

Sri Lanka Institute of Information Technology

Data Warehousing and Business Intelligence (IT3021)

Assignment 2 – Year 3 Semester 2



ID: IT22358202

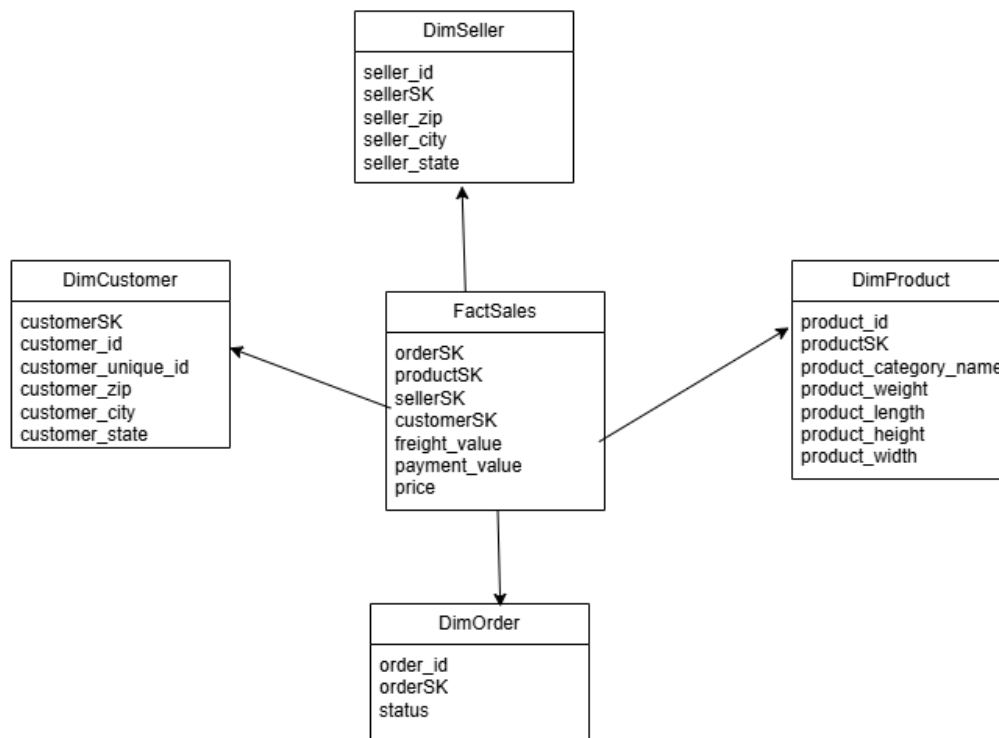
Name: B. N. P. Galwatta

Data source

A star schema was designed and implemented for the selected dataset; a Brazilian ecommerce public dataset of orders made at Olist Store. The schema centers around a Sales fact table and is connected to 4 dimension tables. Sales Fact Table captures transactional data related to each order item. It contains measurable metrics such as payment value and freight value, along with foreign keys referencing the associated dimension tables.

The following dimension tables are included:

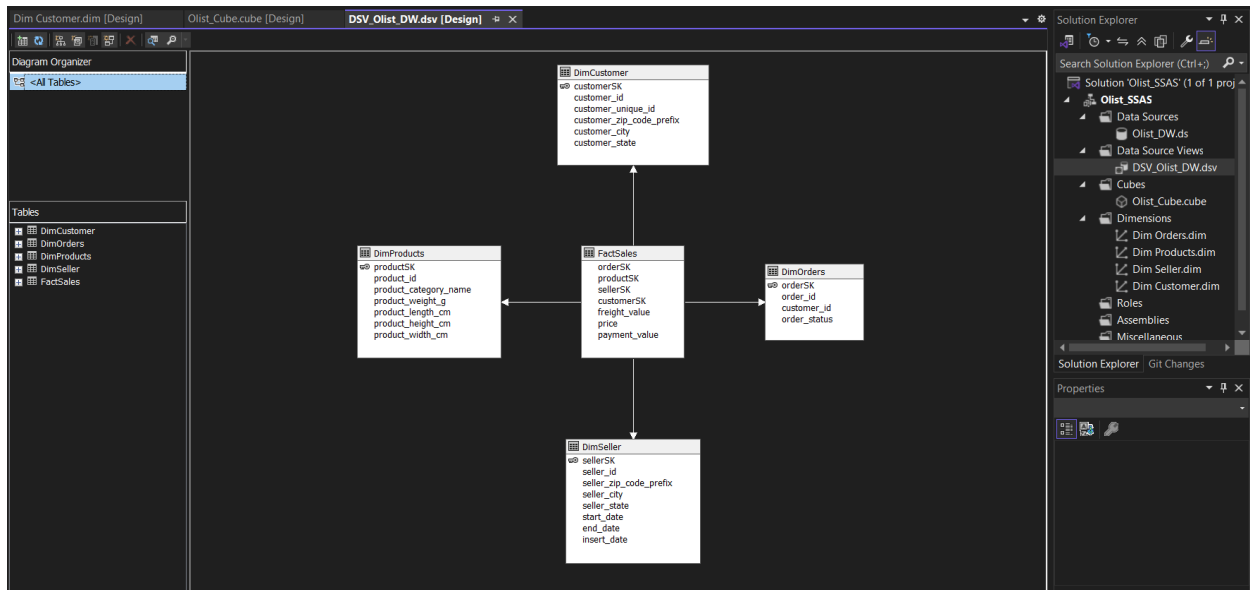
1. Customer Dimension
2. Seller Dimension
3. Order Dimension
4. Product Dimension



SSAS Cube implementation

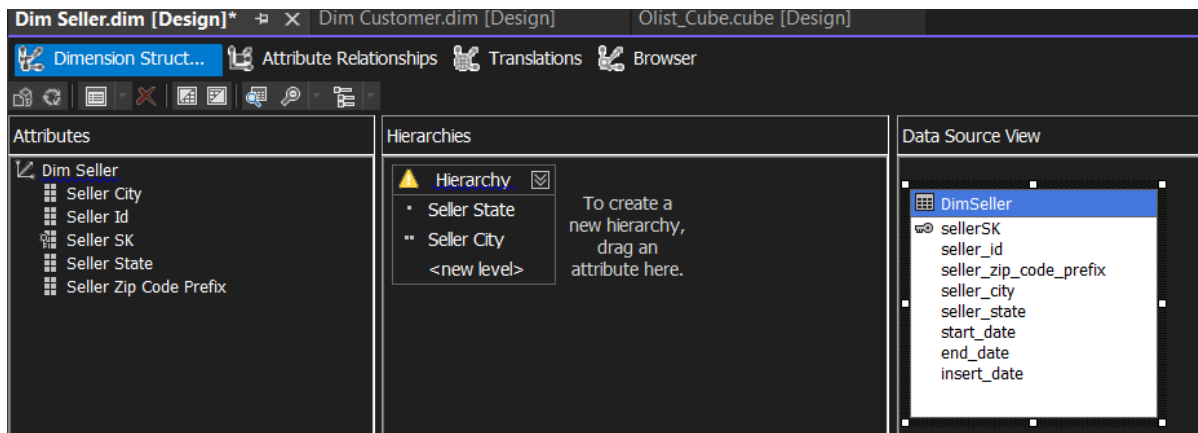
1. Launched and configured Olist_SSAS project in Visual Studio.
2. Added a new data source pointing to the SQL Server instance hosting the Olist data warehouse.
3. Created a data source view- DSV_Olist_DW- by selecting all relevant tables from the data warehouse:

- Fact Table: FactSales
- Dimension Tables: DimCustomer, DimSeller, DimProduct, DimOrder



4. Launched the cube wizard to create the cube and selected FactSales as the measure group and selected relevant measures.

5. Added the dimensions to the cube and implemented a hierarchy in DimCustomer and DimSeller.



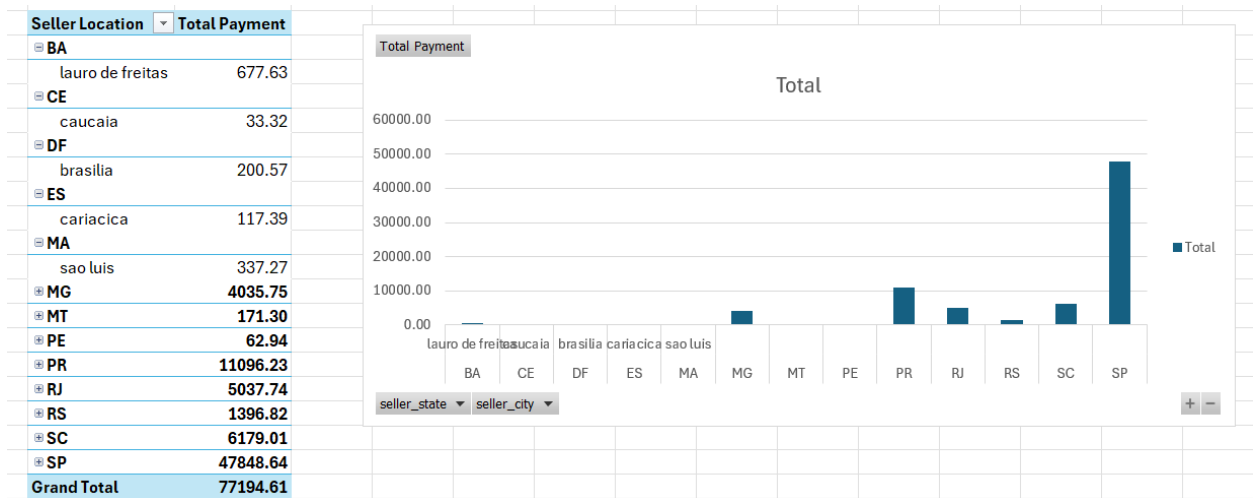
6. Defined attribute relationships within dimensions to improve performance and ensure accurate aggregations.
7. Deployed the cube to the SSAS server.

Demonstration of OLAP operations

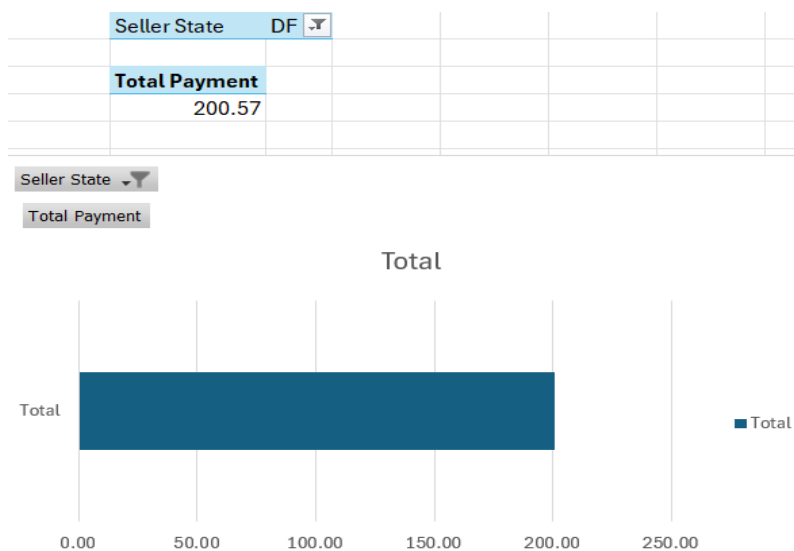
To analyze the data, an Excel workbook was connected to the warehouse to visualize and interact with the data using Pivot Tables and Charts.

Roll-Up and Drill-Down

- Added Total payment as a measure and Seller location dimension.
- Rolled up and drilled down state sales to city level.



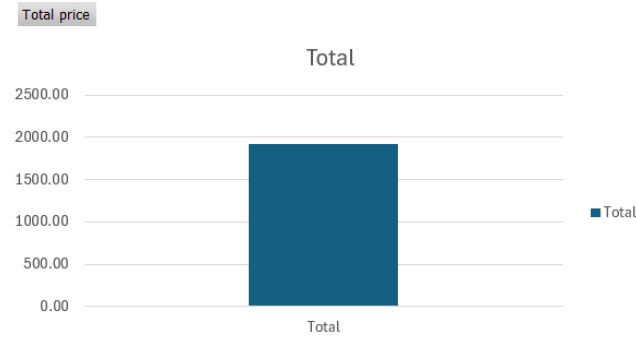
Slice: To isolate and analyze a specific subset of data. Slice by seller_state.



Dice: Dice by seller_state and product_category_name.

Seller State	All				
Product Category	(Multiple Items)				
Total price					
	1916.68				

Seller State Product Category

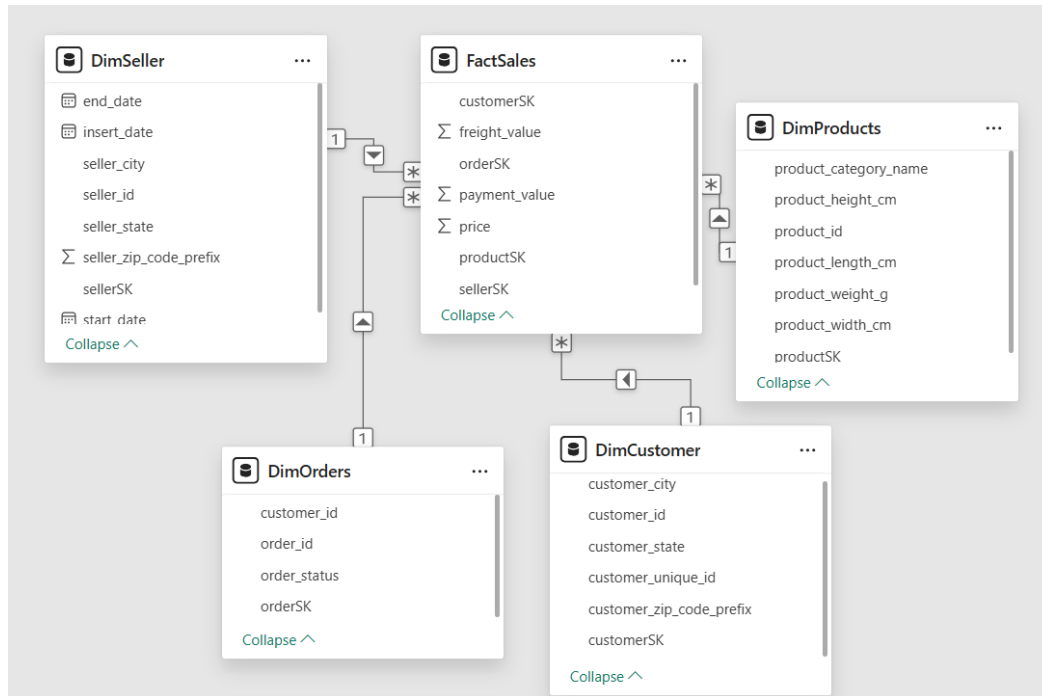


Pivot - To explore relationships from another analytical angle. Switched Seller State from rows to columns and Product Category from columns to rows.

Total Payment	Seller State														Grand Total
Product Category	BA	CE	DF	ES	MA	MG	MT	PE	PR	RJ	RS	SC	SP		
agro_industry_and_commerce													86.61000061	86.61000061	
audio													128.7799988	128.7799988	
auto									145.5700073				471.5500031	617.1200104	
baby						94.09999847							1218.489975	1312.589973	
bed_bath_table			81.59999847								20		396.2200012	497.8199997	
books_technical													68.63999939	68.63999939	
computers_accessories						52.38000107			197.7200012			58.40999985	1225.519958	1534.029961	
consoles_games						170.7099991			264.3800049					435.090004	
construction_tools_construction									128.7200012						128.7200012
construction_tools_lights													534.6100159	534.6100159	
furniture_decor													70.76000214	2381.159904	
garden_tools									2310.399902						
health_beauty												812.8499756		812.8499756	
housewares					148.1999969								136.5	284.6999969	
kitchen_dining_laundry_garden_furniture						171.4400024							233.0000038	404.4400063	
musical_instruments													75.09999847	75.09999847	
office_furniture													56.38999939	56.38999939	
perfumery													207.25	207.25	
signaling_and_security										56.38999939				56.38999939	
small_appliances													36.72999954	36.72999954	
sports_leisure												1981.219971		1981.219971	
telephony									319.1900024		116.9400024		457.260011	893.3900158	
toys													393.6000099	393.6000099	
Unknown													109.3099976	109.3099976	
watches_gifts						137.8300018				193			129.5899963	129.5899963	
(blank)	677.6300049	33.31999969	118.9699974	117.3899994	189.0699997	3409.289989	171.3000031	62.93999863	7537.249929	4961.350025	1279.879993	3326.530041	132.5700073	463.4000092	
Grand Total	677.6300049	33.31999969	200.5699959	117.3899994	337.2699966	4035.749992	171.3000031	62.93999863	11096.22985	5037.740025	1396.819996	6179.009987	47848.63992	77194.60976	

Power BI Reports

- Power BI Desktop was used to create and design reports, and they were published to Power BI Service for web-based access and sharing.
- Connected Power BI Desktop to the SQL Server database Olist_DW and imported tables.
- Defined relationships between fact and dimension tables using foreign key constraints. Ensured a star schema layout in the model view.



Report 1- This matrix visual displays the total sales revenue and freight costs grouped by seller city and product category, with columns representing different order statuses. It provides a clear view of how product sales and shipping costs vary across regions and fulfillment stages.

1. Inserted a Matrix visual.
2. Dragged seller city and product name into Rows.
3. Added order status into Columns.
4. Added price and freight value to Values.
5. Enabled row subtotals and column subtotals for better grouping.
6. Applied visual formatting: headers, gridlines, data bars and published.

Total sales revenue and Freight costs									
order_status	canceled		delivered		invoiced		processing		shipped
product_category_name	Sum of price	Sum of freight_value	Sum of price	Sum of freight_value	Sum of price	Sum of freight_value	Sum of price	Sum of freight_value	Sum of price
⊞ watches_gifts			413.90	49.50					
colombo			178.00	15.00					
formiga			118.90	18.93					
guariba			117.00	15.57					
⊞ Unknown			20.30	18.23					
⊞ toys			94.90	14.41					
⊞ telephony			364.80	28.80					
⊞ sports_leisure			852.80	60.10					
⊞ small_appliances			1,899.05	82.17					
⊞ signaling_and_security			18.50	18.23					
⊞ perfumery			109.90	18.05					
⊞ office_furniture			149.94	57.31					
⊞ musical_instruments			49.00	7.39					
⊞ kitchen_dining_laundry_gar			56.90	18.20					
den_furniture									
⊞ housewares			342.98	61.46					
⊞ health_beauty			243.89	40.81					
⊞ garden_tools			779.00	33.85					
⊞ furniture_decor			577.50	22.61					
⊞ construction_tools_lights			183.00	30.13					
⊞ construction_tools_construction			109.90	18.82					
⊞ consoles_games			348.99	86.10					
⊞ computers_accessories			685.66	121.62					
⊞ books_technical			57.49	11.15					
⊞ bed_bath_table			553.50	100.78					
⊞ baby			1,223.29	89.30					
⊞ auto			573.80	43.32					
⊞ audio			110.50	0.10					
Total	2,424.01	128.14	52,969.05	9,059.95	286.00	189.96	169.90	15.94	275.40

Report 2- This interactive report provides key insights into sales performance across different product categories, order statuses, and seller regions. Use the slicers - Seller State, Seller City, and Product Category name - to filter the data and explore specific segments.

- Created a cascading filter by ensuring a proper relationship between seller state and seller city.
- Inserted the following visuals:
 - Bar chart: Total sales by product category and order status.
 - Line chart: Trends in total orders across statuses and categories.
 - Map: Seller states
- Applied consistent theming and published.

Report 4 - Allow users to right-click on a seller city in a visual and navigate to a detailed page showing all product categories sold by that city with total sales.

- 1. Created a main report page showing sales by product and region.
- 2. Created a drill-through page.
- 3. Added a table showing product sales details.
- 4. Added a card visual showing selected seller city.
- 5. Enabled Right-Click → Drill Through functionality from main page visuals.
- 6. Added back button to return from drill-through page.
- 7. Published and validated navigation on Power BI Service.

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Product Sales by City		
product_category_name	Sum of price	Sum of freight_value
	12,847.30	2,224.45
construction_tools_lights	183.00	30.13
audio	119.59	9.19
housewares	89.18	8.98
books_technical	57.49	11.15
kitchen_dining_laundry_garden_furniture	56.90	18.20
computers_accessories	54.98	33.57
telephony	49.90	8.72
musical_instruments	49.00	7.39
sports_leisure	14.90	7.39
Total	13,522.24	2,359.17