Sri Lanka Institute of Information Technology

IT3021 - Data Warehouse and Business Intelligence

Assignment 2

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Contents

1. DATA SOURCE

Data Warehouse implemented in the previous assignment was used as the source to complete Assignment 1. As described in the Assignment 1, the selected data set consisted of transactional data. Advertising car information, catalog information, information about car sales, information related to the ad to be published are some of the key information included in the database.

ER - Diagram
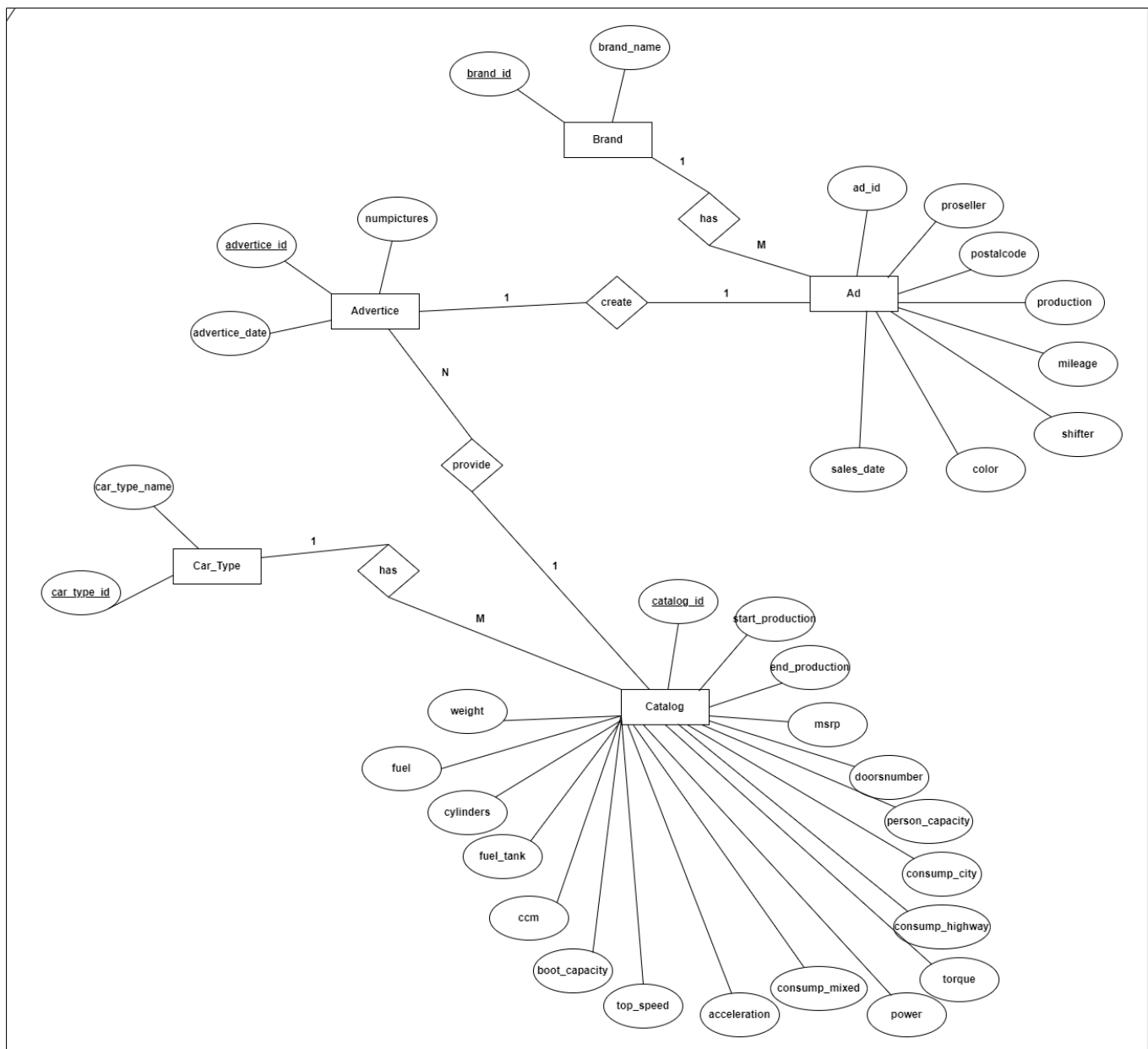
2. SSAS CUBE IMPLEMENTATION

1) A new SSAS project was created and named as **Car_Market_SSAS**, to begin the SSAS cube implementation. First the created Data warehouse was added as a new Data source and configured
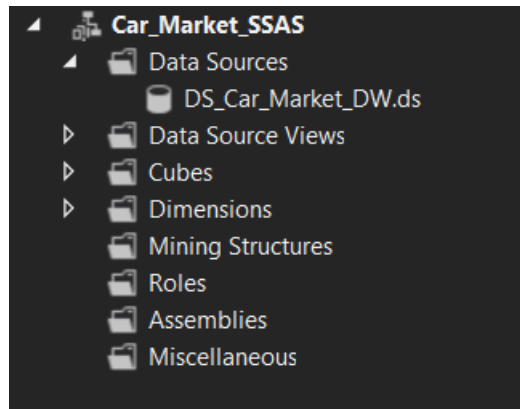
2) Next a new Data Source view was added after adding the same warehouse. In adding the Data source view, first the Fact table was selected and the other tables connected to the fact table was added by clicking on Add Related Tables. The created data source view is attached below
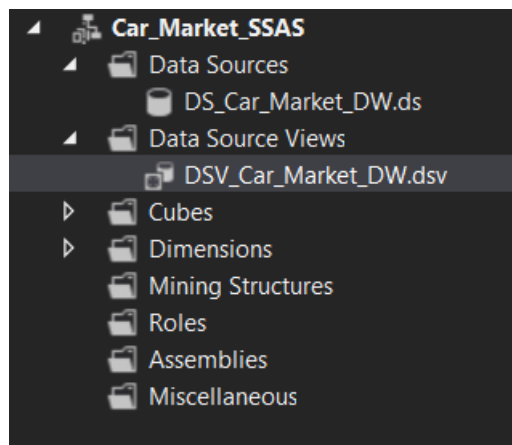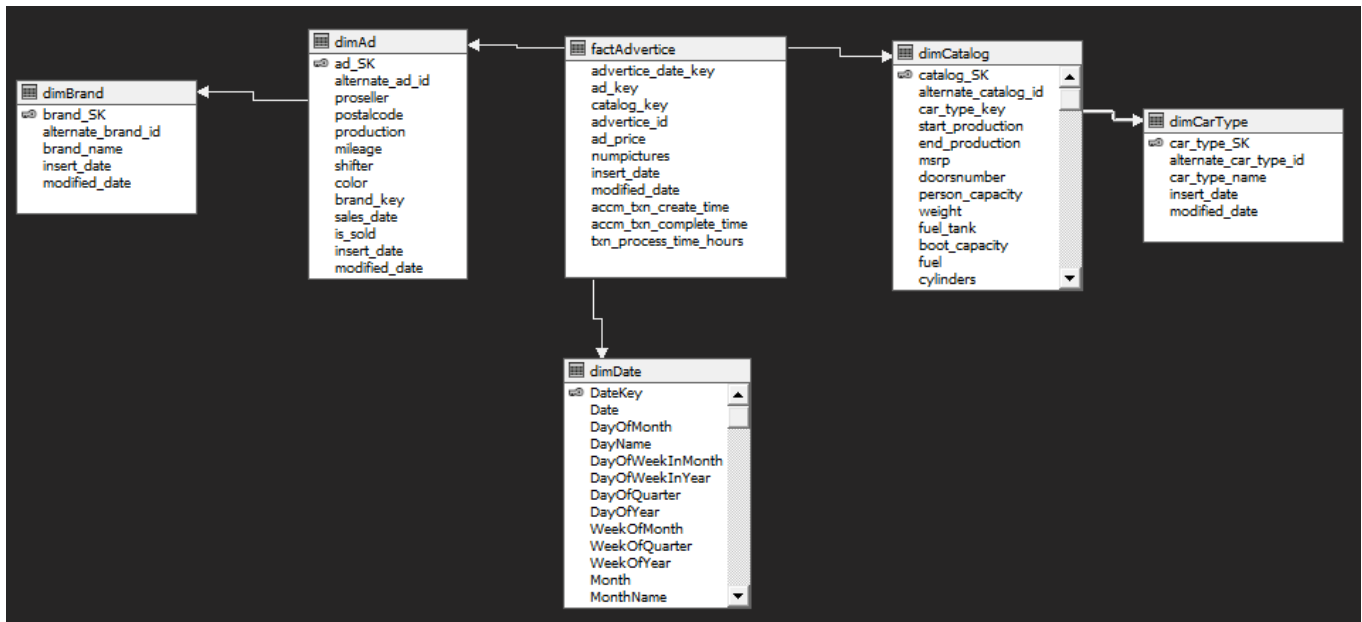
3) Next a cube was created by adding a new cube and selecting the fact table, measures, dimensions appropriately. The created cube is demonstrated below
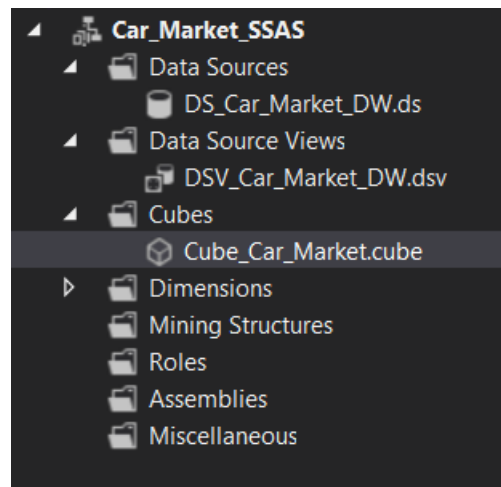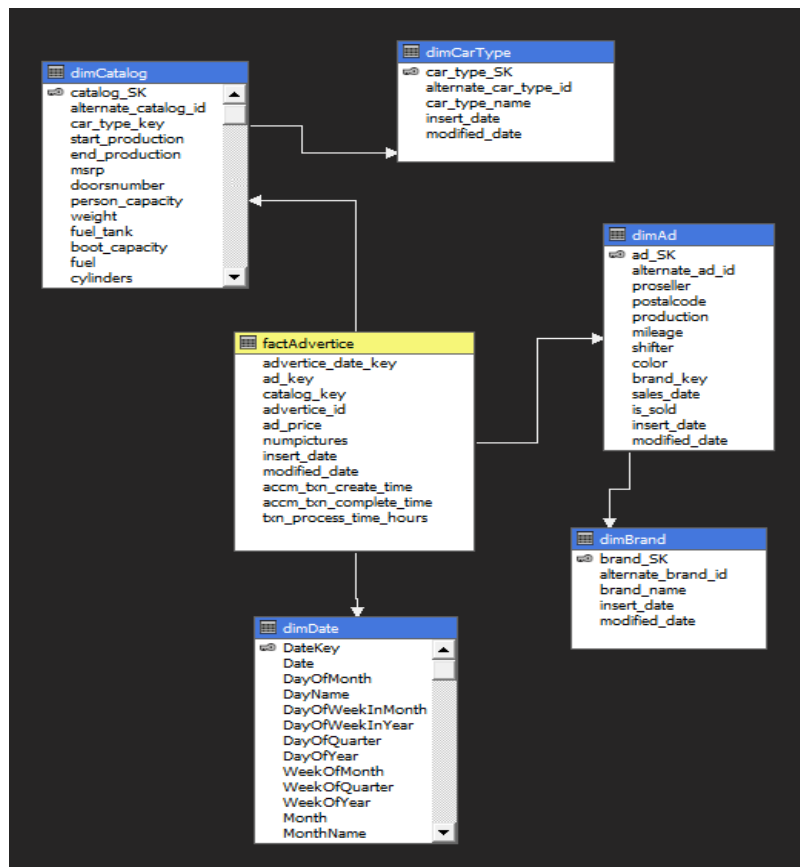
4) Next attributes were added to the relevant dimensions.

Catalog Dimension
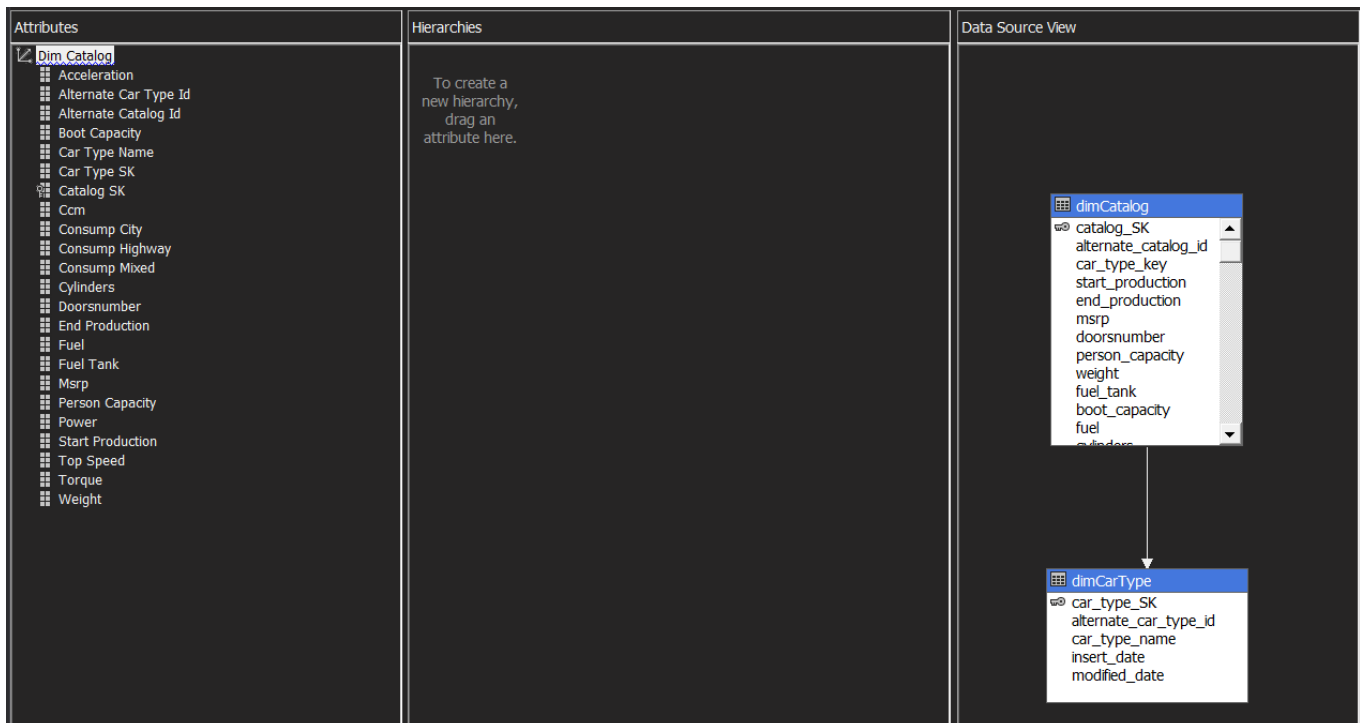
Advertisement Dimension
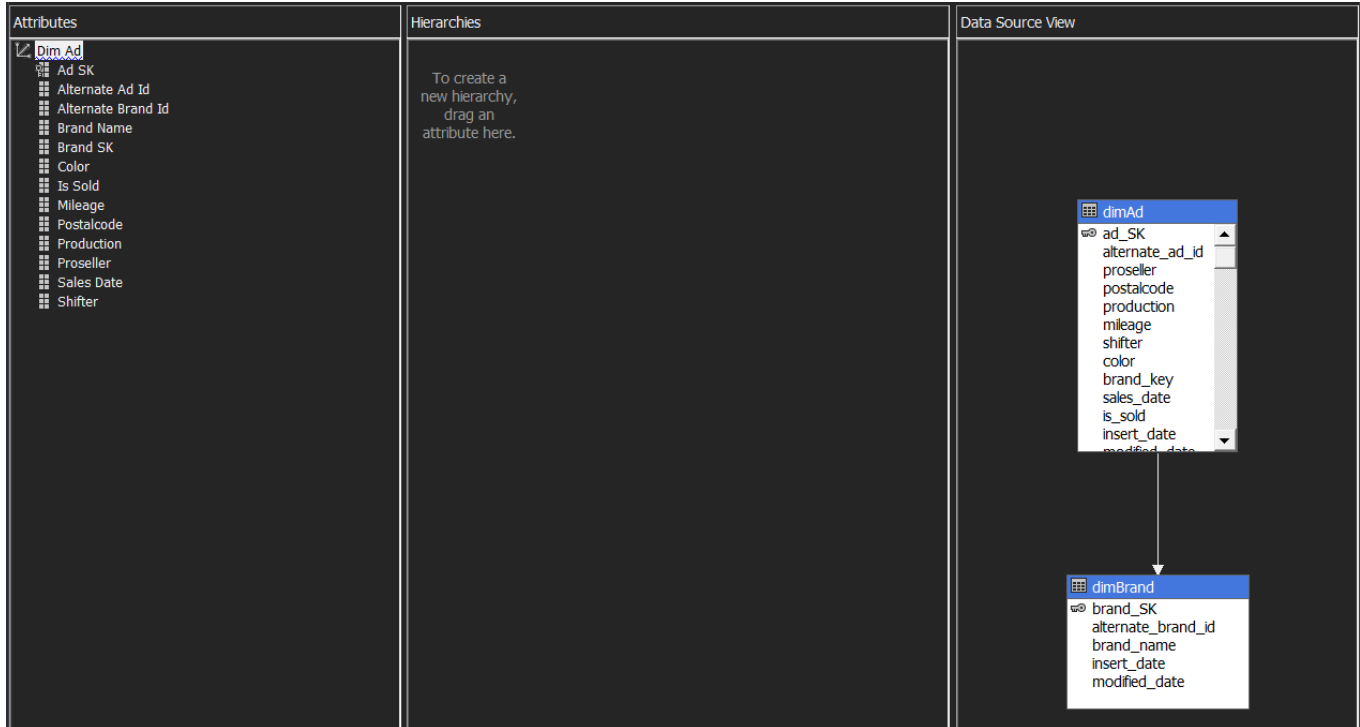
Date Dimension - Date dimension includes hierarchy with year, month and date attributes.
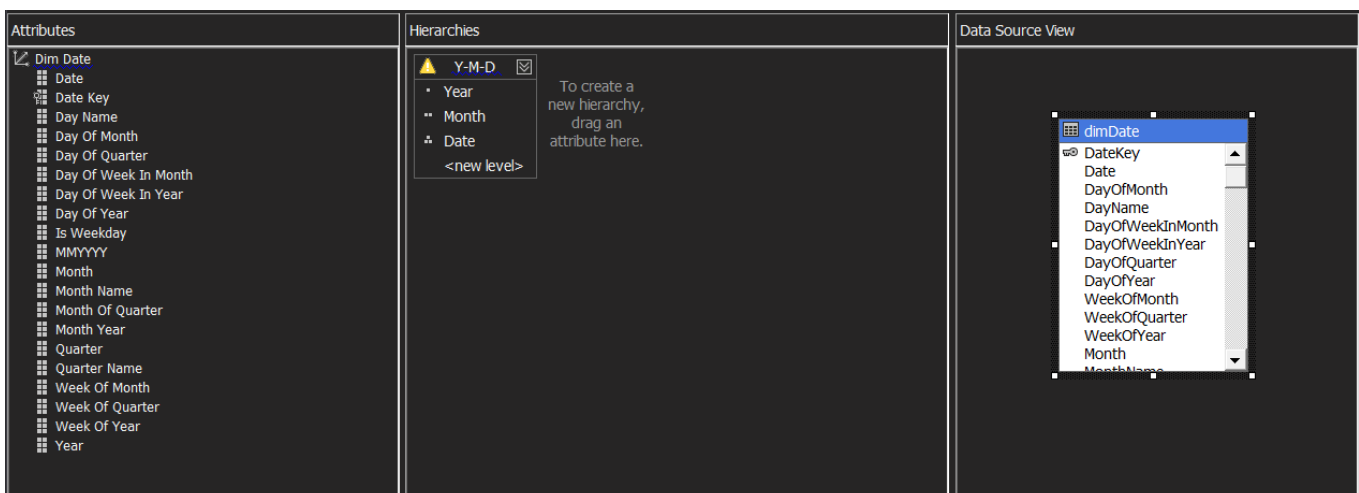
5) As the next step a role was created by defining permissions assigned to the role. The particular role has full control

6) As the last step of cube implementation, the cube was deployed.
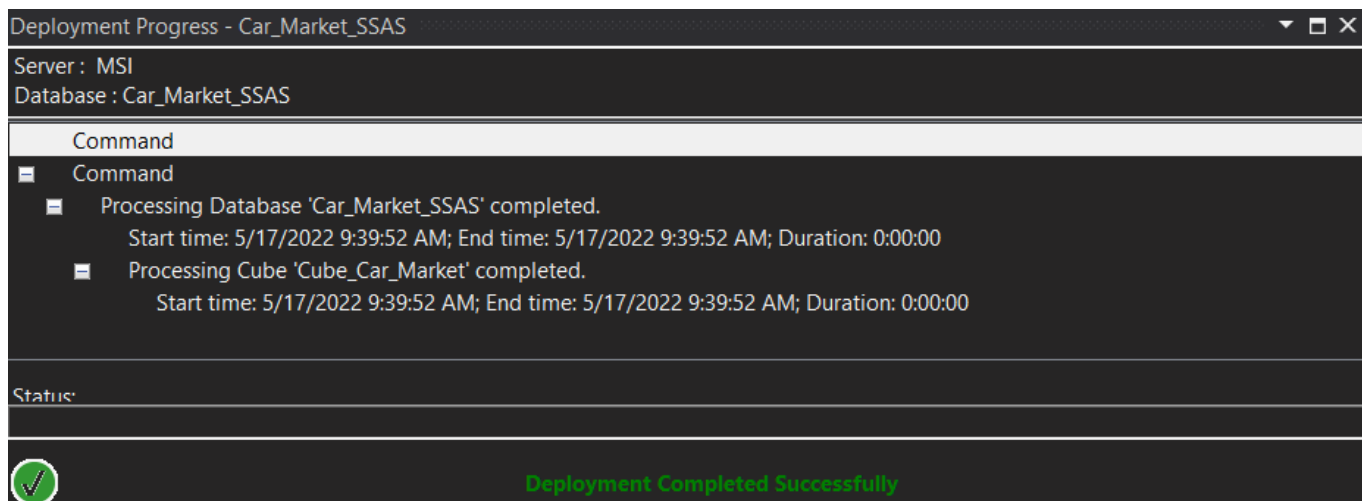
3. DEMONSTRATION OF OLAP OPERATIONS

After deployment the created cube is shown in the SQL Server Management Studio. By dragging and dropping the necessary fields the MDX queries were generated. And extracting the generated MDX queries to Excel power view, reports were created. The created reports using power pivot table are described below
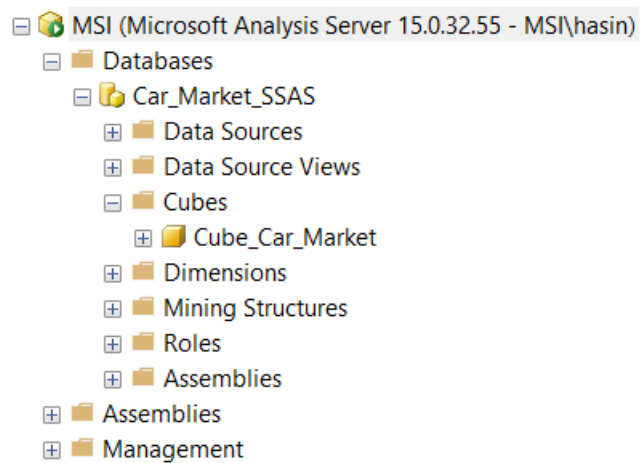
I. Operation 1 - Report with matrix

In here climbing up to the hierachy, I used the car advertisement and catalog details. In the case It has Brand name → Car type. But that two attributes in two dimension tables. Based on that hierachy it calculated total number of advertisements. In here I used pie chart to demonstrate the data.

Row Labels	Advertisement Count
⊞ AUDI	2105
⊞ BENTLEY	4
⊞ BMW	2940
⊞ CHEVROLET	381
⊞ CHRYSLER	120
⊞ DODGE	72
⊞ FORD	3513
⊞ HONDA	767
⊞ HYUNDAI	901
⊞ ISUZU	7
⊞ JAGUAR	90
⊞ JEEP	163
⊞ KIA	836
⊞ MAZDA	1219
⊞ MERCEDES-BENZ	2552
⊞ MITSUBISHI	492
⊞ NISSAN	1079
⊞ ROLLS-ROYCE	4
⊞ SUBARU	116
⊞ SUZUKI	1402
⊞ TOYOTA	1644
⊞ VOLKSWAGEN	3347
⊞ VOLVO	808
Grand Total	**24562**

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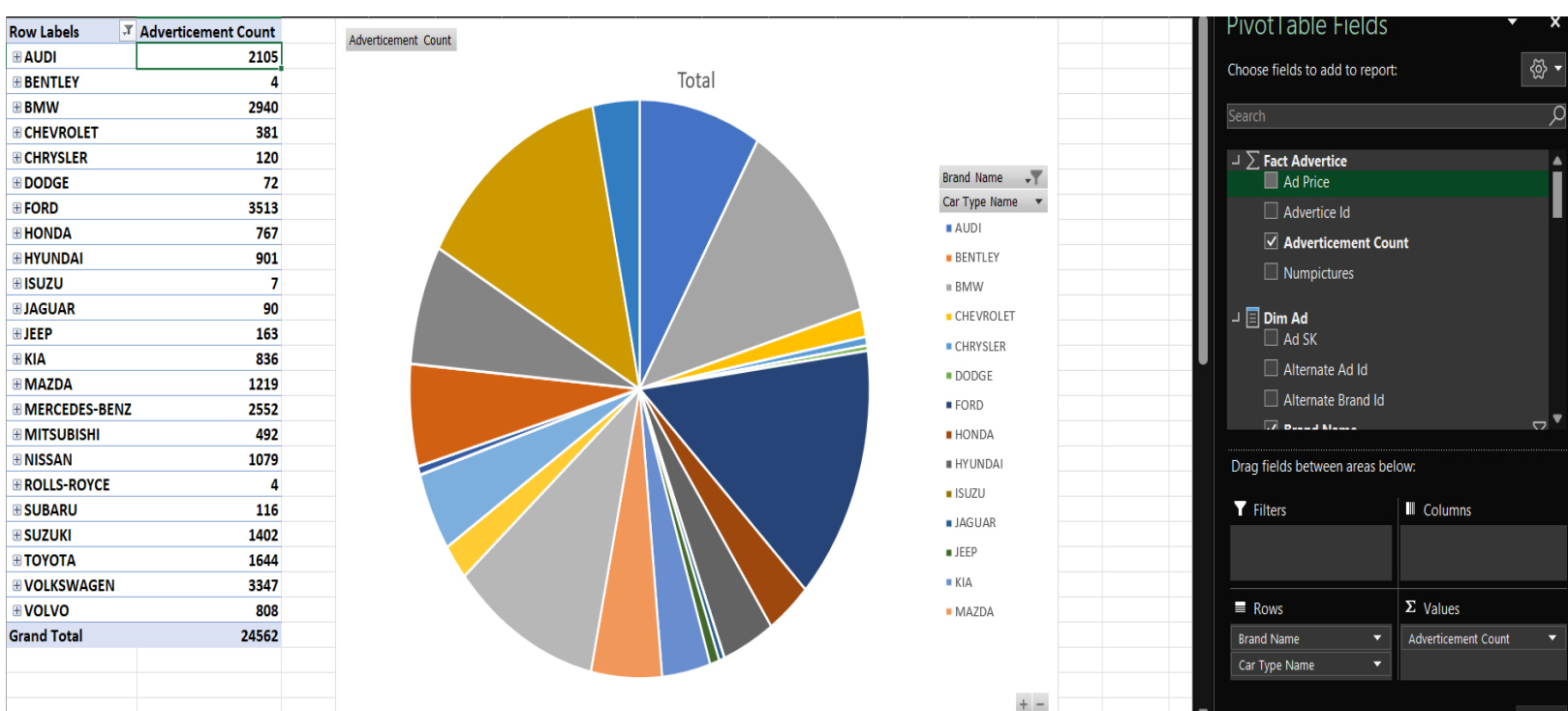
II. **Operation 2 - Roll up**

In here stepping down a hierarchy as mentioned earlier. After that that car types devied to the Fuel type. Brand name → Car type → Fuel type. Based on that hierachy it calculated counts of sold or not car advertisements. In here I used bar chart to demonstrate the data.

Adverticement Count	Is Sold		
Row Labels	FALSE	TRUE	Grand Total
☐ AUDI			
⊞ Cabrio	35	3	38
⊞ Closed	6	1	7
☐ Coupe			
Benzin	29	13	42
DÃfÂ-zel	6	1	7
⊞ Estate	437	48	485
⊞ Hatchback	583	77	660
☐ Minibus			
DÃfÂ-zel	8		8
⊞ Minivan	232	28	260
☐ Sedan			
Benzin	185	44	229
DÃfÂ-zel	117	21	138
☐ SUV			
Benzin	53		53
DÃfÂ-zel	134	44	178
⊞ BENTLEY	4		4
⊞ BMW	2492	448	2940
⊞ CHEVROLET	302	79	381
⊞ CHRYSLER	101	19	120
⊞ DODGE	71	1	72
⊞ FORD	2745	768	3513
⊞ HONDA	603	164	767
⊞ HYUNDAI	741	160	901
⊞ ISUZU	3	4	7

PivotTable Fields

III. Operation 3 – Slice

In here I choose advertisement count value from the fact advertise table and demostrate the slice operation. I used a bar chart to demonstrate the data. To slice I used shifter attribute from advertisement dimension for filter.
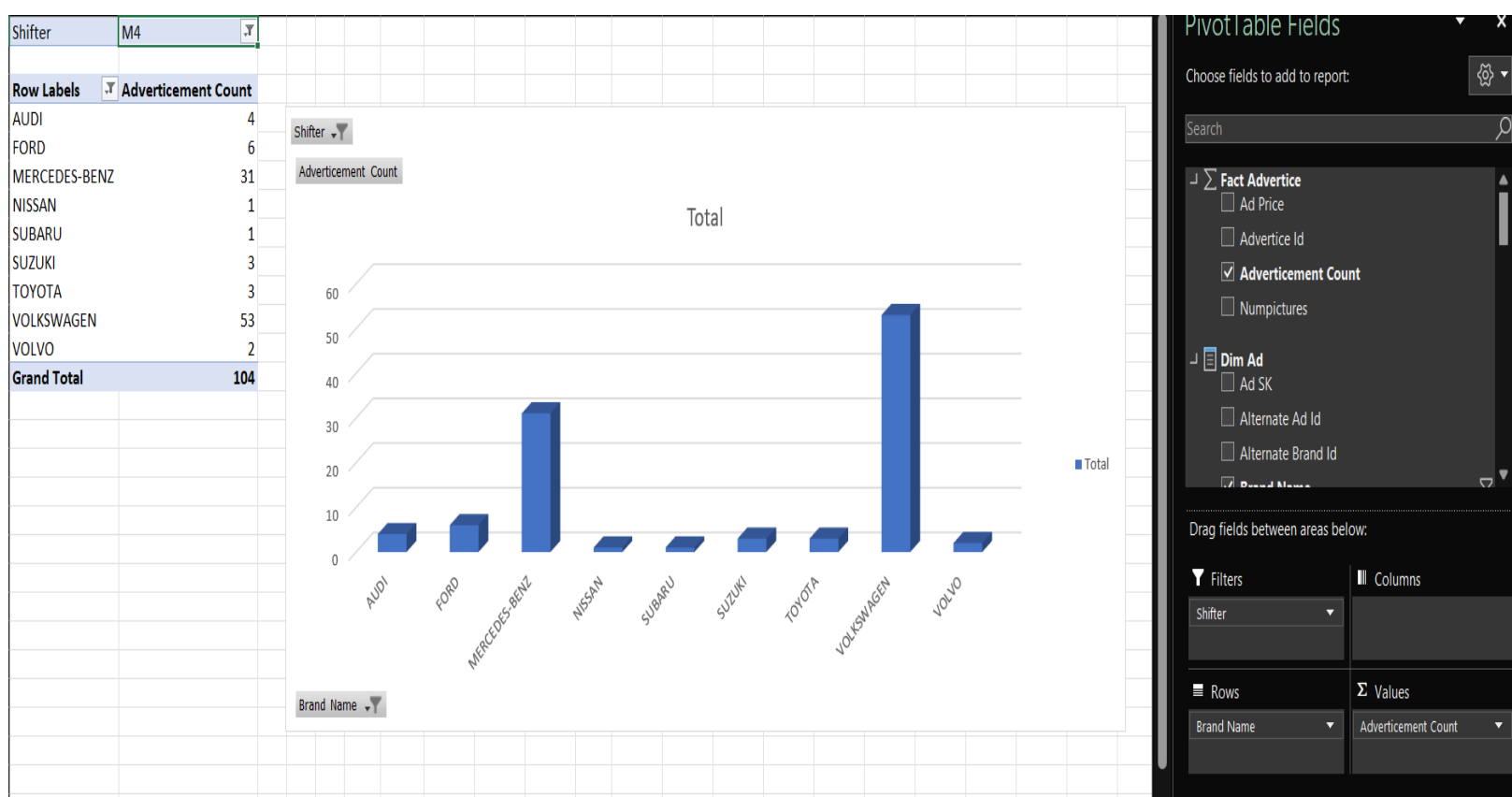
IV. Operation 4 - Dice

In here I select three dimension tables for Dice operation. Advertisement dimension, Catalog dimension and Date dimension. In here I used fuel type filter to demonstrate Dice operation. it calculated counts of car advertisements wise year. In here I used bar chart to demonstrate the data.

Fuel	Hibrid (Benzin)

Row Labels	Adverticement Count
⊟ AUDI	
2008	1
2010	3
⊞ BMW	2
⊞ FORD	5
⊟ HYUNDAI	
2008	1
⊞ KIA	1
⊞ MERCEDES-BENZ	3
⊞ NISSAN	2
⊞ SUBARU	1
⊞ SUZUKI	1
⊞ TOYOTA	2
⊞ VOLKSWAGEN	2
Grand Total	24
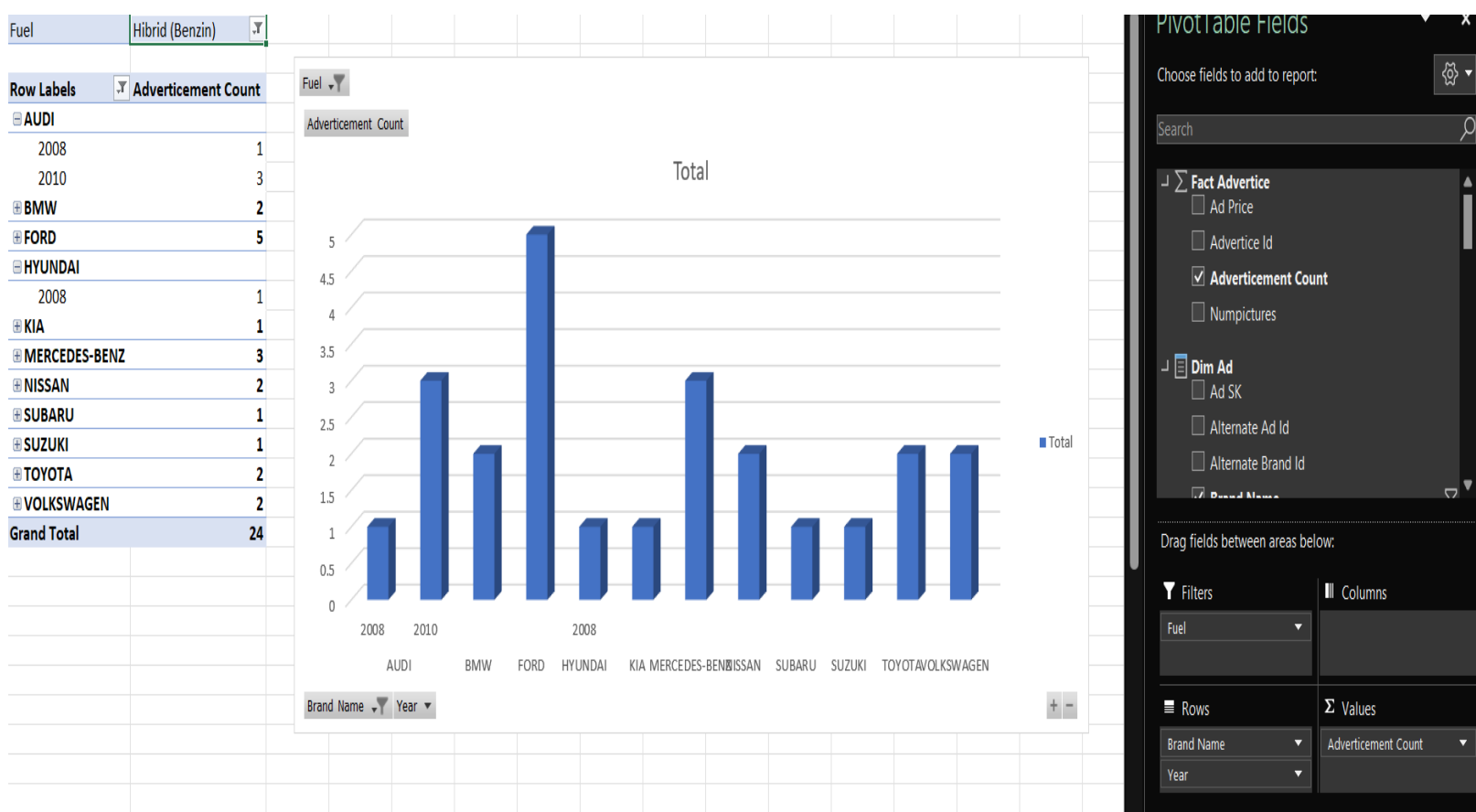
V. Operation 5 - Pivot

To represent the pivot, I used advertisement , catalog dimensions and fact advertise for measure values. In here vitualize the count of sold advertisements and count of sold car pictures wise fuel type. Using those values rotate the that two axes tp provide an alternative presentation of the data. In here I used bar chart to demonstrate the data.

Row Labels	Adverticement Count	Number of pictures
TRUE		
Benzin	4483	36062
Benzin/GÃƒÂ¡z	4	30
DÃƒÂ-zel	3509	28087
Elektromos	23	221
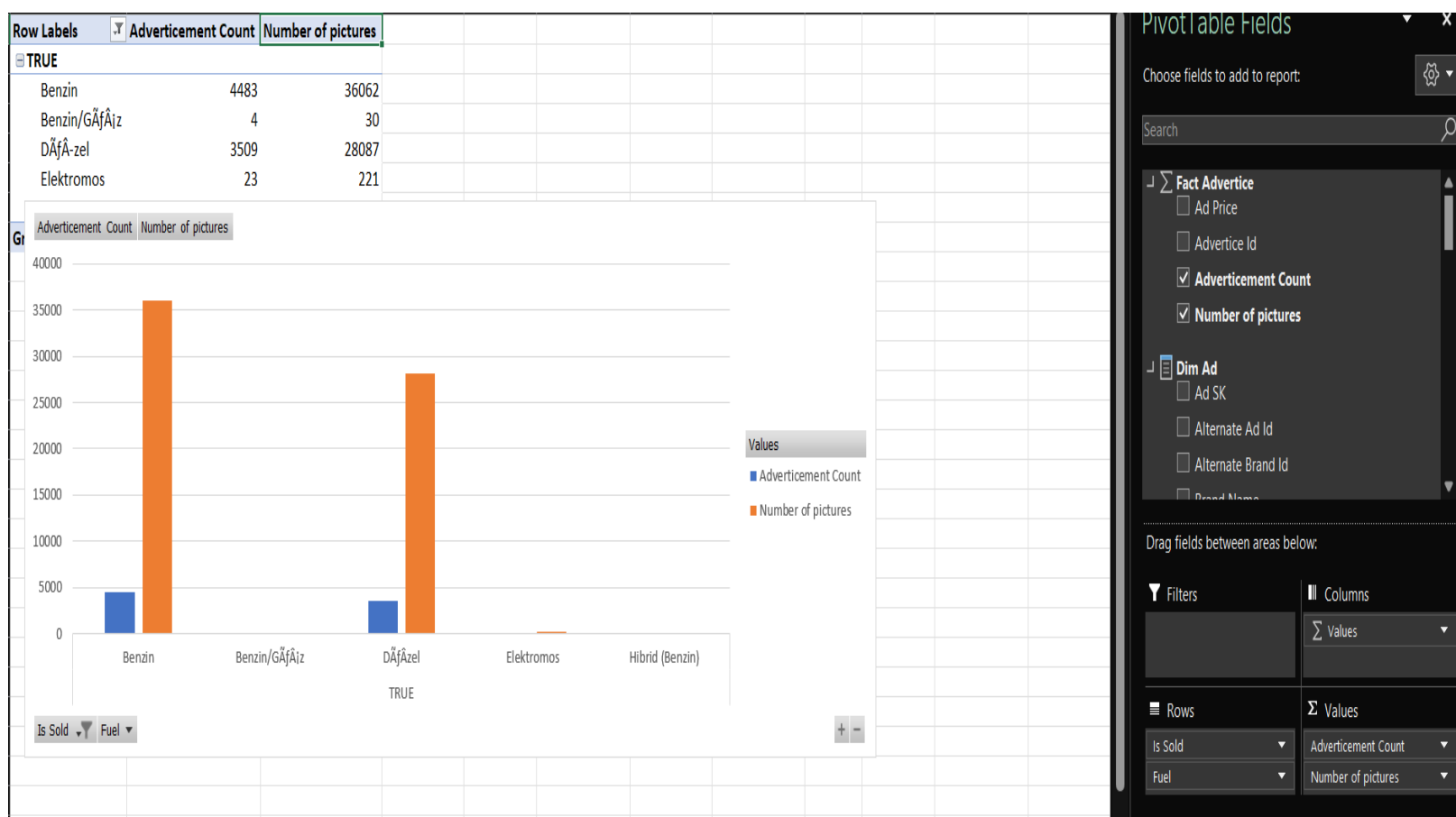
4. SSRS REPORTS

Before generating SSRS Reports, SQL Server Services Configuration manager was configured and the web portal was accessed using the URL mentioned below.

http://MSI:80/Reports
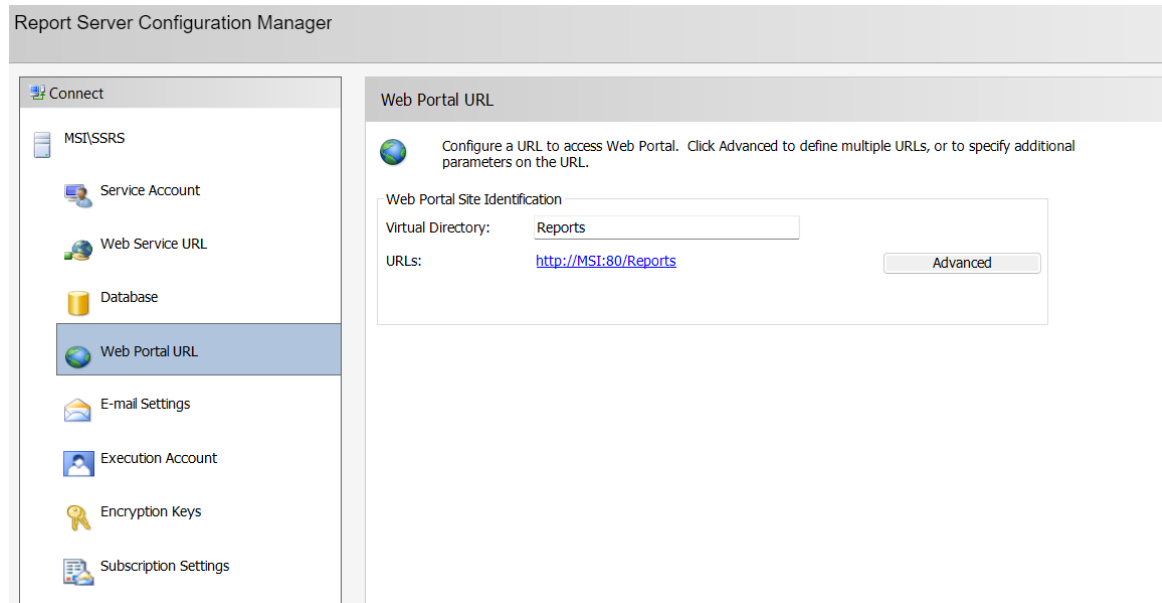
SSRS project was created by giving the server's name and SSAS in Report Builder

The Brand Wise car advertisement analysis report reflects number of pictures and advertisement prices monitored on a Brand basis. Total number of pictures, advertisement prices reflected car type wise

Brand wise YOY Car Advertisements Report

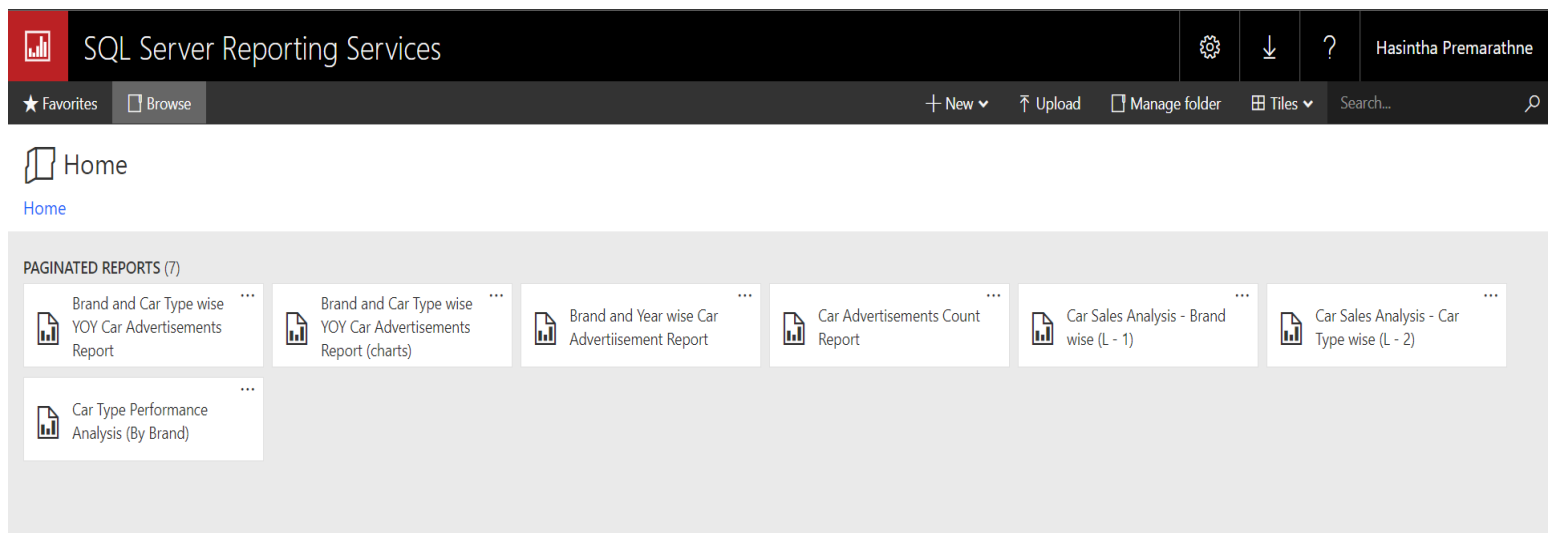| brand name	car type name	2004 numpictures	2004 ad price	2005 numpictures	2005 ad price	2006 numpictures	2006 ad price	2007 numpictures	2007 ad price	2008 numpictures	2008 ad price	2009 numpictures	2009 ad price
⊟ABARTH	Estate												
	Hatchback											18	17134000
	Minivan									7	1500000		
	Sedan												
	Total									7	1500000	18	17134000
⊟ACURA	Estate									12	9990000		
	Minivan											1	2200000
	SUV											1	2800000
	Total									12	9990000	2	5000000
⊞AIXAM	Total							10	549000			6	1400000
⊞ALFA ROMEO	Total					6	2955000	214	61176899	377	111336786	493	122976986
⊞ALPINA	Total									6	4999999		
⊞AMC	Total												
⊞ARO	Total											1	125000
⊞AUDI	Total					41	28267000	1258	687521699	2897	1646394241	3062	1756789907
⊞BARKAS	Total											0	1590000
⊞BENTLEY	Total							24	20800000			6	8499000

2013 numpictures	2013 ad price	2014 numpictures	2014 ad price	2015 numpictures	2015 ad price	2016 numpictures	2016 ad price	2017 numpictures	2017 ad price	2018 numpictures	2018 ad price	Total numpictures	Total ad price
6	2800000			8	3990000							72	46021999
												14	14990000
												27	3229000
232	71874999	243	73807899	173	43610989	179	29157999	85	52988999	38	9546000	2881	815488124
												6	4999999
11	1550000											11	1550000
												1	125000
1299	628095115	1152	679650228	1157	758019216	1048	562096620	582	356743903	199	124753000	18041	10402432454
												0	1590000
		12	9999999									42	39298999
				6	1350000							6	1350000
				10	1690000							10	1690000
2024	1384629984	1692	1106325321	1489	1071492869	1394	1020430687	991	625297797	261	136114100	25023	17154348463
8	6900000	12	1400000	9	1570000							49	20769000
		12	7999000	29	12499000	26	20000000			12	1990000	251	213223999
320	97992915	266	59607999	184	31290999	225	37524990	149	28836000	58	18386999	3191	747917475
97	13959000	65	11228000	58	6634000	63	12358000	30	3439999	9	298000	926	179121993
674	175628756	623	113781072	498	138582158	331	86429997	280	86706999	85	15614998	7885	1919389071

II. **Report 2 - Report with more than one parameter**

Brand and car type wise YOY car advertisements reports has more than 1 parameter. They are, Car brand name, car type and year. Those parameters contain listed values and user can select multiple values from the list. Total car prices and advertisement prices reflected Item brand wise. And also, there are some visualizations such as bar chart for the observations.

Car_Brand [AUDI,BMW] ⌄   Car_Type [Cabrio,Coupe,Hatchback] ⌄   Year [2012]

|◁   <   [1] of 1   >   ▷| ↻   ⊖   [100% ⌄]   🖫⌄   🖶   [   ] Find | Next

Brand and Car Type wise YOY Car Advertisements Report

		2012		Total	
brand name	**car type**	**msrp**	**ad price**	**msrp**	**ad price**
⊟AUDI	Cabrio	20003400	21040600	**20003400**	**21040600**
	Coupe	183309670	28687000	**183309670**	**28687000**
	Hatchback	297405780	321416876	**297405780**	**321416876**
	Total	500718850	371144476	500718850	371144476
⊟BMW	Cabrio	39137930	32044000	**39137930**	**32044000**
	Coupe	101740630	14458000	**101740630**	**14458000**
	Hatchback	419622200	524305568	**419622200**	**524305568**
	Total	560500760	570807568	560500760	570807568
Total		**1061219610**	**941952044**	**1061219610**	**941952044**

Car_Brand [BMW ⌄]   Year [2012]

|◁   <   [1] of 1   >   ▷| ↻   ⊖   [100% ⌄]   🖫⌄   🖶   [   ] Find | Next

Brand and Car Type wise YOY Car Advertisements Report

Chart Title

◼ Cabrio   ◼ Closed   ◼ Coupe   ◼ Estate   ◼ Hatchback   ◼ Minivan   ◼ Sedan   ◼ SUV
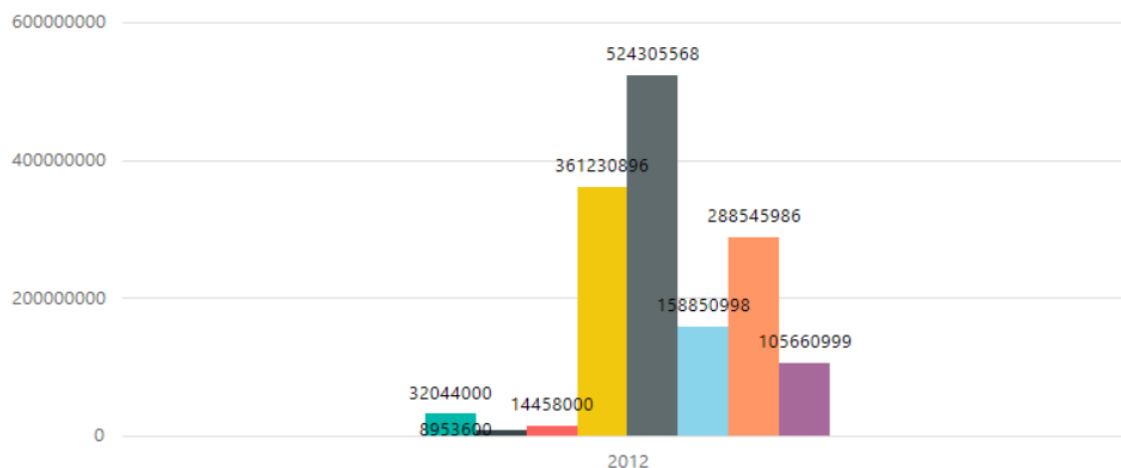
III. Report 3 - SSRS Drill - Down Report

The Car advertisement count analysis is the report with SSRS drill down. Details of the report can be drilled down to Brand name → Car type → Fuel type. This report helps to have an idea about the number of advertisements advertised wise year

Car Advertisements Count Report

brand name	car type name	fuel	2004	2005	2006	2007	2008	2009	2010
⊞ABARTH	Total		0	0	0	0	1	2	1
⊞ACURA	Total		0	0	0	0	1	2	0
⊞AIXAM	Total		0	0	0	1	0	1	0
⊞ALFA ROMEO	Total		0	0	1	27	49	63	46
⊞ALPINA	Total		0	0	0	0	1	0	0
⊞AMC	Total		0	0	0	0	0	0	0
⊞ARO	Total		0	0	0	0	0	1	0
⊞AUDI	Total		0	0	4	142	345	361	273
⊞BARKAS	Total		0	0	0	0	0	1	0
⊞BENTLEY	Total		0	0	0	2	0	1	0
⊞BERTONE	Total		0	0	0	0	0	0	0
⊞BIRDIE	Total		0	0	0	0	0	0	0
⊞BMW	Total		0	1	6	198	480	481	351
⊞BUICK	Total		0	0	0	0	1	0	0
⊞CADILLAC	Total		0	0	0	2	6	1	7
⊞CHEVROLET	Total		0	0	0	24	48	61	45
⊞CHRYSLER	Total		0	0	2	7	14	24	16

Car Advertisements Count Report

brand name	car type name	fuel	2004	2005	2006	2007	2008	2009	2010
⊟ABARTH	⊟Estate	Benzin	0	0	0	0	0	0	1
		DÃƒÂzel	0	0	0	0	0	0	0
		Total	0	0	0	0	0	0	1
	⊞Hatchback	Total	0	0	0	0	0	2	0
	⊞Minivan	Total	0	0	0	0	1	0	0
	⊞Sedan	Total	0	0	0	0	0	0	0
	Total		0	0	0	0	1	2	1
⊟ACURA	⊟Estate	DÃƒÂzel	0	0	0	0	1	0	0
		Total	0	0	0	0	1	0	0
	⊞Minivan	Total	0	0	0	0	0	1	0
	⊞SUV	Total	0	0	0	0	0	1	0
	Total		0	0	0	0	1	2	0
⊞AIXAM	Total		0	0	0	1	0	1	0
⊞ALFA ROMEO	Total		0	0	1	27	49	63	46
⊞ALPINA	Total		0	0	0	0	1	0	0
⊞AMC	Total		0	0	0	0	0	0	0
⊞ARO	Total		0	0	0	0	0	1	0

### IV. Report 4 - SSRS Drill - Through Report

This is report with SSRS drill-through. It reflects car brand vs advertisement count with advertisement prices and car type vs advertisement count with advertisement prices. The purpose of this task is to create a second level report. In order to do this, car brand sales analysis report allows user to click on car brand bars which is in charts. When clicked on a brand car, the user needs to be taken to a (second level) car type sales analysis report, where the advertisement count of car types and total advertisement prices of car types shown in the report and their car brand that belong to the selected brand in the first level report. Which means, by selecting particular car brand from first level report. we can view the advertisement count and their advertisement prices.

Car Brand Sales Analysis
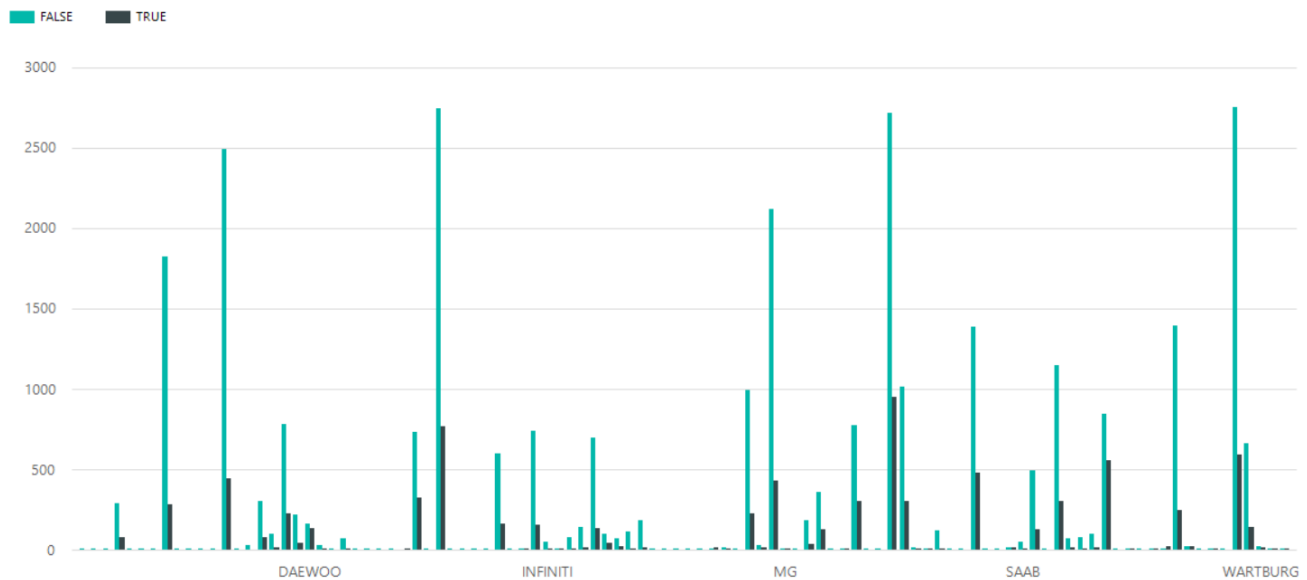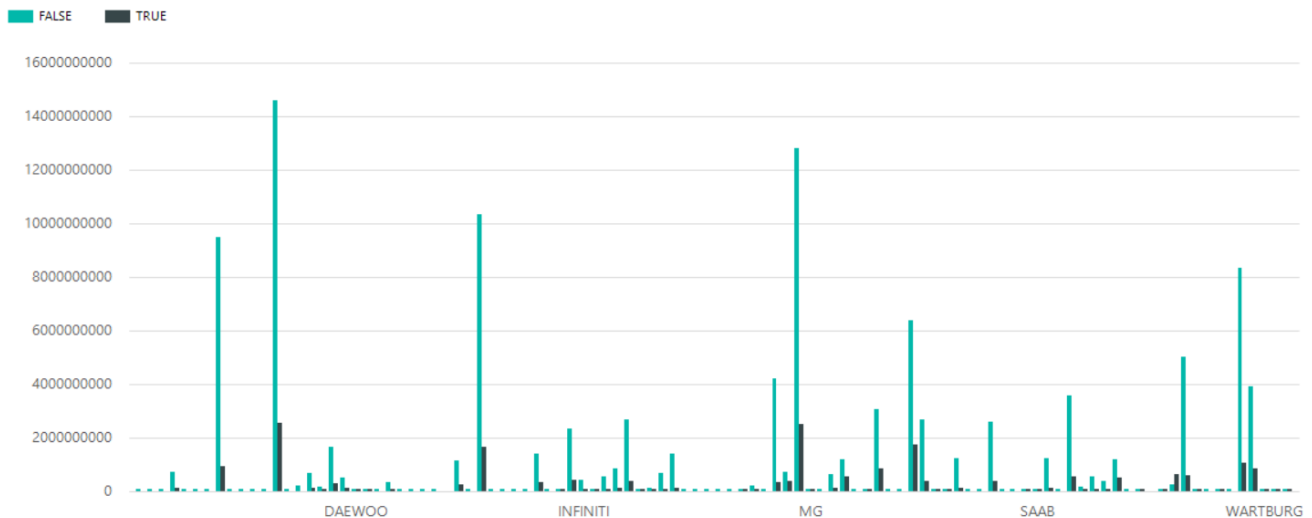
Car Type Sales Analysis

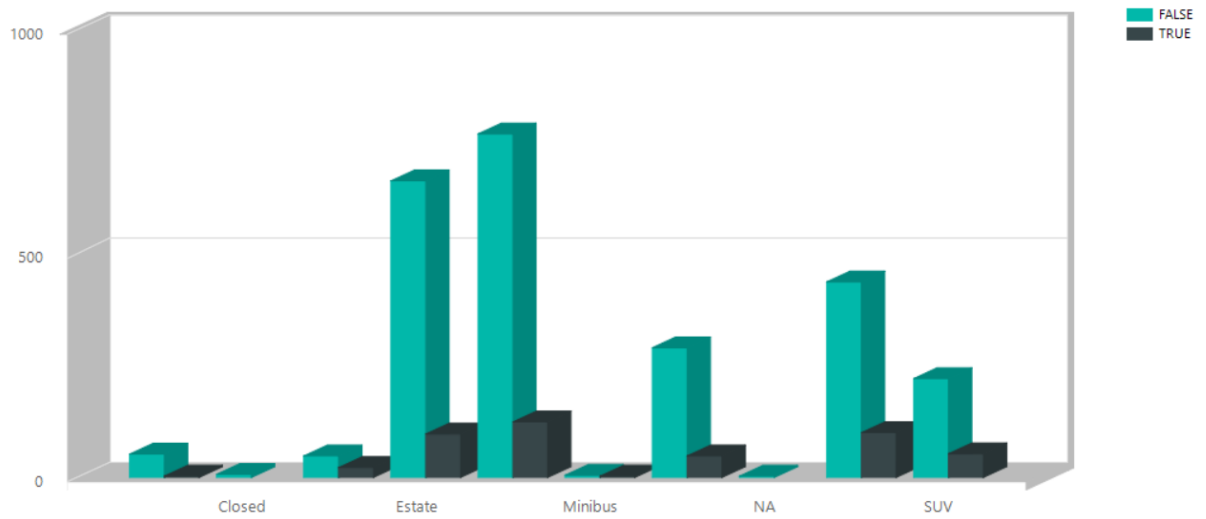**Car type-wise Advertisement Count**

Car Type-wise Advertisement Price

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