Sri Lanka Institute of Information Technology

Data Wearhouse and Business Intelligence

<u>Assignment 02</u>

Compiled by -
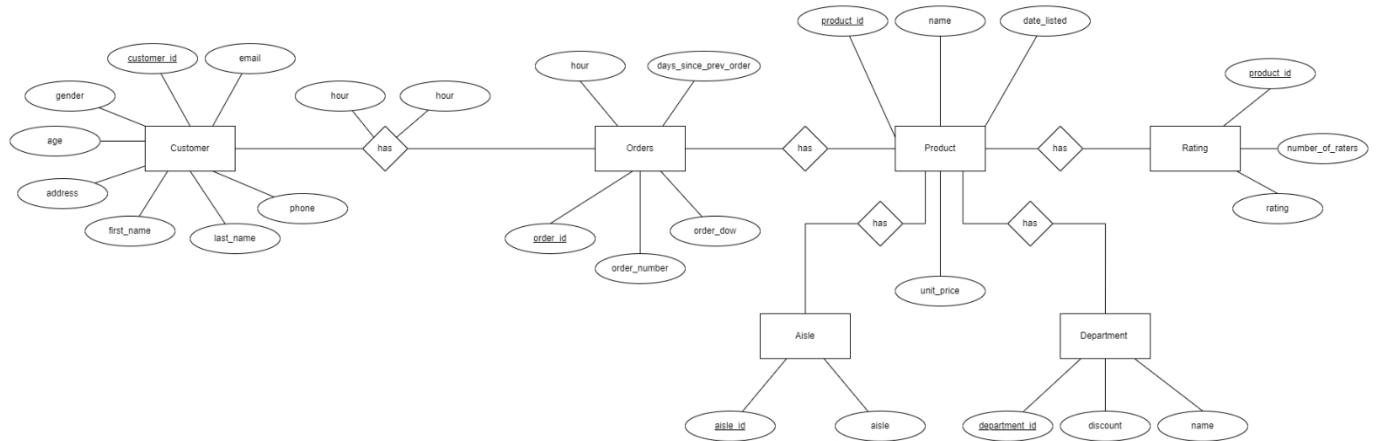
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Contents

1. Data source

Instacart dataset was used for this project. The dataset contains a sample of over 3 million grocery orders from more than 200,000 Instacart users. Customer, Orders, Products, Department, Aisle, and rating data was obtained as separate files. Following is the ER diagram of the dataset.


Summary of the dataset is as below,

| Source Type	Table Name	Colum Name	Data type	Description
CSV fille	dbo.Aisle	aisle_id aisle	numeric(18, 0) nvarchar(50)	Unique ID Aisle name
CSV fille	dbo.Department	department_id department discount	numeric(18, 0) nvarchar(50) int	Unique ID Department name Discount by department
CSV fille	dbo.Order	order_id user_id order_number order_dow order_hour_of_day days_since_prior_order order_date	numeric(18, 0) numeric(18, 0) numeric(18, 0) numeric(18, 0) numeric(18, 0) numeric(18, 0) datetime	Unique ID User ID Number assigned to order Day of the week Hour of the day Days since last order Orde date
CSV fille	dbo.Order_details	order_id product_id add_to_cart_order reordered	numeric(18, 0) numeric(18, 0) int int	Unique Order ID Product ID Add to cart or not Reordered or not
TXT file	dbo.Rating	product_id num_of_raters rating	numeric(18, 0) numeric(18, 0) numeric(18, 0)	Unique ID Rater count Rating

2. SSAS Cube implementation

2.1 Adding data source

SSAS cube was developed as a "Analysis Service Multidimensional and Data Mining " project on Visual Studio 2017. Datawarehouse was added as the Data source.
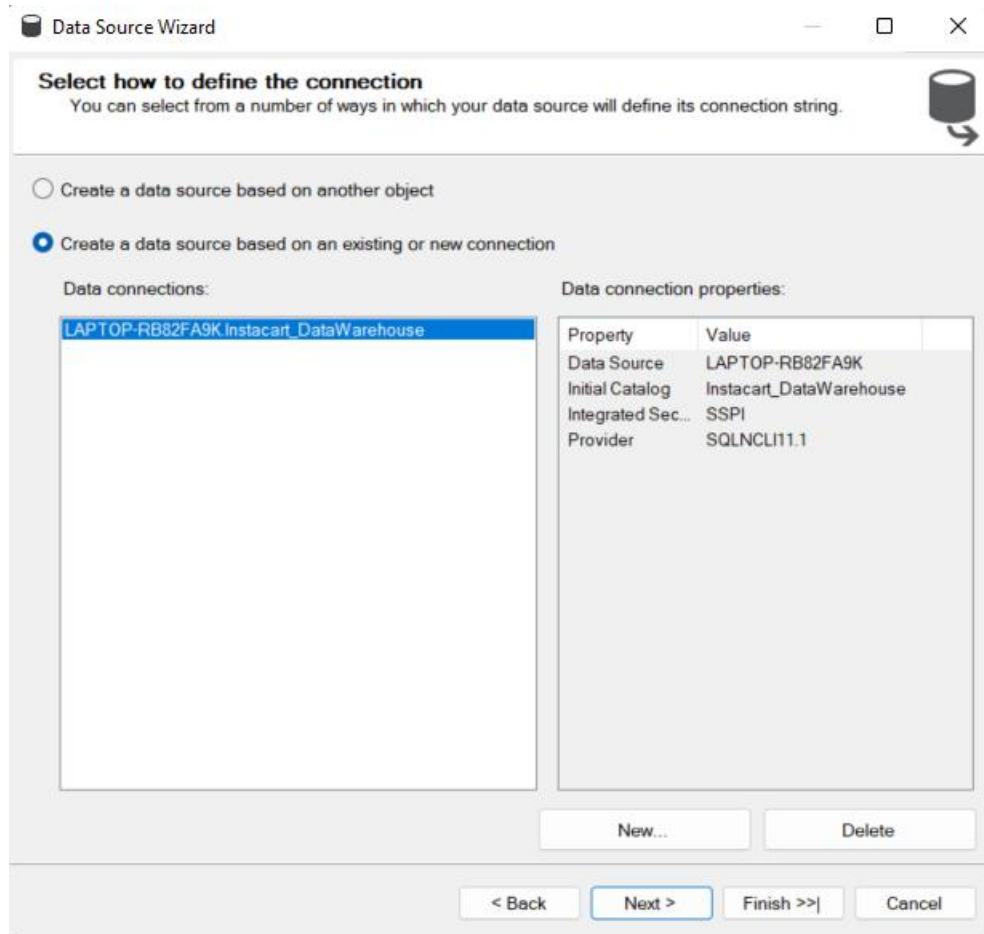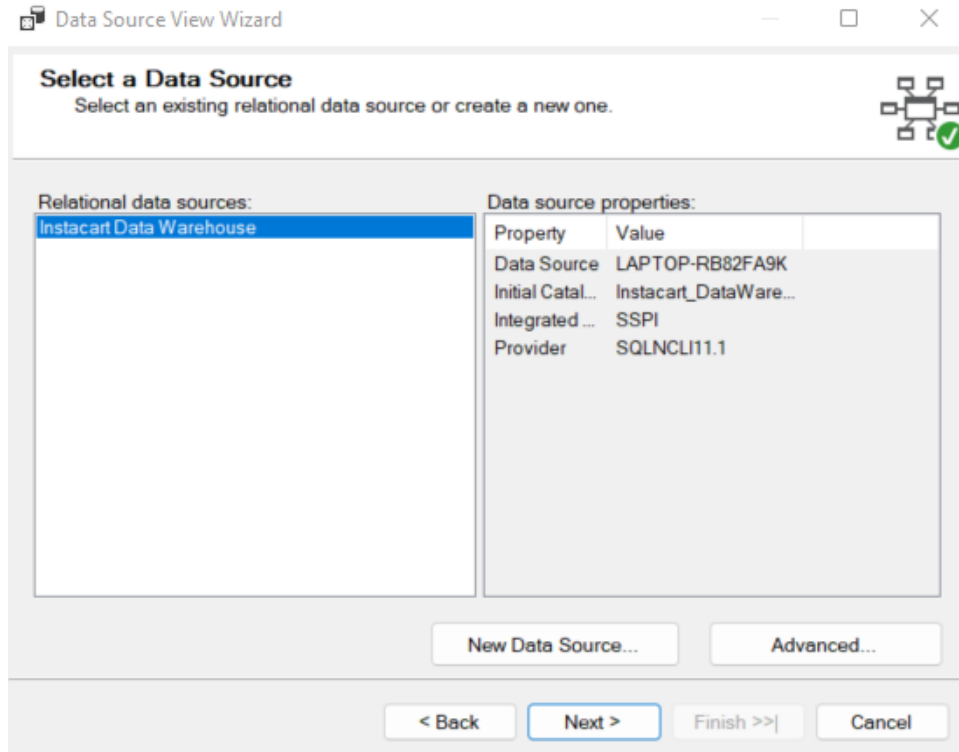
All tables from the data warehouse were added to data source view.
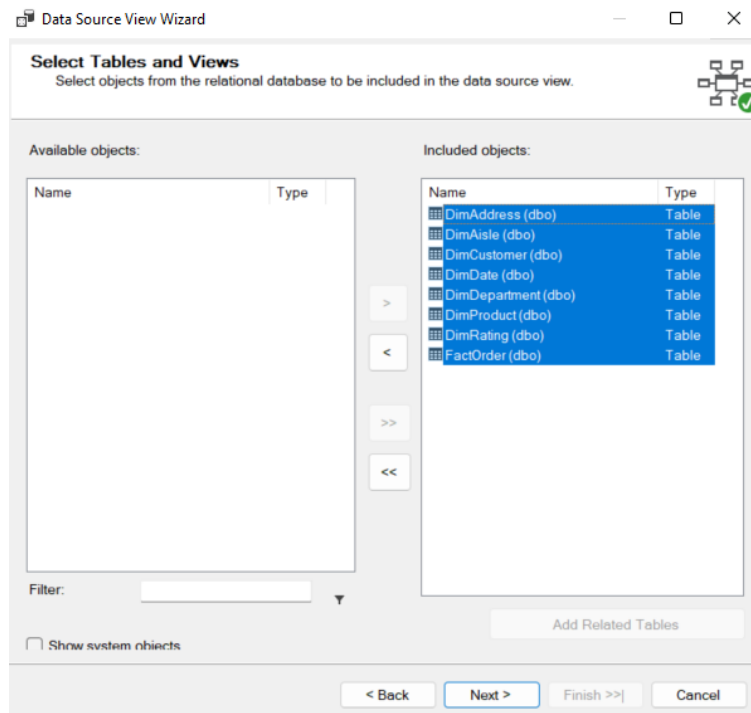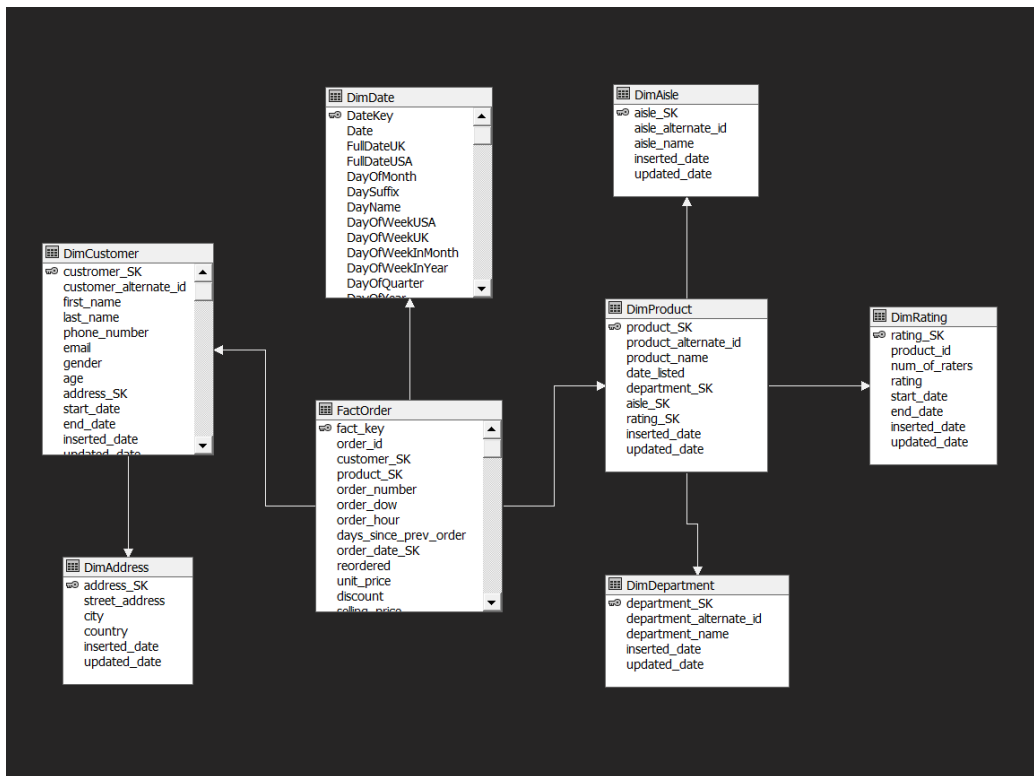
2.2 Creating cubes

New cube was created by selecting all attributes of the FactOrder table measures, and all dimension tables in the warehouse were selected as dimensions. After following the steps in the cube wizard, the snowflake schema was displayed as below.
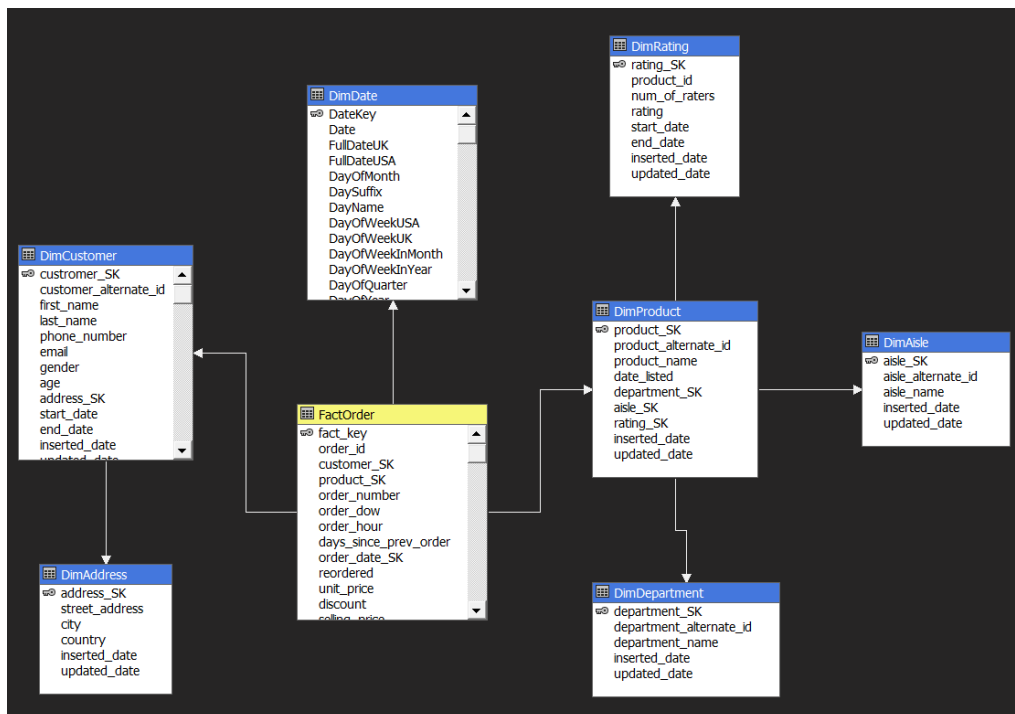
2.3 Editing Dimensions

All Attributes of the product dimensions and its child tables Department, Aisle and rating were added t0 the product dimension.
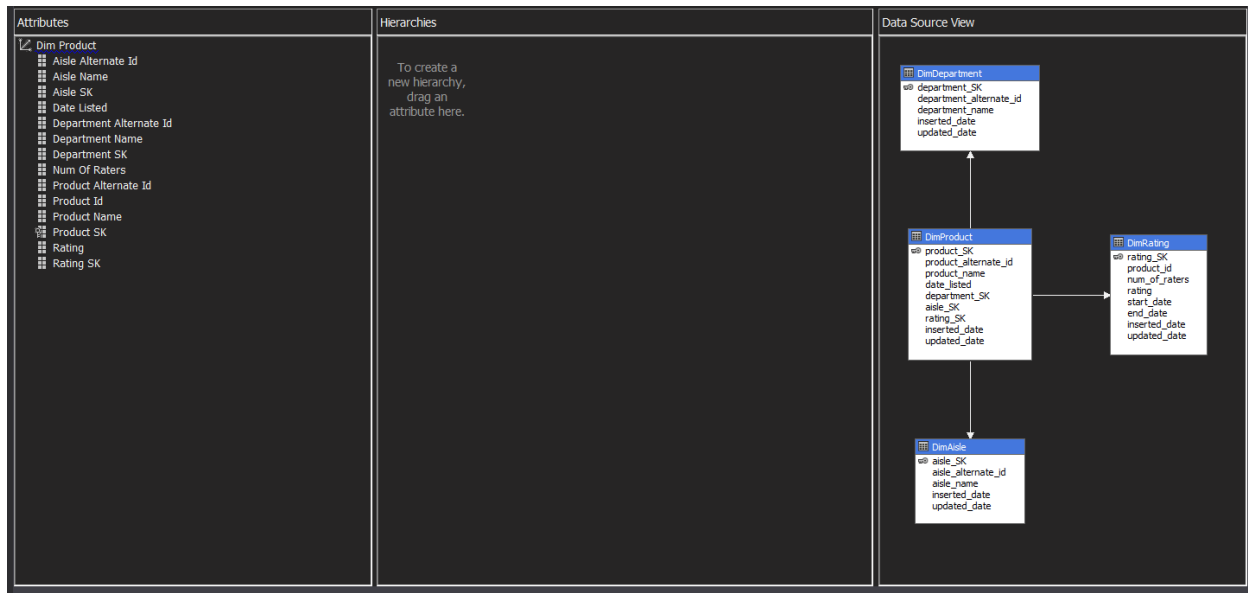
Year, Month and date hierarchy was created.
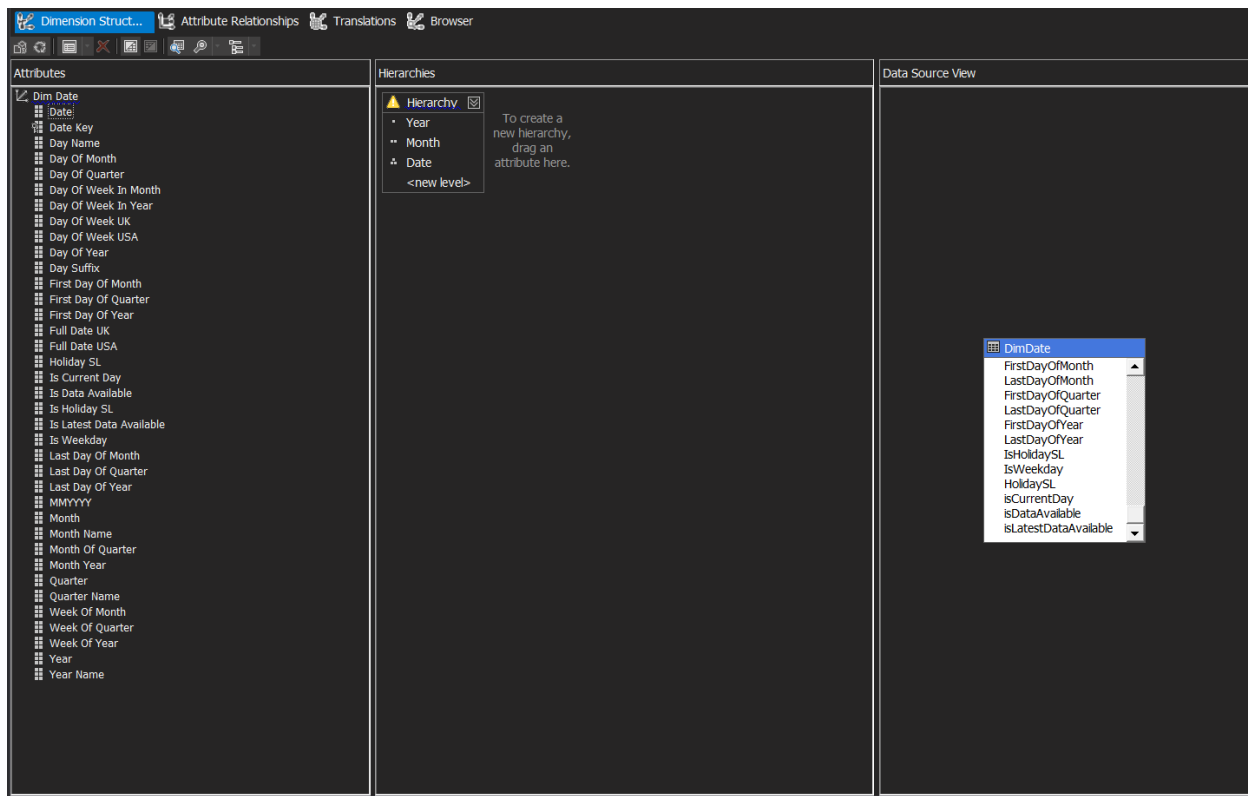
Country, City and street address hierarchy was created.
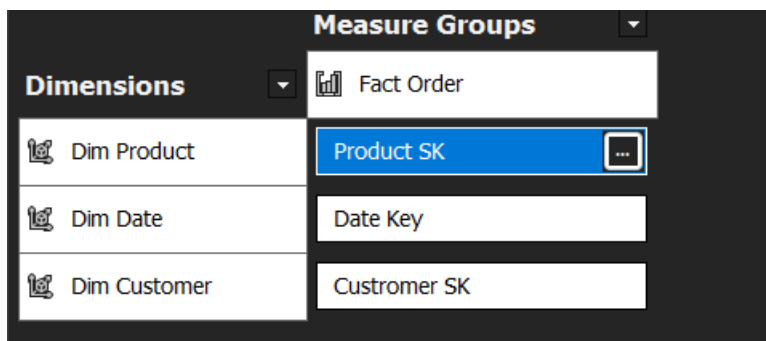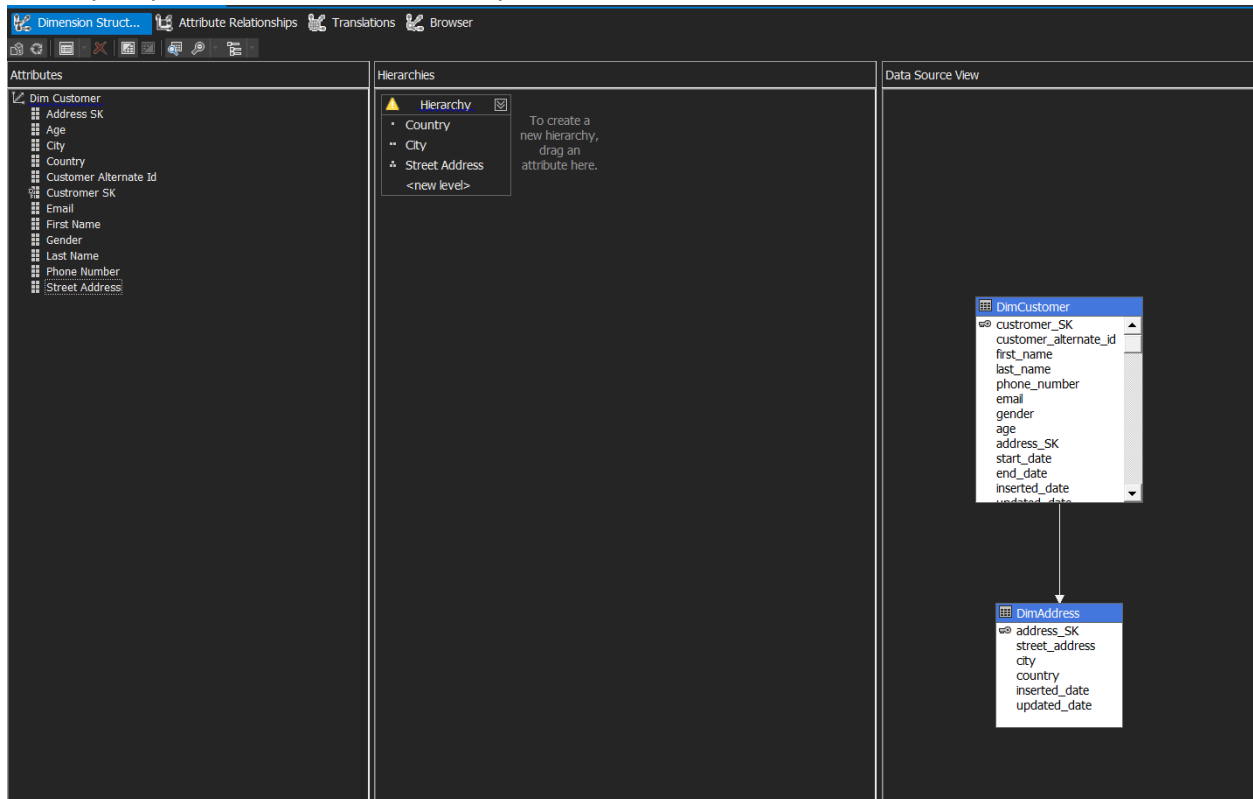
Finally, the Cube was deployed.

2.3 Creating KIPs

Key performance Indicators (KPI) are useful when generating reports. Few KPIs were created for this project to suite the reporting purposes.

2.4 Creating a role

Created a new role with full control.

3. OLAP demonstration

3.1 Rollup

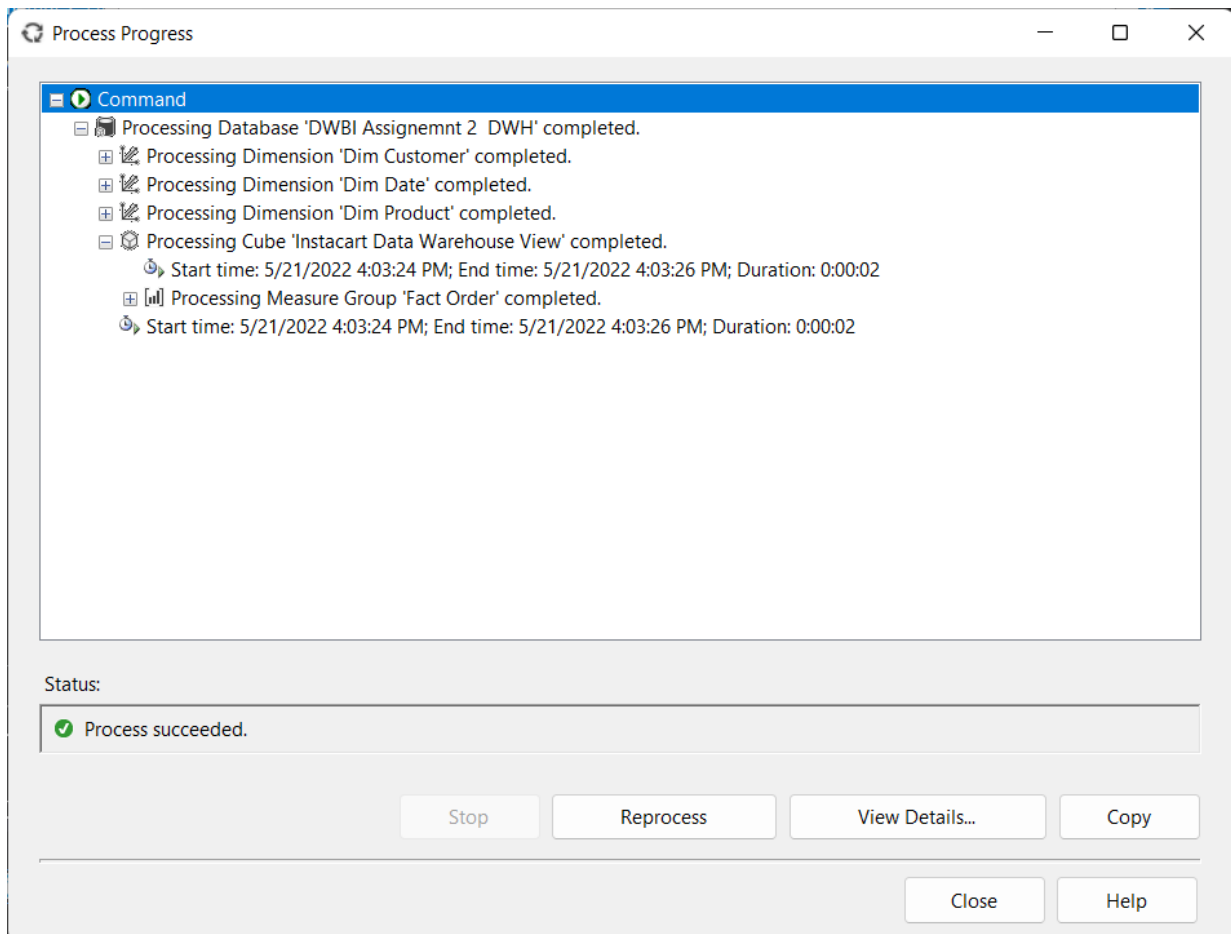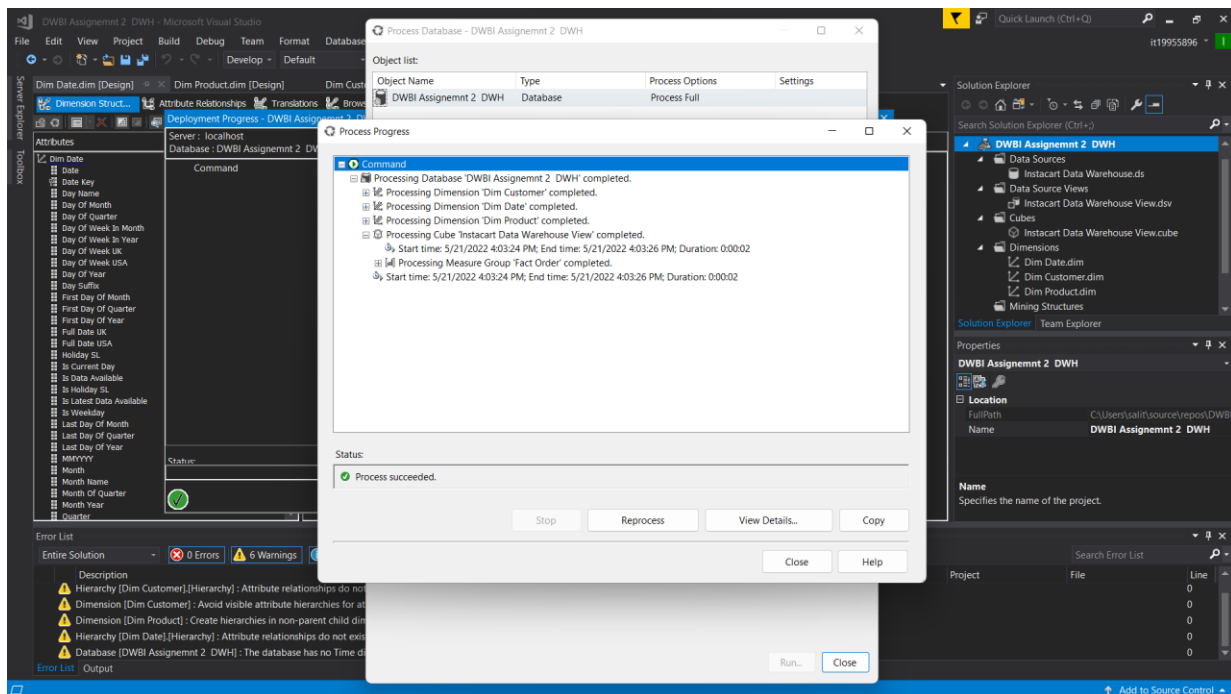|	A	B
1	Row Labels	Fact Order Count
2	⊞ alcohol	407
3	⊞ babies	249
4	⊞ bakery	1415
5	⊞ beverages	5483
6	⊟ breakfast	
7	7 Whole Grain Puffs Cereal	1
8	90 Calorie Chocolate Fudge Brownies	2
9	All-Bran Complete Wheat Flakes Cereal	1
10	Almond Chia Granola Clusters	2
11	Ancient Grain Blueberry Hemp Granola	3
12	Ancient Grain Granola Cranberry Pecan	1
13	Ancient Grain Original Granola	4
14	Apple Cinnamon Granola Clusters	1
15	Apple Cinnamon Hot Oatmeal	2
16	Apple Cinnamon Instant Oatmeal	5
17	Apple Cinnamon With Flax Instant Oatmeal	1
18	Apple Quinoa Cinnamon Oatmeal Fruit Squeeze	1
19	Baked Crackers, Cheddar Cheese	1
20	BelVita Blueberry Breakfast Biscuit Packs	2
21	Belvita Soft Baked Mixed Berry	1
22	Big Chewy Chocolate Chip Granola	1
23	Blueberry Almond Breakfast Bars	2
24	Blueberry Almond Granola	1
25	Blueberry Granola	1
26	Blueberry Pecan Mix Granola	1
27	Butter Flavor Instant Grits	1
28	Buttermilk Complete Pancake Mix	1
29	Cereal	18
30	Cereal Comet Crispies	1

3.2 Drilldown

Country->City->Street address hierarchy is used.

	A	B
1	Row Labels	Fact Order Count
2	⊞ Afghanistan	194
3	⊞ Albania	205
4	⊞ Algeria	206
5	⊞ Andorra	199
6	⊞ Angola	204
7	⊞ Antigua and Barbuda	194
8	⊞ Argentina	201
9	⊞ Armenia	202
10	⊞ Australia	195
11	⊞ Austria	196
12	⊞ Azerbaijan	205
13	⊞ Bahrain	202
14	⊞ Bangladesh	169
15	⊞ Barbados	215
16	⊞ Belarus	220
17	⊞ Belgium	197
18	⊞ Belize	204
19	⊞ Benin	197
20	⊞ Bhutan	194
21	⊞ Bolivia	184
22	⊞ Bosnia and Herzegovina	203
23	⊞ Botswana	181
24	⊞ Brazil	223
25	⊞ Brunei	247
26	⊞ Bulgaria	209
27	⊞ Burkina Faso	212
28	⊞ Burundi	194
29	⊞ Cabo Verde	193
30	⊞ Cambodia	200

3.3 Slice

	A	B	C	D	E	F
1	**Fact Order Count**					
2	**Product Name** ▾	**Total**				
3	Dried Mango	20				
4	Organic Black Mission Figs	2				
5	Organic Magic Muesli	2				
6	Organic Mung Beans	1				
7	Organic Pearled Barley	1				
8	Organic Quick Rolled Oats	2				
9	Organic Rolled Oats	7				
10	Organic Royal Rainbow Quinoa	1				
11	Organic Short Brown Sprouted Rice	3				
12	Organic Wheat Bran	1				
13	Pesto Sauce	2				
14	Vegetable Chips	1				
15	**Grand Total**	43				
16						

Department Name

- alcohol
- babies
- bakery
- beverages
- breakfast
- bulk
- canned goods
- dairy eggs

3.4 Dice

	A	B	C	D	E	F	G	H
1	**Fact Order Count**							
2	**Product Name** ▾	**Total**						
3	100% Cotton Swabs	1						
4	Clay Instant Luminous Facial Mask	1						
5	Jumbo Cotton Balls	2						
6	Nail Polish Remover	2						
7	Organic Cotton Balls	1						
8	Organic Naked Lip Balm	1						
9	The Colossal Volume Express 230 Glam Black Washable Mascara	1						
10	Volumizing Mascara Jet	1						
11	**Grand Total**	10						

Fact Order Count — Total chart (bar chart)

Department Name

- personal care
- alcohol
- babies
- bakery
- beverages
- breakfast
- bulk
- canned goods

Aisle Name

- beauty
- body lotions soap
- cold flu allergy
- deodorants
- digestion
- eye ear care
- facial care
- feminine care

3.4 Pivot

Below is a transposed pivot table.

	A	B	C	D	E	F	G	H	I
1	Row Labels ▾	alcohol ▾	babies ▾	bakery ▾	beverages ▾	breakfast ▾	bulk ▾	canned goods ▾	dairy eggs ▾
2	Fact Order Count	407	249	1415	5483	689	43	746	7788
3									
4									
5									
6									
7									

4. SSRS reports

SQL Server Services Configuration Manager was configured, and the web portal was visited using the URL before creating SSRS Reports.

Matrix

Orders By Month

Department Name	January	February	March	April	May	June	July	August	September	October	November	December	Total
alcohol	45	28	32	40	33	23	40	31	38	30	35	32	407
babies	16	20	26	26	14	29	16	22	15	24	13	28	249
bakery	105	119	103	132	131	113	131	101	118	123	115	124	1415
beverages	457	434	452	457	470	444	444	456	458	463	423	525	5483
breakfast	55	61	55	59	44	64	56	66	47	59	53	70	689
bulk	1	1	4	5	5	4	2	3	5	5	3	5	43
canned goods	49	57	64	61	72	46	68	64	66	69	69	61	746
dairy eggs	634	663	651	662	643	607	663	633	601	676	655	700	7788
deli	86	101	84	96	81	78	104	76	80	95	80	110	1071
dry goods pasta	63	57	51	47	44	42	62	63	65	50	43	54	641
frozen	199	158	185	173	242	188	191	200	207	215	210	196	2364
household	94	79	91	109	105	109	124	98	97	99	117	107	1229
international	20	15	17	18	21	7	26	21	12	22	25	17	221
meat seafood	87	63	70	66	81	68	76	85	82	84	80	88	930
missing	9	16	14	18	21	11	12	14	17	19	21	20	192
other	3	7	4	8	5	6		4	3	10	4	5	59
pantry	138	137	156	167	162	158	146	132	148	143	134	171	1792
personal care	59	60	68	76	57	50	57	68	69	53	59	67	743
pets	18	14	8	16	15	18	17	16	11	18	13	18	182
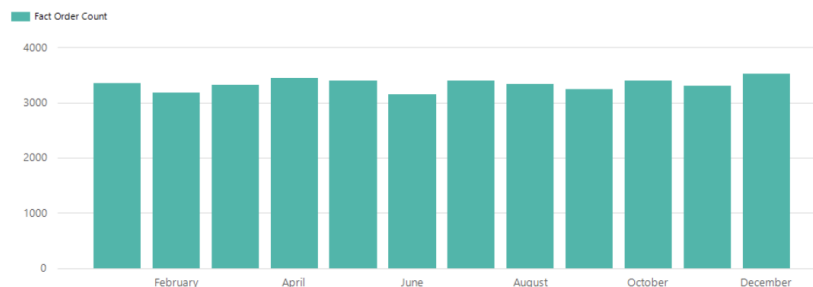
Multi Parameter

Initially the Department parameter should be selected, and the Aisle parameter changes accordingly. When both parameters are selected sales data will be populated.

Product Name	Rating	Order Count
100& Whole Grain Ranch Crackers	1.60	2
6 OZ LA PANZANELLA CROSTINI ORIGINAL CRACKERS	0.10	3
7 Grain Lite Crispbread	3.90	2
Almond Flour Fine Ground Sea Salt Crackers	0.60	2
Almond Nut & Rice Cracker Snacks	2.20	8
Almond Snack Crackers	4.00	2
Apple Cinnamon Rice Cakes	4.90	1
Baked Vegetable Brown Rice Snaps	1.50	1
Baked Whole Grain Reduced Fat Crackers	2.10	1
Baked Whole Grain Wheat Fire Roasted Tomato & Olive Oil Crackers	0.40	1

Drill Down

Total order count and income was taken based on the country. When the Country attribute is expanded the table populates with data based on the city.

SQL Server Reporting Services

★ Favorites   ☐ Browse

Home > Country Sales

|◁ ◁ 1 of 1 ▷ ▷| ↻ ⊖ 100% ⌄ 💾

Sales By Country

Country	City	Order Count	Income
⊞ Afghanistan		194	5363.77
⊞ Albania		205	6091.31
⊞ Algeria		206	6221.75
⊞ Andorra		199	5781.12
⊞ Angola		204	6032.9
⊞ Antigua and Barbuda		194	5746.27
⊞ Argentina		201	5942.94
⊞ Armenia		202	6132.03
⊞ Australia		195	5715.07
⊞ Austria		196	5840.87
⊞ Azerbaijan		205	5959.83
⊞ Bahrain		202	6199.89
⊞ Bangladesh		169	5267.22
⊞ Barbados		215	6477.72
⊞ Belarus		220	6349.9
⊞ Belgium		197	5974.28
⊞ Belize		204	6053.81
⊞ Benin		197	5663.2
⊞ Bhutan		194	5799.99

Drill Through

When click on the order count correspond to a particular department, a new report populates with the product details belongs to that department.