

Assignment_3_DataBase Management

Konstantinos Chronis (BAFT1502)

Assignment Supervisors:

Prof. D. Xatziantoniou

S.Safras

In this assignment we were asked to create a star/snowflake schema in a data warehouse from a dataset we have found online. The snowflake option was selected.

In computing, a **snowflake schema** is a logical arrangement of tables in a multidimensional database such that the entity relationship diagram resembles a snowflake shape. The snowflake schema is represented by centralized fact tables which are connected to multiple dimensions. "Snowflaking" is a method of normalising the dimension tables in a star schema. When it is completely normalised along all the dimension tables, the resultant structure resembles a snowflake with the fact table in the middle. The principle behind snowflaking is normalisation of the dimension tables by removing low cardinality attributes and forming separate tables.

The dataset used for the purposes of this assignment is a Watson Analytics Sample Dataset of Sales Products consisting of 88476 rows of data. This was chosen because of the great dimension expansion capabilities. The dataset contains information regarding the revenue and the gross margin made by retailer shops and stores all for the countries collected in this dataset, the orders from the customers (including the quantities), the products and the year of the order placement and other key metrics.

A full description of the dataset is shown below:

Retailer type: Outdoor shop, Golf shop, Department Store, Sports Store, Eyewear Store, Warehouse Store

Country: Country of the shop's location

Order method type: Fax, Telephone, Email, Sales visit, Mail, Web

Product: Description of the product

Product type: Type of the product (i.e. Cooking Gear, Tools, Eyewear)

Product line: Camping Equipment, Personal Accessories, Mountaineering Equipment, Outdoor Equipment, Golf Equipment

Year: Year of the order placement

Quarter: Quarter of that year

Revenue: Total revenue of the shop/store

Quantity: Number of units ordered

Gross margin: The Gross Margin of the shop/store

A screenshot of the first rows of the dataset.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
	Retailer type	Retailer country	Order method type	Product type	Product line	Product	Year	Quarter	Revenue	Gross margin	Quantity								
1	Outdoors Shop	United States	Fax	Cooking Gear	Camping Equipment	TrailChef Deluxe Cook Set	2012	Q1 2012	59628.66	0.34754797	489								
2	Outdoors Shop	United States	Fax	Cooking Gear	Camping Equipment	TrailChef Double Flame	2012	Q1 2012	35550.32	0.47427465	252								
3	Outdoors Shop	United States	Fax	Tents	Camping Equipment	Star Dome	2012	Q1 2012	89460.48	0.32777197	147								
4	Outdoors Shop	United States	Fax	Tents	Camping Equipment	Star Gazer 2	2012	Q1 2012	165883.41	0.28293788	303								
5	Outdoors Shop	United States	Fax	Sleeping Bags	Camping Equipment	Hibernator Lite	2012	Q1 2012	119822.2	0.29145017	1415								
6	Outdoors Shop	United States	Fax	Sleeping Bags	Camping Equipment	Hibernator Extreme	2012	Q1 2012	87728.36	0.39814629	352								
7	Outdoors Shop	United States	Fax	Sleeping Bags	Camping Equipment	Hibernator Camp Cot	2012	Q1 2012	41837.46	0.33560737	426								
8	Outdoors Shop	United States	Fax	Lanterns	Camping Equipment	Firefly Lite	2012	Q1 2012	8268.41	0.52896022	577								
9	Outdoors Shop	United States	Fax	Lanterns	Camping Equipment	Firefly Extreme	2012	Q1 2012	9393.3	0.43420523	189								
10	Outdoors Shop	United States	Fax	Lanterns	Camping Equipment	EverGlow Butane	2012	Q1 2012	19396.5	0.48140254	379								
11	Outdoors Shop	United States	Fax	Lanterns	Camping Equipment	EverGlow Butane	2012	Q1 2012	6940.03	0.36186587	109								
12	Outdoors Shop	United States	Fax	Rope	Mountaineering Equipment	Husky Rope 50	2012	Q1 2012	20003.2	0.32905585	133								
13	Outdoors Shop	United States	Fax	Rope	Mountaineering Equipment	Husky Rope 60	2012	Q1 2012	14109.4	0.29165733	79								
14	Outdoors Shop	United States	Fax	Rope	Mountaineering Equipment	Husky Rope 100	2012	Q1 2012	79370.22	0.30126435	227								
15	Outdoors Shop	United States	Fax	Rope	Mountaineering Equipment	Husky Rope 200	2012	Q1 2012	77288.64	0.31477575	143								
16	Outdoors Shop	United States	Fax	Safety	Mountaineering Equipment	Granite Climbing helmet	2012	Q1 2012	42144.88	0.24146888	898								
17	Outdoors Shop	United States	Fax	Safety	Mountaineering Equipment	Husky Harness	2012	Q1 2012	34154.9	0.28303139	559								
18	Outdoors Shop	United States	Fax	Safety	Mountaineering Equipment	Husky Harness Extreme	2012	Q1 2012	36396.8	0.47843327	352								
19	Outdoors Shop	United States	Fax	Safety	Mountaineering Equipment	Granite Signal Mirror	2012	Q1 2012	4074.84	0.51422387	126								
20	Outdoors Shop	United States	Fax	Climbing Accessories	Mountaineering Equipment	Granite Carabiner	2012	Q1 2012	11212.72	0.4787234	4022								
21	Outdoors Shop	United States	Fax	Climbing Accessories	Mountaineering Equipment	Granite Belay	2012	Q1 2012	19476.8	0.47613982	296								
22	Outdoors Shop	United States	Fax	Climbing Accessories	Mountaineering Equipment	Granite Pulley	2012	Q1 2012	15739.22	0.50217037	427								
23	Outdoors Shop	United States	Fax	Climbing Accessories	Mountaineering Equipment	Firefly Climbing Lamp	2012	Q1 2012	17998.36	0.42768755	464								
24	Outdoors Shop	United States	Fax	Climbing Accessories	Mountaineering Equipment	Firefly Charger	2012	Q1 2012	34494	0.54488054	710								
25	Outdoors Shop	United States	Fax	Climbing Accessories	Mountaineering Equipment	Firefly Rechargeable Battery	2012	Q1 2012	11673.6	0.58984375	1520								
26	Outdoors Shop	United States	Fax	Climbing Accessories	Mountaineering Equipment	Granite Chalk Bag	2012	Q1 2012	4621.68	0.51643991	262								
27	Outdoors Shop	United States	Fax	Tools	Mountaineering Equipment	Granite Ice	2012	Q1 2012	22041.6	0.48178191	333								
28	Outdoors Shop	United States	Fax	Tools	Mountaineering Equipment	Granite Hammer	2012	Q1 2012	18118.38	0.2434158	241								
29	Outdoors Shop	United States	Fax	Tools	Mountaineering Equipment	Granite Shovel	2012	Q1 2012	9543.16	0.33699948	164								
30	Outdoors Shop	United States	Fax	Tools	Mountaineering Equipment	Granite Grip	2012	Q1 2012	10146.2	0.49020619	523								
31	Outdoors Shop	United States	Fax	Tools	Mountaineering Equipment	Granite Axe	2012	Q1 2012	33070.4	0.49166667	856								
32	Outdoors Shop	United States	Fax	Tools	Mountaineering Equipment	Granite Extreme	2012	Q1 2012	42563.2	0.38138298	566								
33	Outdoors Shop	United States	Fax	Watches	Personal Accessories	Mountain Man Extreme	2012	Q1 2012	6499.8	0.5888535	23								
34	Outdoors Shop	United States	Fax	Eyewear	Personal Accessories	Polar Sun	2012	Q1 2012	7015.34	0.56786472	116								
35	Outdoors Shop	United States	Fax	Eyewear	Personal Accessories	Polar Ice	2012	Q1 2012	3825.8	0.51943907	37								
36	Outdoors Shop	United States	Fax	Knives	Personal Accessories	Edge Extreme	2012	Q1 2012	30940.25	0.28895209	275								
37	Outdoors Shop	United States	Fax	Knives	Personal Accessories	Bear Survival Edge	2012	Q1 2012	8414.75	0.48118801	97								
38	Outdoors Shop	United States	Fax	Navigation	Personal Accessories	Glacier GPS Extreme	2012	Q1 2012	38534.38	0.47770303	114								
39	Outdoors Shop	United States	Fax	Insect Repellents	Outdoor Protection	Bugfield Extreme	2012	Q1 2012	25010.38	0.63221884	3801								
40	Outdoors Shop	United States	Fax	Sunscreen	Outdoor Protection	Sun Shelter Stick	2012	Q1 2012	5718.15	0.55087629	1179								

Regarding the data cleaning usually required in similar cases, this particular dataset is in such a condition that does not require any cleaning.

First we connect to the MySQL Workbench and create the schema named sales.

Apply SQL Script to Database

Review SQL Script
Apply SQL Script

Review the SQL Script to be Applied on the Database

Online DDL
Algorithm: Default Lock Type: Default

```

1 CREATE SCHEMA `sales` ;
2

```

Back Apply Cancel

Then we proceed to the creation of the tables-dimensions along with the fact table as shown below:

```
CREATE TABLE IF NOT EXISTS country_dimension (  
country_ID INT NOT NULL AUTO_INCREMENT,  
country NVARCHAR(45),  
PRIMARY KEY (country_ID));
```

```
CREATE TABLE IF NOT EXISTS retailer_dimension (  
retailer_ID INT NOT NULL AUTO_INCREMENT,  
type NVARCHAR(45),  
PRIMARY KEY(retailer_ID));
```

```
CREATE TABLE IF NOT EXISTS order_dimension (  
order_ID INT NOT NULL AUTO_INCREMENT,  
method_type NVARCHAR(45),  
PRIMARY KEY(order_ID));
```

```
CREATE TABLE IF NOT EXISTS type_dimension (  
type_ID INT NOT NULL AUTO_INCREMENT,  
type NVARCHAR(45),  
PRIMARY KEY (type_ID));
```

```
CREATE TABLE IF NOT EXISTS line_dimension (  
line_ID INT NOT NULL AUTO_INCREMENT,  
line NVARCHAR(45),  
type_ID INT NOT NULL,  
PRIMARY KEY (line_ID),  
FOREIGN KEY(type_ID) REFERENCES type_dimension(type_ID));
```

```
CREATE TABLE IF NOT EXISTS product_dimension (  
    product_ID INT NOT NULL AUTO_INCREMENT,  
    description NVARCHAR(45),  
    line_ID INT NOT NULL,  
    PRIMARY KEY (product_ID),  
    FOREIGN KEY(line_ID) REFERENCES line_dimension(line_ID));
```

```
CREATE TABLE IF NOT EXISTS year_dimension (  
    year_ID INT NOT NULL AUTO_INCREMENT,  
    year INT,  
    PRIMARY KEY(year_ID));
```

```
CREATE TABLE IF NOT EXISTS quarter_dimension (  
    quarter_ID INT NOT NULL AUTO_INCREMENT,  
    quarter NVARCHAR(45),  
    year_ID INT NOT NULL,  
    PRIMARY KEY(quarter_ID),  
    FOREIGN KEY (year_ID) REFERENCES year_dimension(year_ID));
```

```
CREATE TABLE IF NOT EXISTS Sales_fact (  
    sales_ID INT NOT NULL AUTO_INCREMENT,  
    retailer_ID INT NOT NULL,  
    product_ID INT NOT NULL,  
    quarter_ID INT NOT NULL,  
    order_ID INT NOT NULL,  
    country_ID INT NOT NULL,
```

```
Revenue DECIMAL(10,2),  
Quantity INT,  
Gross_Market DECIMAL(10,2),  
PRIMARY KEY(sales_ID),  
FOREIGN KEY (retailer_ID) REFERENCES retailer_dimension(retailer_ID),  
FOREIGN KEY (product_ID) REFERENCES product_dimension(product_ID),  
FOREIGN KEY (quarter_ID) REFERENCES quarter_dimension(quarter_ID),  
FOREIGN KEY (order_ID) REFERENCES order_dimension(order_ID),  
FOREIGN KEY (country_ID) REFERENCES country_dimension(country_ID));
```

We will also need a temporary table to insert all the dataset and load from it to insert the correct values in the dimensions

```
CREATE TABLE IF NOT EXISTS temp (  
Retailer_Type NVARCHAR(45),  
Retailer_Country NVARCHAR(45),  
Order_method_type NVARCHAR(45),  
Product NVARCHAR(45),  
Product_Type NVARCHAR(45),  
Product_line NVARCHAR(45),  
Year NVARCHAR(45),  
Quarter NVARCHAR(45),  
Gross_Market DECIMAL(10,3),  
Revenue DECIMAL(10,2),  
Quantity INT);
```

The import of all the data into the temp table was made by :

```
load data local infile 'C:/Users/kos_c/Desktop/WA_Sales_Products.csv' into table temp  
fields terminated by ';'   
  
enclosed by '"'   
  
lines terminated by '\n'
```

Then the import of all the data to the tables-dimensions is implemented by the INSERT INTO command. An example is presented below:

INSERT INTO line_dimension (line, type_ID)

SELECT DISTINCT(temp.Product_line), type_dimension.type_ID

FROM temp, type_dimension

WHERE temp.Product_Type = type_dimension.type

The most challenging was the INSERT for the fact table sales_fact as shown below:

INSERT INTO sales_fact (Revenue,Quantity,Gross_Market,retailer_ID,product_ID, quarter_ID,order_ID,country_ID)

SELECT temp.Revenue,temp.Quantity,temp.Gross_Market, retailer_dimension.retailer_ID,product_dimension.product_ID,quarter_dimension.quarter_ID,order_dimension.order_ID,country_dimension.country_ID

FROM temp,retailer_dimension,product_dimension,quarter_dimension,order_dimension, country_dimension

WHERE temp.Product = product_dimension.description AND temp.Retailer_Country = country_dimension.country

AND temp.Order_method_type = order_dimension.method_type AND temp.Quarter = quarter_dimension.quarter AND temp.Retailer_Type = retailer_dimension.type

A screenshot of the process is of the filled fact table is presented below:

The screenshot displays a SQL query execution environment. The query editor at the top shows the following query:

```
SELECT * FROM sales_fact;
```

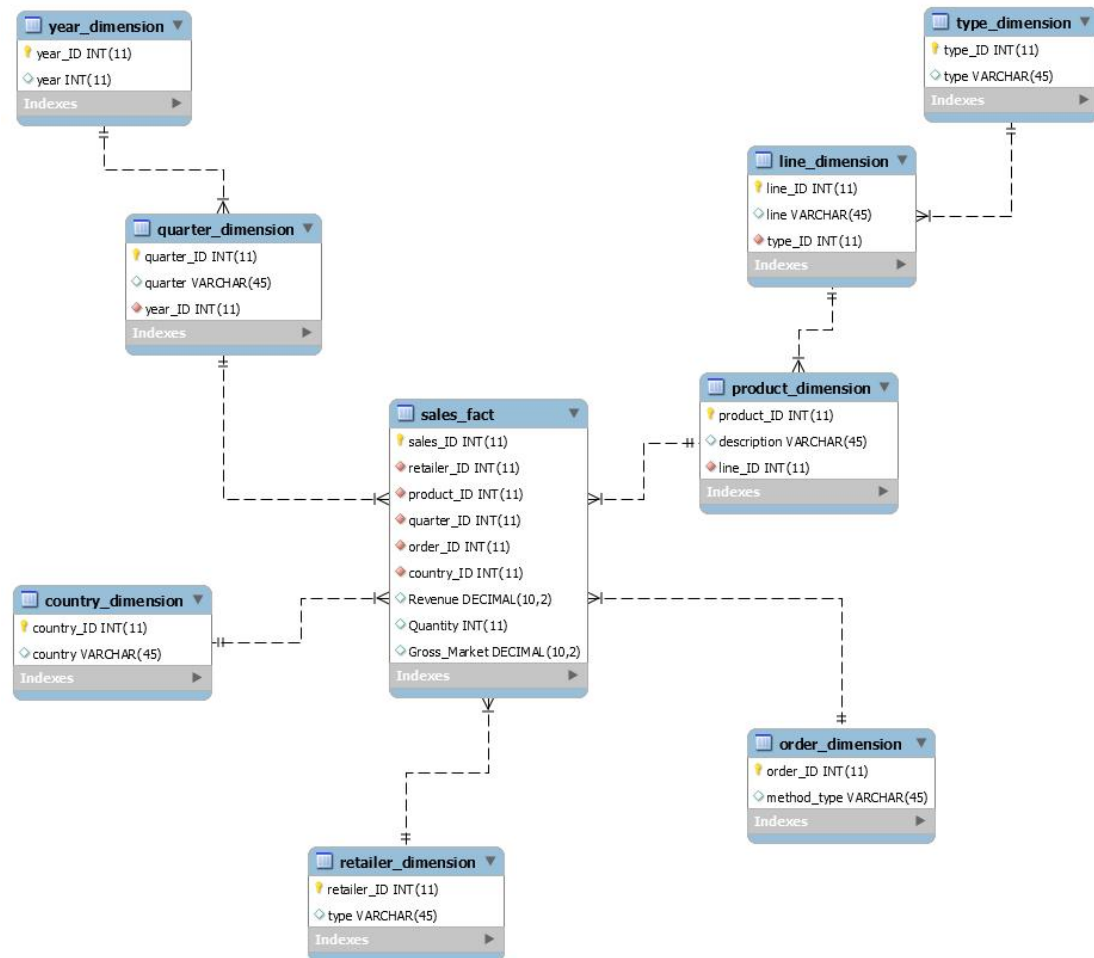
The result grid below the query editor shows the following data:

sales_ID	retailer_ID	product_ID	quarter_ID	order_ID	country_ID	Revenue	Quantity	Gross_Market
76	1	3	1	4	6	899070.40	310	0.35
77	3	3	1	4	7	102177.28	167	0.35
78	6	3	1	4	7	102177.28	167	0.35
79	3	3	1	5	7	85657.60	140	0.35
80	1	3	1	4	8	107683.84	176	0.35
81	1	4	1	1	1	165883.41	303	0.28
82	3	4	1	2	1	165335.94	302	0.28
83	4	4	1	2	1	603311.94	1102	0.28
84	6	4	1	2	1	182854.98	334	0.28
85	1	4	1	4	1	312057.90	570	0.28
86	6	4	1	4	1	166430.88	304	0.28
87	7	4	1	5	1	164788.47	301	0.28
88	7	4	1	4	2	218440.53	399	0.28

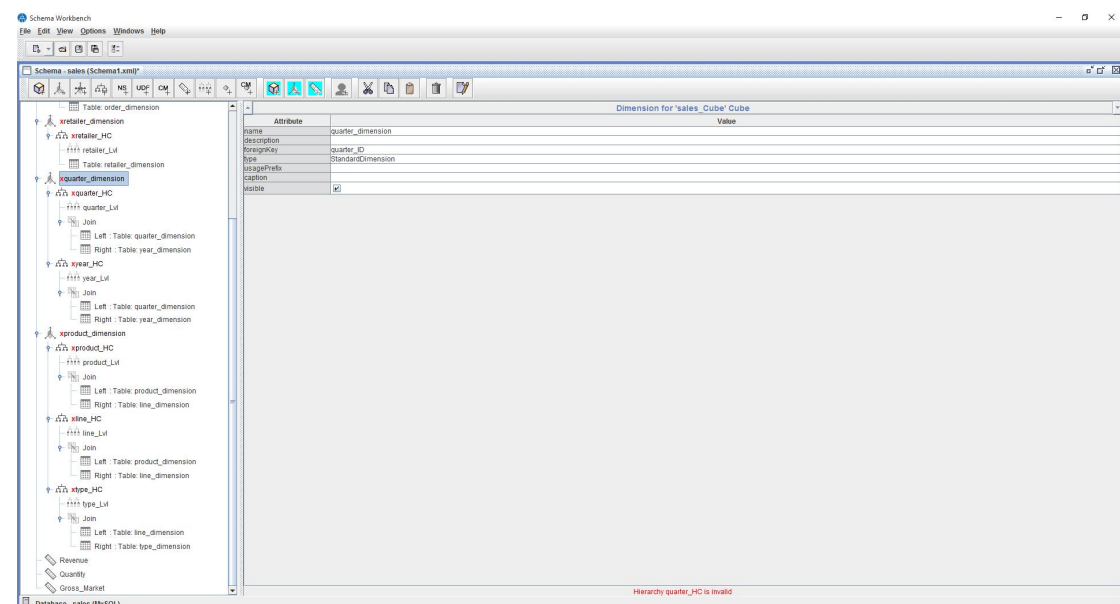
The output window at the bottom shows the execution progress and results:

Time	Action	Message	Duration / Fetch
26 17:07:50	SELECT * FROM sales_fact	88475 row(s) returned	0.250 sec / 3.203 sec
27 17:15:33	SELECT * FROM sales_fact	88475 row(s) returned	0.109 sec / 5.454 sec
28 17:15:41	SELECT * FROM sales_fact	88475 row(s) returned	0.062 sec / 2.297 sec
29 17:15:45	SELECT * FROM sales_fact	88475 row(s) returned	0.093 sec / 2.110 sec
30 17:15:50	SELECT * FROM sales_fact	88475 row(s) returned	0.031 sec / 2.578 sec
31 17:15:54	SELECT * FROM sales_fact	88475 row(s) returned	0.047 sec / 3.578 sec

At this point an EeR diagram was designed to get a clearer view of the snowflake schema created in this assignment.



An attempt to create the .xml file in the Pentaho Schema Workbench was made as shown below:



But the final .xml file was updated by hand in the Notepad following the instructions provided http://mondrian.pentaho.com/documentation/schema.php#Star_schemas. The complete working .xml file is included in the zip of the assignment. Regarding the measures of this analysis the Revenue and the Gross Margin were selected in their average, while the Quantity to be shown in its counted units.

Then in the Pentaho Business Analytics we create the JPivot reports as presented below:

country_HC	quarter_HC	retailer_HC	order_HC	product_HC	Revenue	Gross_Market	Quantity
All country_dimension.country_HCs	All quarter_dimension.quarter_HCs	All retailer_dimension.retailer_HCs	All order_dimension.order_HCs	All product_dimension.product_HCs	42,639.192	0.412	87,894
United States	All quarter_dimension.quarter_HCs	All retailer_dimension.retailer_HCs	All order_dimension.order_HCs	All product_dimension.product_HCs	86,984.551	0.419	7,449
Canada	All quarter_dimension.quarter_HCs	All retailer_dimension.retailer_HCs	All order_dimension.order_HCs	All product_dimension.product_HCs	41,683.313	0.427	5,904
	2012	All retailer_dimension.retailer_HCs	All order_dimension.order_HCs	All product_dimension.product_HCs	32,611.212	0.384	2,306
	Q1 2012	All retailer_dimension.retailer_HCs	All order_dimension.order_HCs	All product_dimension.product_HCs	32,025.459	0.441	604
	Q2 2012	All retailer_dimension.retailer_HCs	All order_dimension.order_HCs	All product_dimension.product_HCs	31,272.446	0.443	561
				Camping Equipment	36,538.621	0.414	157
				Cooking Gear	21,722.563	0.43	40
				Tents	89,388.835	0.354	24
				Star Dome	54,785.645	0.367	6
				Star Gazer 2	141,057.862	0.28	4
				Star Gazer 6	29,527.715	0.378	4
				Star Peg	5,388.693	0.493	3
				Star Lite	202,080.938	0.3	4
				Star Gazer 3	102,462.01	0.33	3
				Sleeping Bags	41,126.811	0.417	27
				Lanterns	10,747.875	0.44	43
				Packs	52,565.683	0.393	23
				Mountaineering Equipment	37,187.446	0.405	41
				Personal Accessories	28,199.059	0.425	270
				Outdoor Protection	8,284.819	0.618	42
				Golf Equipment	45,094.519	0.515	51
	Q3 2012	All retailer_dimension.retailer_HCs	All order_dimension.order_HCs	All product_dimension.product_HCs	30,956.137	0.448	574
	Q4 2012	All retailer_dimension.retailer_HCs	All order_dimension.order_HCs	All product_dimension.product_HCs	35,279.517	0.202	567

There can be many interpretations from the report above. An example could be that in Canada in the 2nd quarter of 2012 the product named as “Star Dome” provided an average revenue of 54,785.645 by all order methods in all retailers shops, while the “Star Gazer 6” an average of 29,527.715.

Another report is shown below:

country_HC	quarter_HC	retailer_HC	order_HC	product_HC	Revenue	Gross_Market	Quantity
All country_dimension.country_HCs	All quarter_dimension.quarter_HCs	All retailer_dimension.retailer_HCs	All order_dimension.order_HCs	All product_dimension.product_HCs	42,639.192	0.412	87,894
United States	All quarter_dimension.quarter_HCs	All retailer_dimension.retailer_HCs	All order_dimension.order_HCs	All product_dimension.product_HCs	86,984.551	0.419	7,449
Canada	All quarter_dimension.quarter_HCs	All retailer_dimension.retailer_HCs	All order_dimension.order_HCs	All product_dimension.product_HCs	41,683.313	0.427	5,904
Mexico	All quarter_dimension.quarter_HCs	All retailer_dimension.retailer_HCs	All order_dimension.order_HCs	All product_dimension.product_HCs	36,248.238	0.446	3,818
Brazil	All quarter_dimension.quarter_HCs	All retailer_dimension.retailer_HCs	All order_dimension.order_HCs	All product_dimension.product_HCs	33,171.381	0.383	3,273
				Camping Equipment	36,849.365	0.413	956
				Mountaineering Equipment	49,027.148	0.421	231
				Personal Accessories	30,721.235	0.43	1,489
				Outdoor Protection	3,425.098	-0.068	309
				Golf Equipment	53,585.747	0.514	288
				Iron	65,520.353	0.474	79
				Woods	94,141.833	0.486	75
				Putters	38,777.392	0.47	56
				Golf Accessories	14,144.841	0.61	78
				Course Pro Golf and Tee Set	10,515.478	0.667	18
				Course Pro Undervela	11,970.248	0.478	21
				Course Pro Golf Bag	24,514.251	0.617	20
				Course Pro Gloves	9,934.835	0.696	19
Japan	All quarter_dimension.quarter_HCs	All retailer_dimension.retailer_HCs	All order_dimension.order_HCs	All product_dimension.product_HCs	52,560.371	0.386	5,308
Singapore	All quarter_dimension.quarter_HCs	All retailer_dimension.retailer_HCs	All order_dimension.order_HCs	All product_dimension.product_HCs	45,386.63	0.448	3,420
Korea	All quarter_dimension.quarter_HCs	All retailer_dimension.retailer_HCs	All order_dimension.order_HCs	All product_dimension.product_HCs	46,654.297	0.447	3,373
China	All quarter_dimension.quarter_HCs	All retailer_dimension.retailer_HCs	All order_dimension.order_HCs	All product_dimension.product_HCs	68,134.589	0.409	3,639
Australia	All quarter_dimension.quarter_HCs	All retailer_dimension.retailer_HCs	All order_dimension.order_HCs	All product_dimension.product_HCs	29,823.569	0.448	3,639
Netherlands	All quarter_dimension.quarter_HCs	All retailer_dimension.retailer_HCs	All order_dimension.order_HCs	All product_dimension.product_HCs	29,823.569	0.448	3,639

An interpretation of this could be that in Brazil the product “Course Pro Umbrella” provided an average revenue of 11,670.248 by all order methods in all retailer shops in all the quarters of a year provided in this dataset (Q1 2012 to Q3 2014).

Another report is following after changing the sequence of the columns:

quarter_HC	retailer_HC	country_HC	order_HC	product_HC	Revenue	Gross_Market	Quantity
All quarter_dimension.quarter_HC	All retailer_dimension.retailer_HC	All country_dimension.country_HC	All order_dimension.order_HC	All product_dimension.product_HC	42,639.192	0.412	87,894
	Outdoors Shop	All country_dimension.country_HC	All order_dimension.order_HC	All product_dimension.product_HC	49,965.664	0.43	25,304
	Golf Shop	All country_dimension.country_HC	All order_dimension.order_HC	All product_dimension.product_HC	47,162.212	0.467	8,663
	Department Store	All country_dimension.country_HC	All order_dimension.order_HC	All product_dimension.product_HC	35,783.974	0.291	18,336
	Warehouse Store	All country_dimension.country_HC	All order_dimension.order_HC	All product_dimension.product_HC	38,187.758	0.422	4,970
	Eyewear Store	All country_dimension.country_HC	All order_dimension.order_HC	All product_dimension.product_HC	29,900.428	0.443	5,743
	Sports Store	All country_dimension.country_HC	All order_dimension.order_HC	All product_dimension.product_HC	47,776.145	0.446	20,125
			Fax	All product_dimension.product_HC	21,641.559	0.47	533
			Telephone	All product_dimension.product_HC	26,106.366	0.446	990
			Mail	All product_dimension.product_HC	23,771.283	0.449	125
			Web	All product_dimension.product_HC	53,450.167	0.445	15,894
			Sales visit	All product_dimension.product_HC	28,525.397	0.444	1,495
			Special	All product_dimension.product_HC	17,777.544	0.437	43
			E-mail	All product_dimension.product_HC	27,955.689	0.45	1,045
	Direct Marketing	All country_dimension.country_HC	All order_dimension.order_HC	All product_dimension.product_HC	17,336.648	0.515	3,118
	Equipment Rental Store	All country_dimension.country_HC	All order_dimension.order_HC	All product_dimension.product_HC	26,040.988	0.442	1,635

Here we notice that in Sports stores 533 units were ordered by fax, while 990 were by telephone. Both of these cases regard all products in all countries for all of the time quarters collected in this dataset.

Another one is presented below:

quarter_HC	retailer_HC	country_HC	order_HC	product_HC	Revenue	Gross_Market	Quantity
All quarter_dimension.quarter_HC	All retailer_dimension.retailer_HC	All country_dimension.country_HC	All order_dimension.order_HC	All product_dimension.product_HC	29,355.239	0.447	3,823
	Outdoors Shop	All country_dimension.country_HC	All order_dimension.order_HC	All product_dimension.product_HC	38,485.844	0.447	3,984
		Italy	All order_dimension.order_HC	All product_dimension.product_HC	38,450.167	0.341	5,537
		Spain	All order_dimension.order_HC	All product_dimension.product_HC	49,965.664	0.43	25,304
		United States	All order_dimension.order_HC	All product_dimension.product_HC	101,924.797	0.439	2,194
		Canada	All order_dimension.order_HC	All product_dimension.product_HC	41,649.168	0.439	2,009
		Mexico	All order_dimension.order_HC	All product_dimension.product_HC	40,093.963	0.436	1,147
		Brazil	All order_dimension.order_HC	All product_dimension.product_HC	37,958.125	0.436	946
		Japan	All order_dimension.order_HC	All product_dimension.product_HC	88,996.421	0.431	1,181
		Singapore	All order_dimension.order_HC	All product_dimension.product_HC	50,661.114	0.434	1,328
		China	All order_dimension.order_HC	All product_dimension.product_HC	84,701.314	0.336	1,316
		Australia	All order_dimension.order_HC	All product_dimension.product_HC	34,385.377	0.437	1,229
		Netherlands	All order_dimension.order_HC	All product_dimension.product_HC	42,659.131	0.432	1,207
		Sweden	All order_dimension.order_HC	All product_dimension.product_HC	26,235.301	0.432	975
		Denmark	All order_dimension.order_HC	All product_dimension.product_HC	21,208.333	0.435	549
		Finland	All order_dimension.order_HC	All product_dimension.product_HC	48,509.587	0.439	1,001
		France	All order_dimension.order_HC	All product_dimension.product_HC	48,567.566	0.433	1,587
		Germany	All order_dimension.order_HC	All product_dimension.product_HC	44,099.341	0.436	1,530
		Switzerland	All order_dimension.order_HC	All product_dimension.product_HC	31,698.957	0.438	829
		United Kingdom	All order_dimension.order_HC	All product_dimension.product_HC	48,678.919	0.436	1,569
		Belgium	All order_dimension.order_HC	All product_dimension.product_HC	25,955.471	0.433	1,135
		Austria	All order_dimension.order_HC	All product_dimension.product_HC	27,896.743	0.437	1,318
		Italy	All order_dimension.order_HC	All product_dimension.product_HC	51,990.859	0.437	1,151
		Spain	All order_dimension.order_HC	All product_dimension.product_HC	49,965.664	0.43	25,304

Here one could notice that, in the United States the Outdoor shops made an average revenue of 101,924.797 while the same type of shops made an average of 41,649.168 in Canada and 40,093.963 in Mexico.

Another report screenshot is shown below after changing the sequence of the columns:

The screenshot shows a Jpivot report with the following dimensions and measures:

product_HC	order_HC	quarter_HC	country_HC	retailer_HC	Measures
					Revenue • Gross_Market • Quantity
All product_dimension.product_HC	All order_dimension.order_HC	All quarter_dimension.quarter_HC	All country_dimension.country_HC	All retailer_dimension.retailer_HC	42,639.192 0.412 87,894
Camping Equipment	All order_dimension.order_HC	All quarter_dimension.quarter_HC	All country_dimension.country_HC	All retailer_dimension.retailer_HC	50,513.671 0.413 24,715
Mountaineering Equipment	All order_dimension.order_HC	All quarter_dimension.quarter_HC	All country_dimension.country_HC	All retailer_dimension.retailer_HC	51,575.106 0.419 7,939
Personal Accessories	All order_dimension.order_HC	All quarter_dimension.quarter_HC	All country_dimension.country_HC	All retailer_dimension.retailer_HC	38,033.586 0.363 39,253
Fax	All order_dimension.order_HC	All quarter_dimension.quarter_HC	All country_dimension.country_HC	All retailer_dimension.retailer_HC	13,279.716 0.439 497
Telephone	All order_dimension.order_HC	All quarter_dimension.quarter_HC	All country_dimension.country_HC	All retailer_dimension.retailer_HC	15,797.609 0.349 1,741
Mail	All order_dimension.order_HC	All quarter_dimension.quarter_HC	All country_dimension.country_HC	All retailer_dimension.retailer_HC	16,174.514 0.441 177
Web	All order_dimension.order_HC	All quarter_dimension.quarter_HC	All country_dimension.country_HC	All retailer_dimension.retailer_HC	10,848.724 0.433 153
Sales visit	All order_dimension.order_HC	All quarter_dimension.quarter_HC	All country_dimension.country_HC	All retailer_dimension.retailer_HC	14,045.418 0.015 360
Special	All order_dimension.order_HC	All quarter_dimension.quarter_HC	All country_dimension.country_HC	All retailer_dimension.retailer_HC	25,385.538 0.363 65
E-mail	All order_dimension.order_HC	All quarter_dimension.quarter_HC	All country_dimension.country_HC	All retailer_dimension.retailer_HC	19,817.654 0.465 172
Outdoor Protection	All order_dimension.order_HC	All quarter_dimension.quarter_HC	All country_dimension.country_HC	All retailer_dimension.retailer_HC	15,622.716 0.427 399
Golf Equipment	All order_dimension.order_HC	All quarter_dimension.quarter_HC	All country_dimension.country_HC	All retailer_dimension.retailer_HC	13,278.151 0.461 22
					11,941.643 0.467 3
					12,747.565 0.457 271
					41,268.243 0.372 24,091
					17,523.417 0.329 1,549
					12,701.323 0.442 132
					20,381.855 0.051 972
					4,624.503 0.535 8,354
					73,785.41 0.513 7,633

Slicer:
 Jpivot is a community plug-in that has been provided for your convenience. If you are a Pentaho customer we encourage you to transition current Analysis Views to Pentaho Analyzer.

Here an interpretation could be that 172 units in the “Personal Accessories” type of product were ordered by telephone in Eyewear stores in all quarters in all countries in this dataset, while in Department stores this number is 360.

Added to that another report is presented below:

The screenshot shows a Jpivot report with the following dimensions and measures:

product_HC	order_HC	quarter_HC	country_HC	retailer_HC	Measures
					Revenue • Gross_Market • Quantity
All product_dimension.product_HC	All order_dimension.order_HC	All quarter_dimension.quarter_HC	All country_dimension.country_HC	All retailer_dimension.retailer_HC	42,639.192 0.412 87,894
Camping Equipment	All order_dimension.order_HC	All quarter_dimension.quarter_HC	All country_dimension.country_HC	All retailer_dimension.retailer_HC	50,513.671 0.413 24,715
Mountaineering Equipment	All order_dimension.order_HC	All quarter_dimension.quarter_HC	All country_dimension.country_HC	All retailer_dimension.retailer_HC	51,575.106 0.419 7,939
Rope	All order_dimension.order_HC	All quarter_dimension.quarter_HC	All country_dimension.country_HC	All retailer_dimension.retailer_HC	73,728.508 0.314 1,552
Safety	All order_dimension.order_HC	All quarter_dimension.quarter_HC	All country_dimension.country_HC	All retailer_dimension.retailer_HC	54,941.838 0.375 1,515
Climbing Accessories	All order_dimension.order_HC	All quarter_dimension.quarter_HC	All country_dimension.country_HC	All retailer_dimension.retailer_HC	30,316.829 0.51 2,671
Tools	All order_dimension.order_HC	All quarter_dimension.quarter_HC	All country_dimension.country_HC	All retailer_dimension.retailer_HC	59,472.977 0.413 2,201
		2012	All country_dimension.country_HC	All retailer_dimension.retailer_HC	38,928.036 0.404 875
		2013	All country_dimension.country_HC	All retailer_dimension.retailer_HC	67,171.634 0.419 778
		Q1 2013	All country_dimension.country_HC	All retailer_dimension.retailer_HC	60,029.041 0.408 198
				Outdoors Shop	65,469.204 0.422 166
				Department Store	75,612.735 0.42 6
				Equipment Rental Store	21,699.457 0.32 26
		Q2 2013	All country_dimension.country_HC	All retailer_dimension.retailer_HC	68,677.195 0.423 202
		Q3 2013	All country_dimension.country_HC	All retailer_dimension.retailer_HC	69,712.775 0.426 193
		Q4 2013	All country_dimension.country_HC	All retailer_dimension.retailer_HC	70,521.2 0.42 185
		2014	All country_dimension.country_HC	All retailer_dimension.retailer_HC	81,347.552 0.42 548
Personal Accessories	All order_dimension.order_HC	All quarter_dimension.quarter_HC	All country_dimension.country_HC	All retailer_dimension.retailer_HC	38,033.586 0.363 39,253
Outdoor Protection	All order_dimension.order_HC	All quarter_dimension.quarter_HC	All country_dimension.country_HC	All retailer_dimension.retailer_HC	4,624.503 0.535 8,354
Golf Equipment	All order_dimension.order_HC	All quarter_dimension.quarter_HC	All country_dimension.country_HC	All retailer_dimension.retailer_HC	73,785.41 0.513 7,633

Slicer:
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Here it could be noticed that the product line “Tools”(falling in the product type Mountaineering Equipment) in the 3rd quarter of 2013,in all countries and by all order methods, provided an average revenue of 69,469.204 in Outdoor shops, while in Equipment Rental stores an average of 21,699.457.

Thank you for your time.