00	3,136.00	3,200.00	9,936.00
8/1/2010	5,062.50	4,410.00	4,500.00	13,972.50
9/1/2010	2,812.50	2,450.00	2,500.00	7,762.50
Q4/2010	6,862.50	5,978.00	6,100.00	18,940.50
10/1/2010	2,250.00	1,960.00	2,000.00	6,210.00
11/1/2010	2,081.25	1,813.00	1,850.00	5,744.25
12/1/2010	2,531.25	2,205.00	2,250.00	6,986.25
Grand Total	33,750.00	29,400.00	30,000.00	93,150.00

- Month level correct
- Quarter level wrong
- Year level wrong

# Semi Additive Measures in UDM

- Aggregation function:
  - LastChild
  - LastNonEmpty
- Performances not very impressive
- Aggregations always needed
- The aggregation is handled by the data model
- In DAX, there is no default aggregation function. Thus, DAX is needed.

# Semi Additive Measures

- Create a calendar table
- Add a new measure:
  - CALCULATE: to set the filter
  - LASTDATE: to find the last child

```
LastBalance = CALCULATE (  
    SUM( Balances[Balance] ),  
    LASTDATE(Date[Date])  
)
```

BANDING IN THE SELF SERVICE BI WORLD

# Banding



# Analysis of product sell price

- Price changes over time
  - Discounts
  - Price variations
- Continuous dimension
- High fragmentation
- BANDING
  - From 0 to 100 USD
  - From 101 to 500

Row Labels	Reseller Order Quantity	Reseller Sales Amount
2.29	674	\$925,21
4.99	2.571	\$7.476,60
7.95	2.411	\$11.188,37
8.6442	3.289	\$16.779,84
8.99	6.284	\$32.826,92
9.5	1.197	\$6.573,39
19.99	1.130	\$13.514,69
20.24	774	\$9.377,71
23.5481	1.877	\$26.419,61
24.49	3.621	\$52.507,99
25	1.086	\$16.225,22
27.12	448	\$7.280,43
33.6442	6.692	\$131.508,29
34.2	95	\$1.949,40
34.99	6.409	\$127.204,64
37.99	6.055	\$128.847,58
39.14	618	\$14.469,82
40.49	1.317	\$31.995,20
40.4909	531	\$12.900,38
44.54	547	\$14.530,43
46.09	56	\$1.548,62
48.0673	6.587	\$187.952,11

# The quick and dirty solution

```
= IF (  
    FactResellerSales[DiscountedPrice] <= 5,  
    "01 LOW",  
    IF (  
        FactResellerSales[DiscountedPrice] <=30,  
        "02 MEDIUM",  
        IF (  
            FactResellerSales[DiscountedPrice] <=100,  
            "03 MEDIUM",  
            IF (  
                FactResellerSales[DiscountedPrice] <= 500,  
                "04 HIGH",  
                "05 VERY HIGH"))))
```

**Even if this works... a better data model would be welcome!**

# Banding: a Data Driven Model

BandName	FromPrice	ToPrice
VERY LOW	0	5
LOW	5	30
MEDIUM	30	100
HIGH	100	500
VERY HIGH	500	9999

```
SELECT
    P.BandName,
    SUM (S.ExtendedAmount)
FROM  dbo.FactResellerSales S
      JOIN PriceBands P
      ON S.UnitPrice BETWEEN P.FromPrice AND
P.ToPrice
GROUP BY
    P.BandName
```

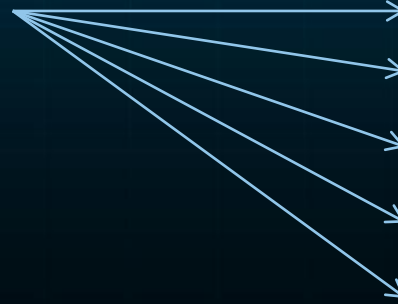
# Data Model with PowerPivot

```
SELECT
    P.BandName,
    SUM (S.ExtendedAmount)
FROM  dbo.FactResellerSales S
      JOIN PriceBands P
      ON S.UnitPrice = P.Price
GROUP BY
    P.BandName
```

BandName	Price
VERY LOW	1
VERY LOW	2
VERY LOW	3
VERY LOW	4
VERY LOW	5
LOW	6
LOW	7
...	...

# Band Expansion

BandName	FromPrice	ToPrice
VERY LOW	0	5
LOW	5	30
MEDIUM	30	100
HIGH	100	500
VERY HIGH	500	9999



BandName	Price
VERY LOW	1
VERY LOW	2
VERY LOW	3
VERY LOW	4
VERY LOW	5
LOW	6
LOW	7
...	...

- Improve the Data Model
- Cannot do this in PowerPivot
- Write VBA code to transform data
- Needs some VBA knowledge

# The VBA Code

```
For Each Row In ActiveSheet.ListObjects("PriceBands").ListRows
```

```
    Dim MinValue As Integer
```

```
    Dim MaxValue As Integer
```

```
    Dim Value As Integer
```

```
    Dim newRow As ListRow
```

```
    MinValue = Row.Range(1, 2).Value
```

```
    MaxValue = Row.Range(1, 3).Value - 1
```

```
    For Value = MinValue To MaxValue
```

```
        Set newRow = PriceBandsExpanded.ListRows.Add
```

```
        newRow.Range(1, 1) = Row.Range(1, 1)
```

```
        newRow.Range(1, 2) = Value
```

```
    Next
```

```
Next
```

PriceBand	MinPrice	MaxPrice	PriceBand	Price	Compute
VERY LOW	0	5	VERY LOW	0	
LOW	5	30	VERY LOW	1	
MEDIUM	30	100	VERY LOW	2	
HIGH	100	500	VERY LOW	3	
VERY HIGH	500	2500	VERY LOW	4	
			LOW	5	
			LOW	6	
			LOW	7	
			LOW	8	
			LOW	9	

# Issues With Band Expansion

- Need to know Visual Basic for Application
- Refresh needs two steps
- Macro Enabled WorkBooks are not safe
- Search for a new solution
- Entirely based on DAX

# Banding With DAX

- Link only the configuration table
- No need to perform expansion
- The complexity moves to the expression
- Again, DAX programming needed



# Banding With CALCULATE

- Works with the filter context
- Leverages
  - CALCULATE
  - VALUES
  - FILTER

```
= CALCULATE(  
  VALUES (PriceBands[PriceBand]),  
  FILTER (  
    PriceBands,  
    FactSales[DiscountedPrice] >= PriceBands[MinPrice]  
    && FactSales[DiscountedPrice] < PriceBands[MaxPrice]  
  )  
)
```

WHAT IF WE WANT TO CHOOSE A NEW COURIER?

# Courier Simulation

# The background

- We have some courier proposals, parameters are
  - Weight
  - Destination
- Result is «Freight»
- We need to choose the best one
- Simulation based on the past shipments
- Two problems
  - Determine the final weight of a shipment
  - Create a good simulation environment

# Freight for each courier

- For each courier, a new column
  - FILTER to find the right freight
  - MAXX to convert a table into a scalar value

```
=MAXX(  
    FILTER(  
        Couriers,  
        [Country] = Orders[Country]  
        && [MinWeight] <= Orders[Weight]  
        && Orders[Weight] < [MaxWeight]  
        && [Courier] = "SpeedyMail"),  
    Couriers[Freight])
```

# A more elegant solution

- Using CALCULATE
  - Duplicates → Error
  - Cleaner solution

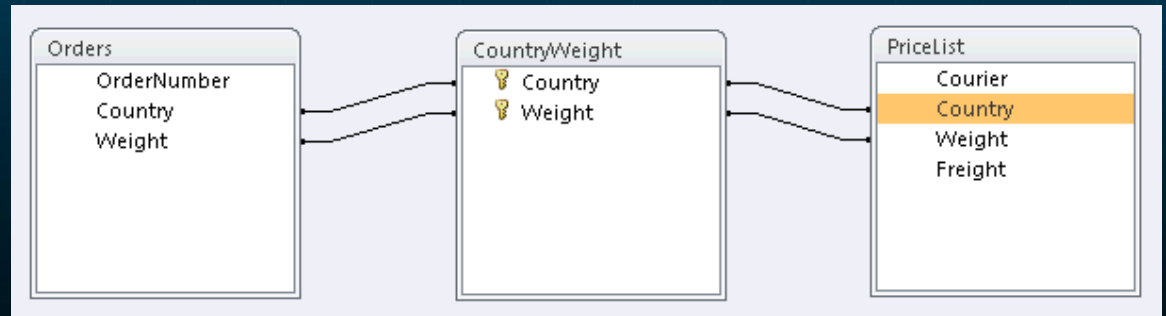
```
=CALCULATE(  
    VALUES( Couriers[Freight] ),  
    FILTER(  
        Couriers,  
        [Country] = Orders[Country]  
        && [MinWeight] <= Orders[Weight]  
        && Orders[Weight] < [MaxWeight]  
        && [Courier] = "Blu Express") )
```

# What if we have many couriers?

- One calculated column for each courier
  - Many columns
  - Data model needs to be updated based on data
  - Soon we will introduce mistakes
- New solution
  - New data model
  - Based on many to many relationship
- Problems
  - PowerPivot does not handle many to many relationships
  - Less intuitive, yet very powerful

# Data model with Many to Many

- Bridge table
  - Country
  - Weight



Two relationships

- With Orders
  - With PriceList
- Problems
    - Relationship based on two columns
    - Need to create the bridge
    - Expand the configuration

- Similar to the banding solution
- Easily solved with some VBA code





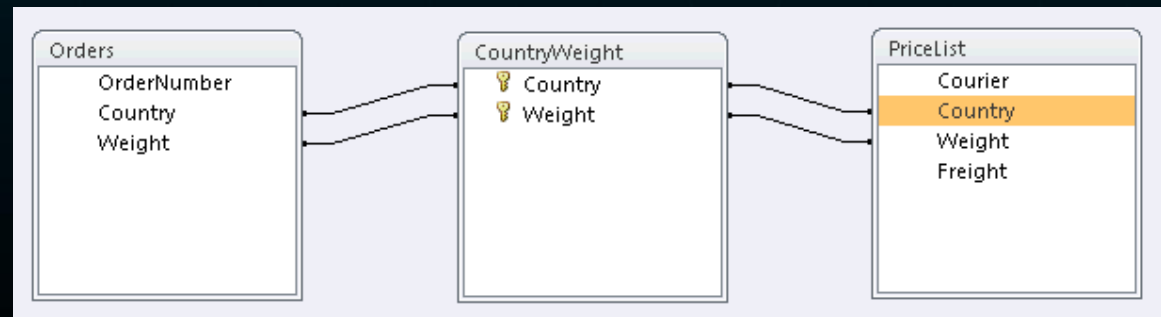
# Relationship with two columns

- PowerPivot relationships on one column only
- Solution
  - Create a new calculated column to hold the relationship
  - On all tables
  - Looks stupid? It is... ☺

Courier	Country	Weight	Freight	CountryWeight
Blu Express	Australia	1	3	Australia01
Blu Express	Australia	2	3	Australia02
Blu Express	Australia	3	3	Australia03
Blu Express	Australia	4	3	Australia04
Blu Express	Australia	5	3	Australia05
Blu Express	Australia	6	5	Australia06
Blu Express	Australia	7	5	Australia07
Blu Express	Australia	8	5	Australia08

# The DAX Formula

- Uses both evaluation contexts:
  - Filter and Row Context
- CALCULATE
  - Transforms a ROW Context into a FILTER Context

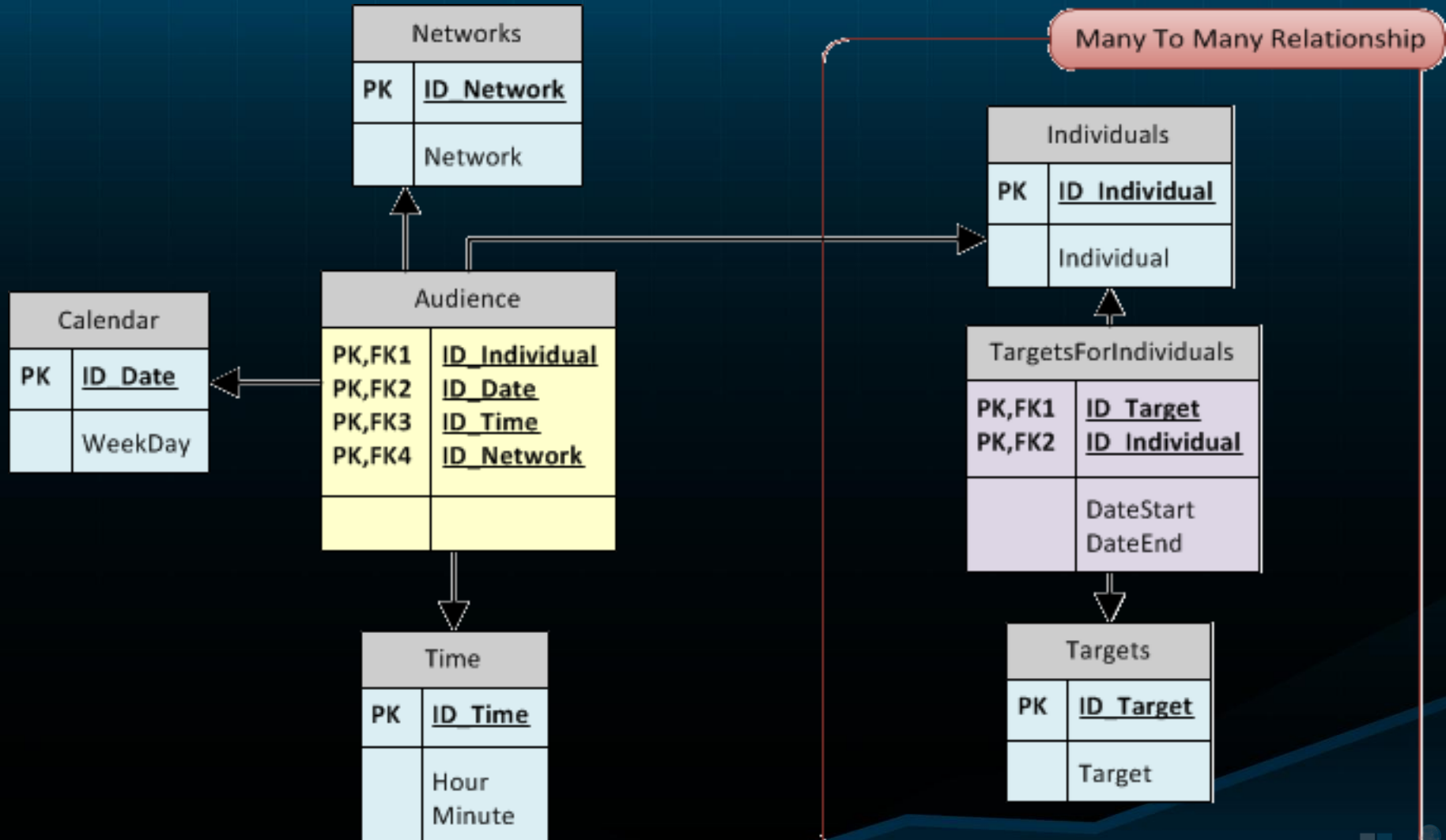


```
=SUMX(  
    Orders,  
    CALCULATE (VALUES (PriceList[Freight]))  
)
```

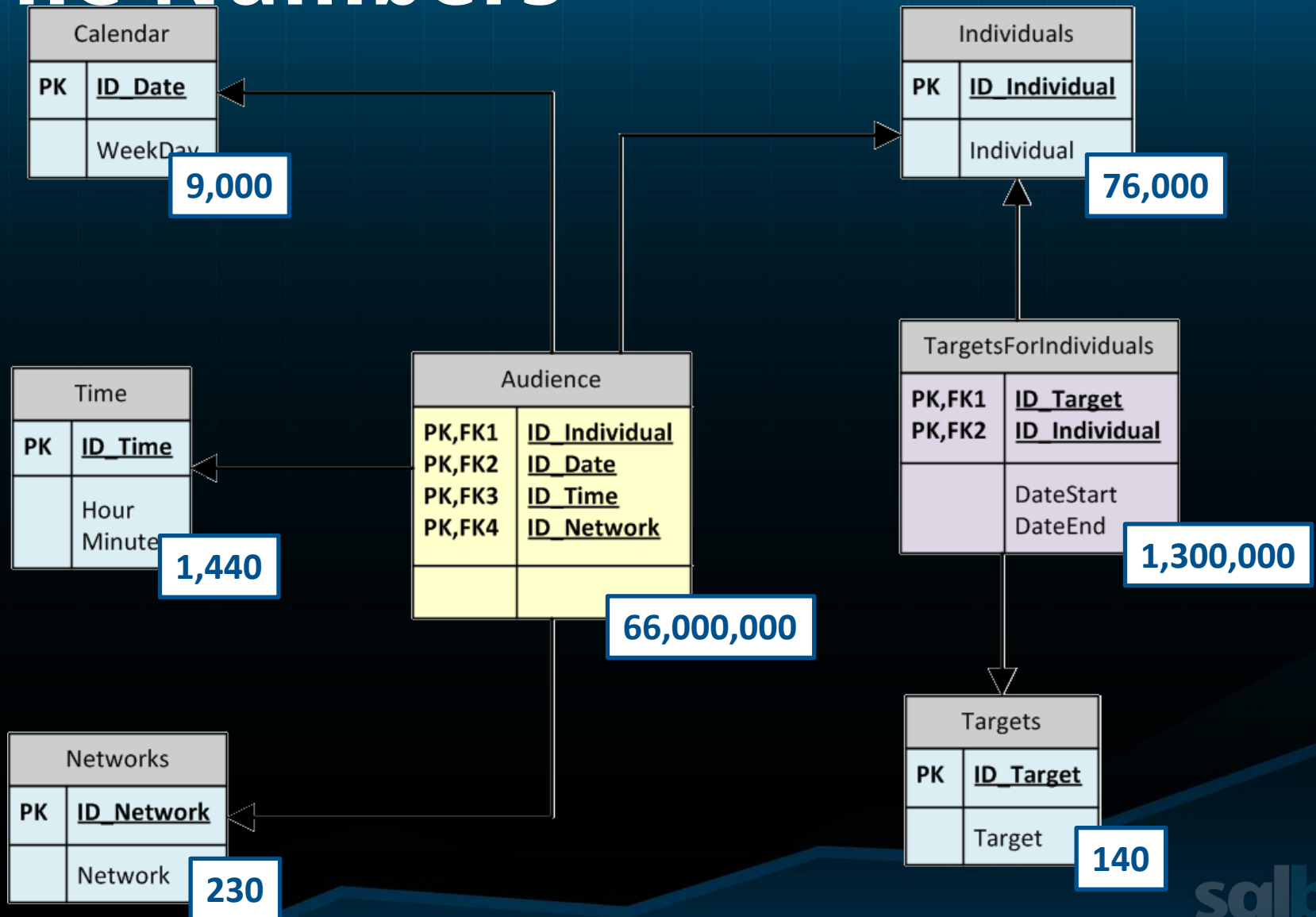
REAL-WORLD SCENARIO: AUDIENCE FOR TV BROADCASTS

# Audience Analysis and Many To Many

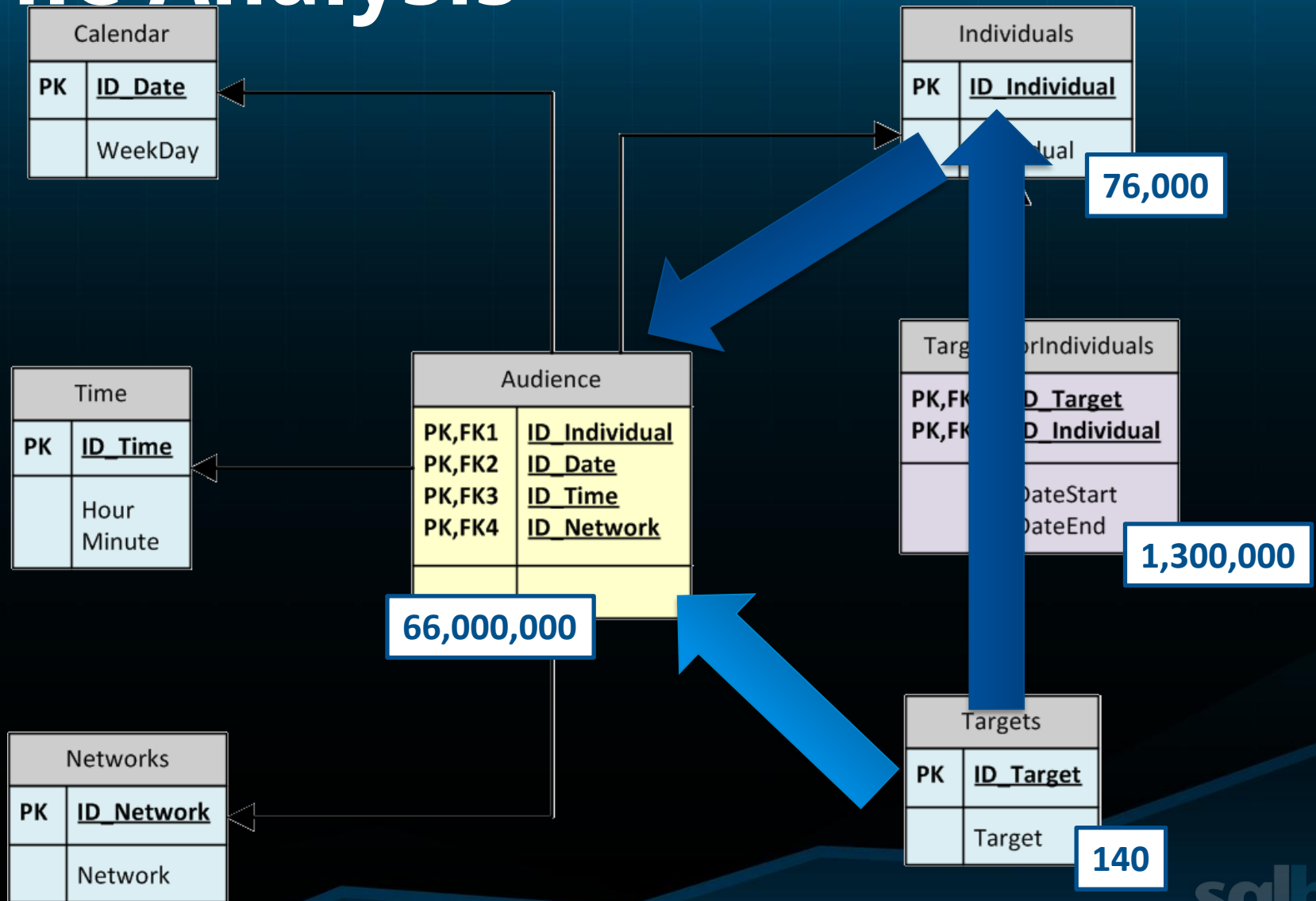
# The Data Model



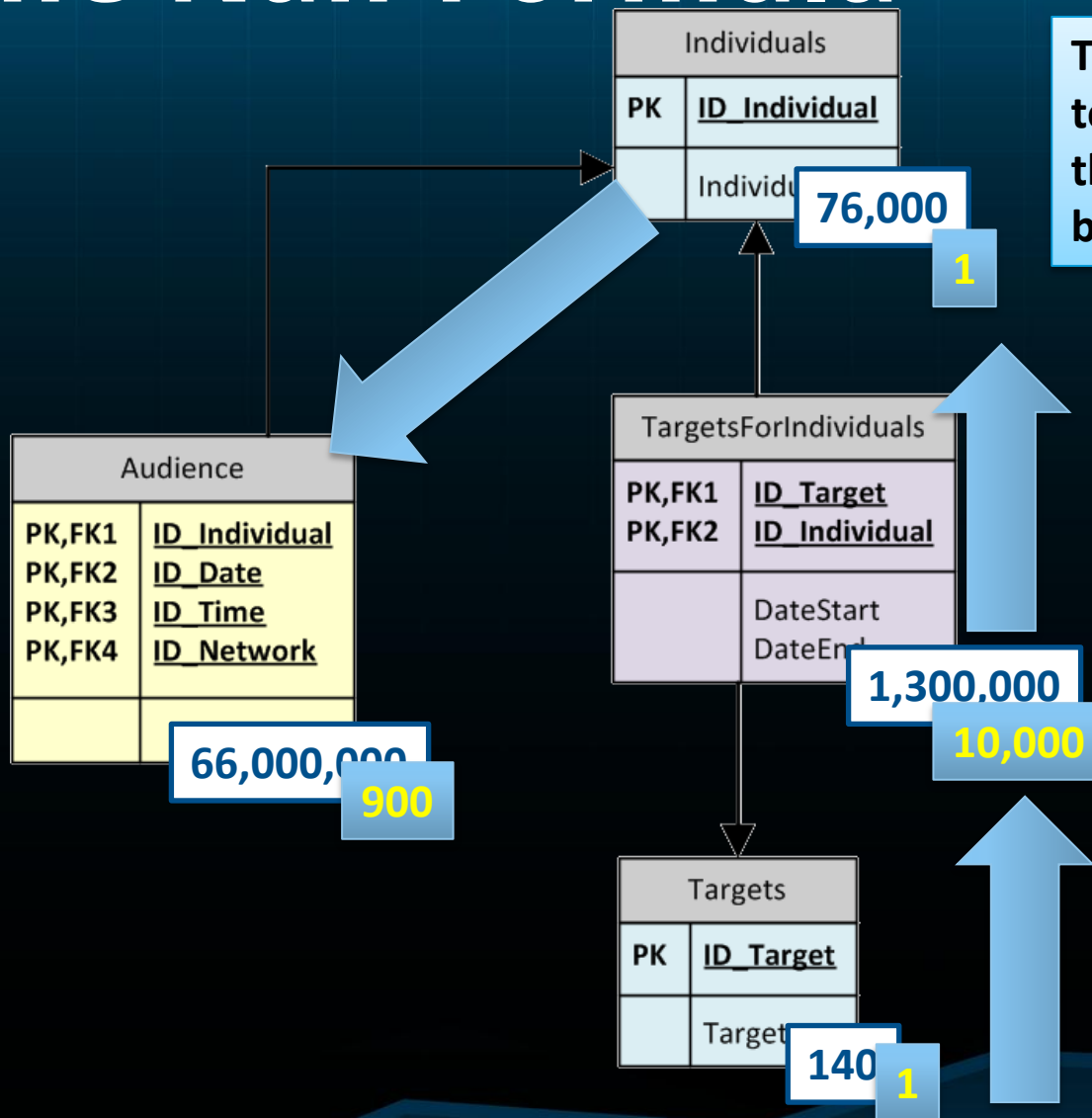
# The Numbers



# The Analysis



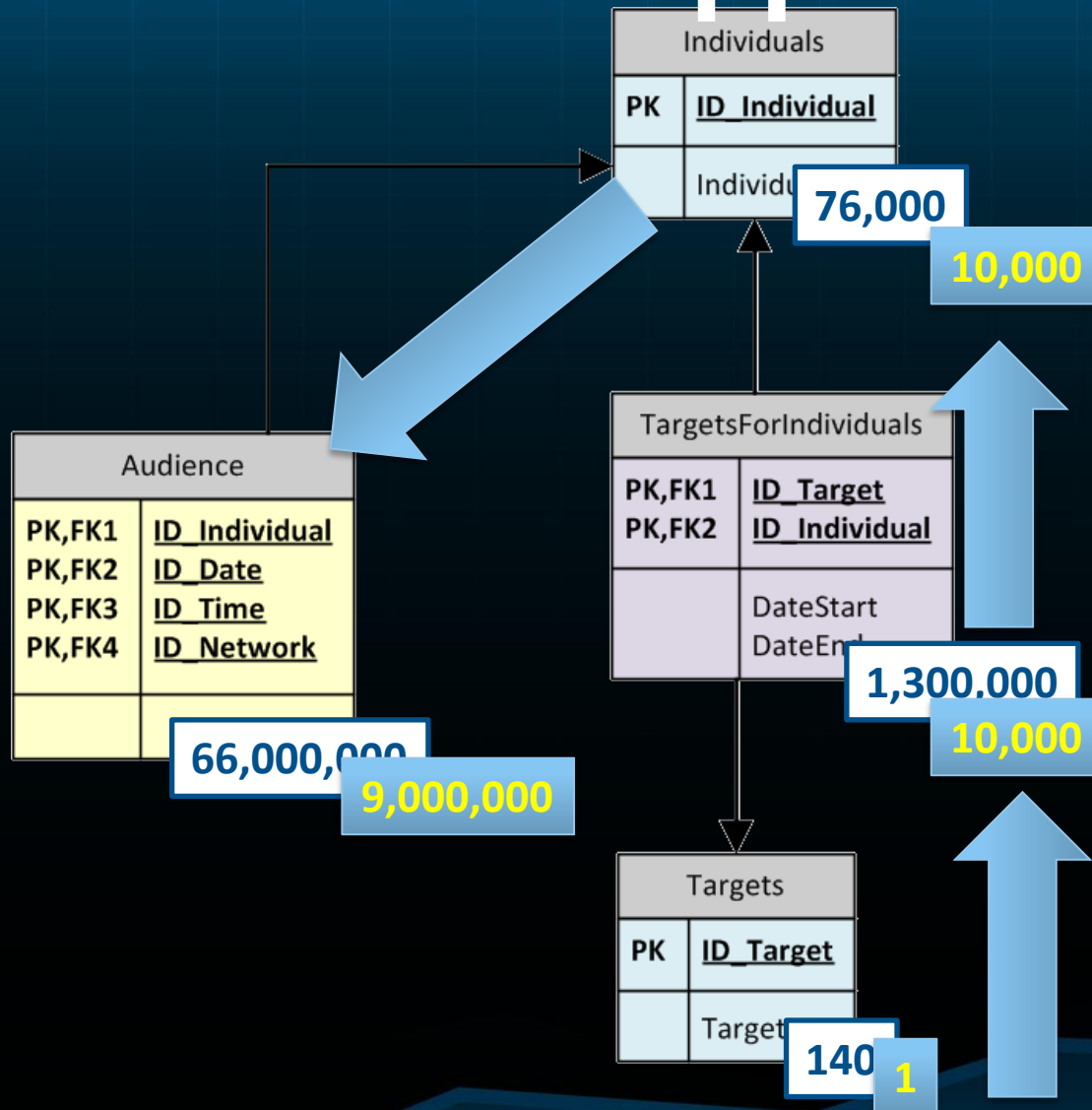
# The Naïf Formula



The Individuals table is filtered to show only 1 individual, then the Audience table is accessed but this is done 10,000 times

SUMX (  
TargetForIndividuals,  
CALCULATE (...)  
)

# A different approach



The Individuals table is filtered to show only 10,000 individuals, then the Audience table is read only once.

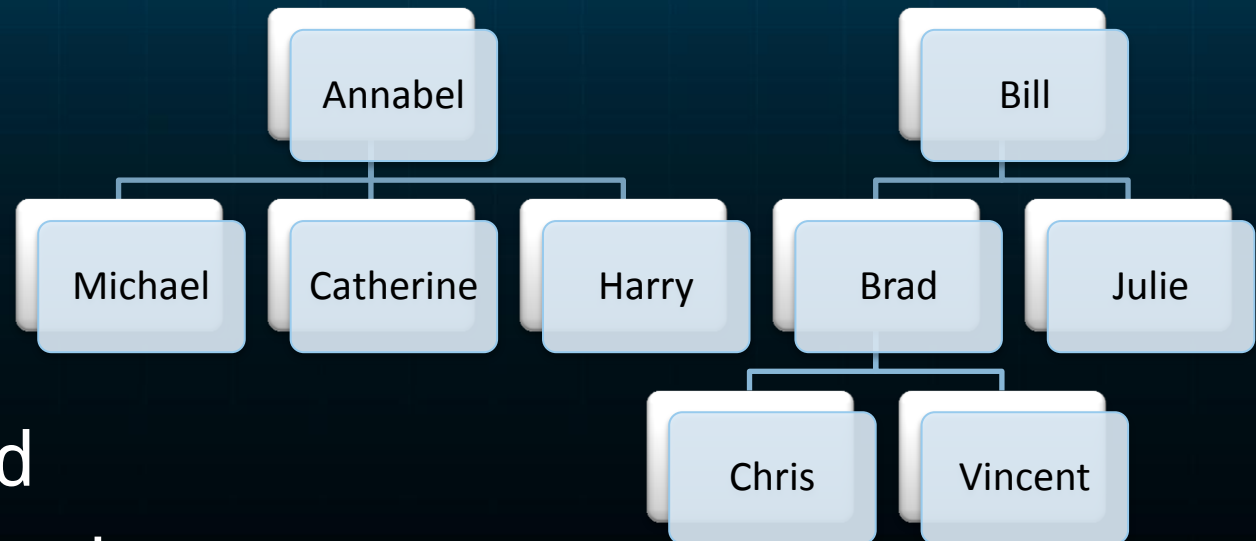
```
CALCULATE (
    ...,
    FILTER (
        VALUES (Individuals),
        CALCULATE (
            COUNTROWS (
                TargetsForIndividuals
            ) > 0
        )
    )
)
```



P/C HIERARCHIES IN POWERPIVOT, NOT VERY EASY, YET POSSIBLE.

# Parent / Child

# Parent / Child Hierarchies

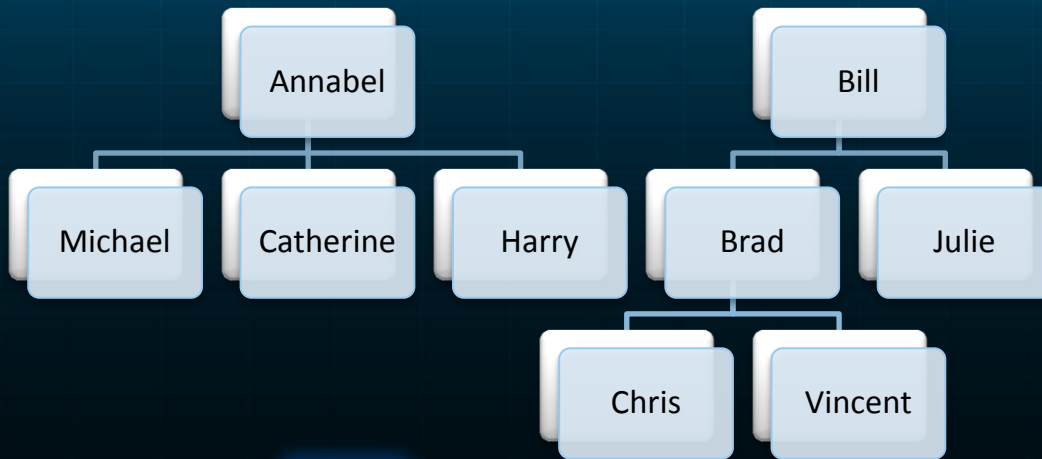


- Unbalanced
- Variable Depth
- Data present for both leaves and nodes
- Handled in UDM, not handled in BISM

# P/C Hierarchies in PowerPivot

- Simply... not present in the modeling options
- Naturalization is mandatory
  - But it is not enough
- Naturalization should be done in SQL
  - Denali will have new functions to do that in DAX

# Parent/Child: Naturalization



NodeID	Node	Level1	Level2	Level3	Level4
6	Annabel	Annabel			
7	Catherine	Annabel	Catherine		
8	Harry	Annabel	Harry		
9	Michael	Annabel	Michael		
1	Bill	Bill			
2	Brad	Bill	Brad		
4	Chris	Bill	Brad	Chris	
5	Vincent	Bill	Brad	Vincent	
3	Julie	Bill	Julie		

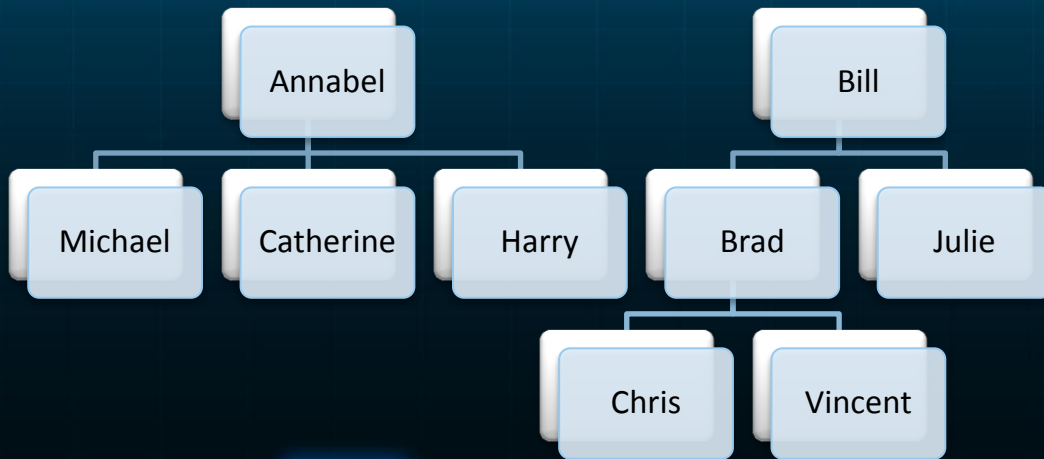
# Parent/Child: First trial

NodeID	Node	Level1	Level2	Level3	Level4	Level5
6	Annabel	Annabel				
7	Catherine	Annabel	Catherine			
8	Harry	Annabel	Harry			
9	Michael	Annabel	Michael			
1	Bill	Bill				
2	Brad	Bill	Brad			
4	Chris	Bill	Brad	Chris		
5	Vincent	Bill	Brad	Vincent		
3	Julie	Bill	Julie			



Row Labels	Sum of Amount
Annabel	3,200.00
	600.00
	600.00
Catherine	1,200.00
	1,200.00
Harry	800.00
	800.00
Michael	600.00
	600.00
Bill	1,600.00
Brad	1,300.00
	400.00
Chris	400.00
Vincent	500.00
Julie	300.00
	300.00
Grand Total	4,800.00

# Naturalization not NULL



NodeID	Node	Level1	Level2	Level3	Level4	Level5
6	Annabel	Annabel	Annabel	Annabel	Annabel	Annabel
7	Catheri...	Annabel	Catherine	Catherine	Catherine	Catherine
8	Harry	Annabel	Harry	Harry	Harry	Harry
9	Michael	Annabel	Michael	Michael	Michael	Michael
1	Bill	Bill	Bill	Bill	Bill	Bill
2	Brad	Bill	Brad	Brad	Brad	Brad
4	Chris	Bill	Brad	Chris	Chris	Chris
5	Vincent	Bill	Brad	Vincent	Vincent	Vincent
3	Julie	Bill	Julie	Julie	Julie	Julie



# Parent/Child NOT NULL

NodeID	Node	Level1	Level2	Level3	Level4	Level5
6	Annabel	Annabel	Annabel	Annabel	Annabel	Annabel
7	Catheri...	Annabel	Catherine	Catherine	Catherine	Catherine
8	Harry	Annabel	Harry	Harry	Harry	Harry
9	Michael	Annabel	Michael	Michael	Michael	Michael
1	Bill	Bill	Bill	Bill	Bill	Bill
2	Brad	Bill	Brad	Brad	Brad	Brad
4	Chris	Bill	Brad	Chris	Chris	Chris
5	Vincent	Bill	Brad	Vincent	Vincent	Vincent
3	Julie	Bill	Julie	Julie	Julie	Julie



Row Labels	Sum of Amount
<b>Annabel</b>	<b>3,200.00</b>
Annabel	600.00
Catherine	1,200.00
Harry	800.00
Michael	600.00
<b>Bill</b>	<b>1,600.00</b>
Brad	1,300.00
Chris	400.00
Vincent	500.00
<b>Julie</b>	<b>300.00</b>
Julie	300.00
<b>Grand Total</b>	<b>4,800.00</b>

# Who are those unwanted rows?

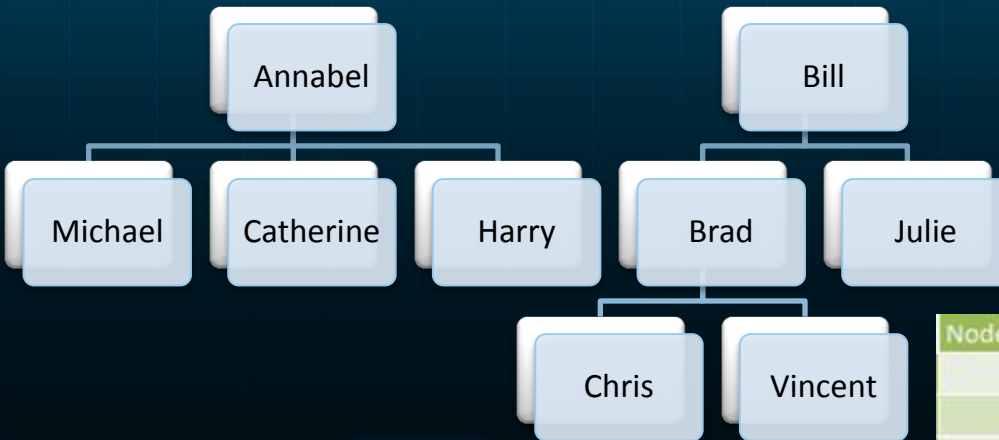
Row Labels	Sum of Amount
Annabel	3,200.00
Annabel	600.00
Annabel	600.00
Catherine	1,200.00
Catherine	1,200.00
Harry	800.00
Harry	800.00
Michael	600.00
Michael	600.00
Bill	1,600.00
Brad	1,300.00
Brad	400.00
Chris	400.00
Vincent	500.00
Julie	300.00
Julie	300.00
<b>Grand Total</b>	<b>4,800.00</b>

NodeID	Node	Level1	Level2	Level3	Level4	Level5
6	Annabel	Annabel	Annabel	Annabel	Annabel	Annabel
7	Catheri...	Annabel	Catherine	Catherine	Catherine	Catherine
8	Harry	Annabel	Harry	Harry	Harry	Harry
9	Michael	Annabel	Michael	Michael	Michael	Michael
1	Bill	Bill	Bill	Bill	Bill	Bill
2	Brad	Bill	Brad	Brad	Brad	Brad
4	Chris	Bill	Brad	Chris	Chris	Chris
5	Vincent	Bill	Brad	Vincent	Vincent	Vincent
3	Julie	Bill	Julie	Julie	Julie	Julie

Row Labels	Sum of Amount	FILTER CONTEXT ACTIVE FOR THE CELL
Annabel	3,200.00	(Level1 = "Annabel")
Annabel	600.00	(Level1 = "Annabel", Level2="Annabel")
Annabel	600.00	(Level1 = "Annabel", Level2="Annabel", Level3="Annabel")



# Double Naturalization



NodeID	Node	Level1	Level2	Level3	Level4	Level5
1	Bill	Bill	Bill	Bill	Bill	Bill
2	Brad	Bill	Brad	Brad	Brad	Brad
3	Julie	Bill	Julie	Julie	Julie	Julie
4	Chris	Bill	Brad	Chris	Chris	Chris
5	Vincent	Bill	Brad	Vincent	Vincent	Vincent
6	Annabel	Annabel	Annabel	Annabel	Annabel	Annabel
7	Catheri...	Annabel	Catherine	Catherine	Catherine	Catherine
8	Harry	Annabel	Harry	Harry	Harry	Harry
9	Michael	Annabel	Michael	Michael	Michael	Michael
-1	Bill	Bill				
-2	Brad	Bill	Brad			
-3	Julie	Bill	Julie			
-4	Chris	Bill	Brad	Chris		
-5	Vincent	Bill	Brad	Vincent		
-6	Annabel	Annabel				
-7	Catheri...	Annabel	Catherine			
-8	Harry	Annabel	Harry			
-9	Michael	Annabel	Michael			

# Double Naturalization

NodeID	Node	Level1	Level2	Level3	Level4	Level5
1	Bill	Bill	Bill	Bill	Bill	Bill
2	Brad	Bill	Brad	Brad	Brad	Brad
3	Julie	Bill	Julie	Julie	Julie	Julie
4	Chris	Bill	Brad	Chris	Chris	Chris
5	Vincent	Bill	Brad	Vincent	Vincent	Vincent
6	Annabel	Annabel	Annabel	Annabel	Annabel	Annabel
7	Catheri...	Annabel	Catherine	Catherine	Catherine	Catherine
8	Harry	Annabel	Harry	Harry	Harry	Harry
9	Michael	Annabel	Michael	Michael	Michael	Michael
-1	Bill	Bill				
-2	Brad	Bill	Brad			
-3	Julie	Bill	Julie			

Row Labels	Sum of Amount	CountOfNodeID
Annabel	3,200.00	8.00
Annabel		1.00
Catherine		1.00
Harry		1.00
Michael		1.00
Annabel	600.00	1.00
Annabel	600.00	1.00
Catherine	1,200.00	2.00
Harry	800.00	2.00
Michael	600.00	2.00
Bill	1,600.00	10.00

## FILTER CONTEXT ACTIVE FOR THE CELL

(Level1 = "Annabel")

(Level1 = "Annabel", Level2="")

(Level1 = "Annabel", Level2="", Level3="")

(Level1 = "Annabel", Level2="Annabel")

(Level1 = "Annabel", Level2="Annabel", Level3="Annabel")

# Double Naturalization

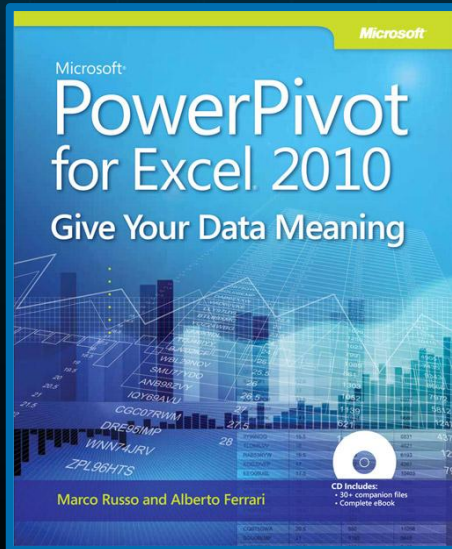
Row Labels	Sum of Amount	CountOfNodeID	FILTER CONTEXT ACTIVE FOR THE CELL
Annabel	3,200.00	8.00	(Level1 = "Annabel")
Annabel		1.00	(Level1 = "Annabel", Level2="")
Annabel	600.00	1.00	(Level1 = "Annabel", Level2="", Level3="")
Annabel	600.00	1.00	(Level1 = "Annabel", Level2="Annabel")
Catherine	1,200.00	2.00	(Level1 = "Annabel", Level2="Annabel", Level3="Annabel")
Catherine		1.00	
Catherine	1,200.00	1.00	
Harry	800.00	2.00	
Harry		1.00	
Harry	800.00	1.00	
Michael	600.00	2.00	
Michael		1.00	
Michael	600.00	1.00	
Bill	1,600.00	10.00	

=IF(  
 [CountOfNodeID] > 1,  
 SUM (Invoices[Amount]),  
 BLANK ()  
 )

Row Labels	Sum of Amount	SumOfAmount
Annabel	3,200.00	3,200.00
Annabel	600.00	
Annabel	600.00	
Catherine	1,200.00	1,200.00
Catherine	1,200.00	
Harry	800.00	800.00
Harry	800.00	
Michael	600.00	600.00
Michael	600.00	

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# Questions and Answers

# Links

- SQLBI Website  
[www.sqlbi.com](http://www.sqlbi.com)
- PowerPivot Workshop  
[www.powerpivotworkshop.com](http://www.powerpivotworkshop.com)
- Marco Russo blog  
[www.sqlblog.com/blogs/marco\\_russo](http://www.sqlblog.com/blogs/marco_russo)
- Alberto Ferrari blog  
[www.sqlblog.com/blogs/alberto\\_ferrari](http://www.sqlblog.com/blogs/alberto_ferrari)

For any question contact us at  
[info@sqlbi.com](mailto:info@sqlbi.com)

# Thank you!