

BrightLight Sales Case Study

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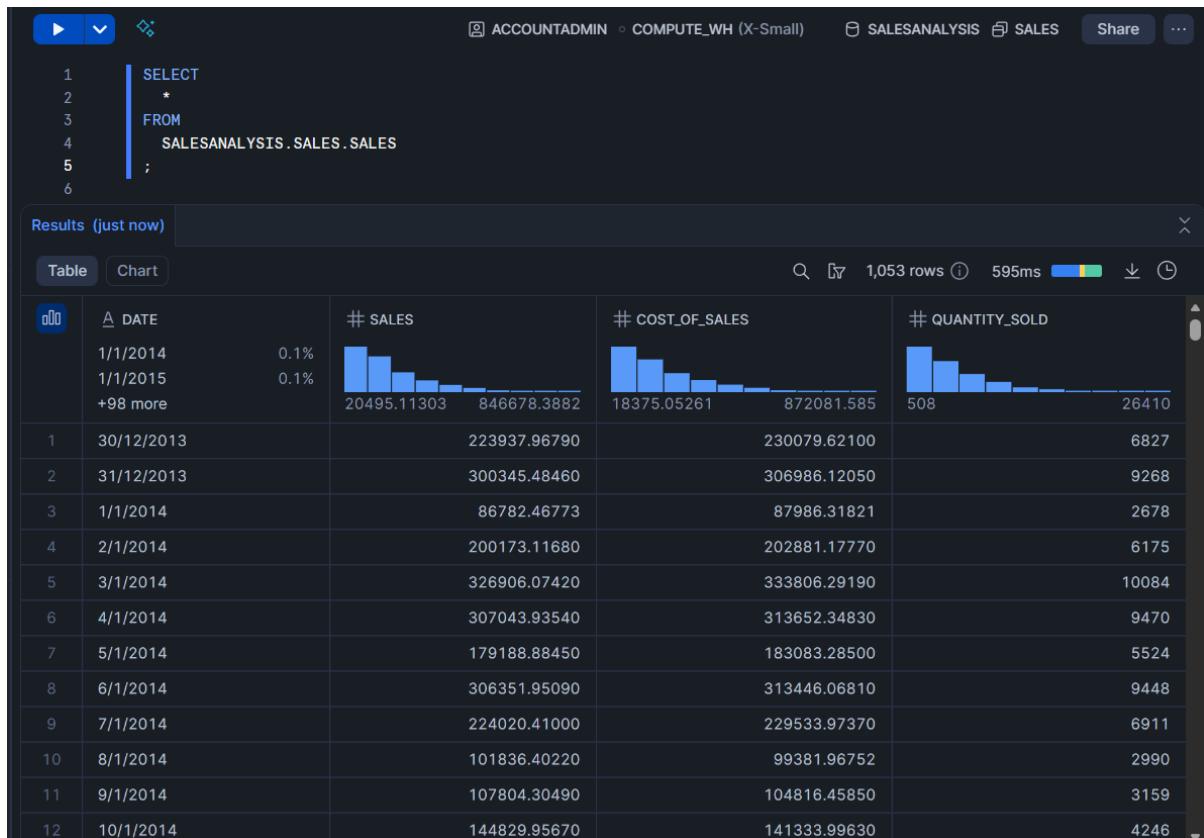
Introduction

This project was completed using **Snowflake SQL** and **Google Looker Studio** to analyze and visualize the *Sales Case Study* dataset. The dataset contains daily trading information for a retail store selling one specific product.

Each record includes:

- **Date** – The day the sales occurred
- **Sales** – Total Rand value of sales
- **Cost of Sales** – Total Rand value of the cost of sales
- **Quantity Sold** – Total number of units sold

The objective was to calculate several key metrics, perform deeper analysis, and derive insights through data visualizations and dashboards.

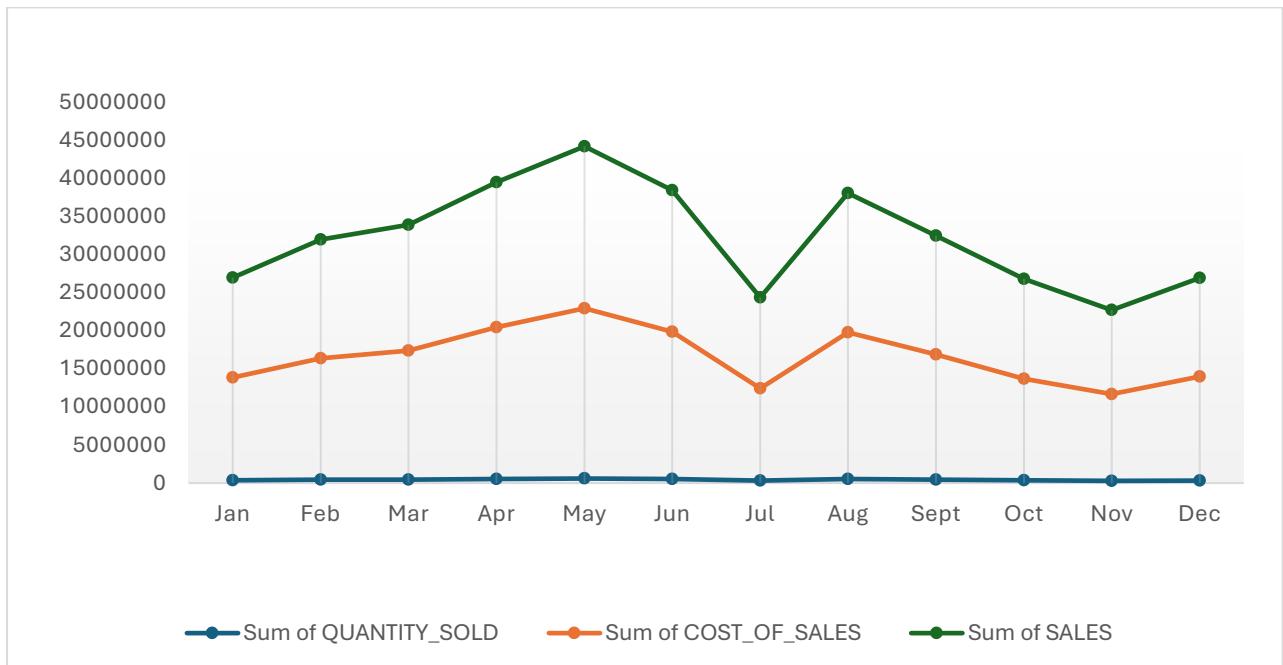


Data Preparation

After loading the dataset into Snowflake, the first step was to check:

- **Data completeness** (no missing values)
- **Data types** for each column
- **Duplicate records**
- **Date formatting** to ensure smooth time-based analysis

Once cleaned, the data was explored to understand the relationship between **Sales**, **Quantity Sold**, and **Cost of Sales**.

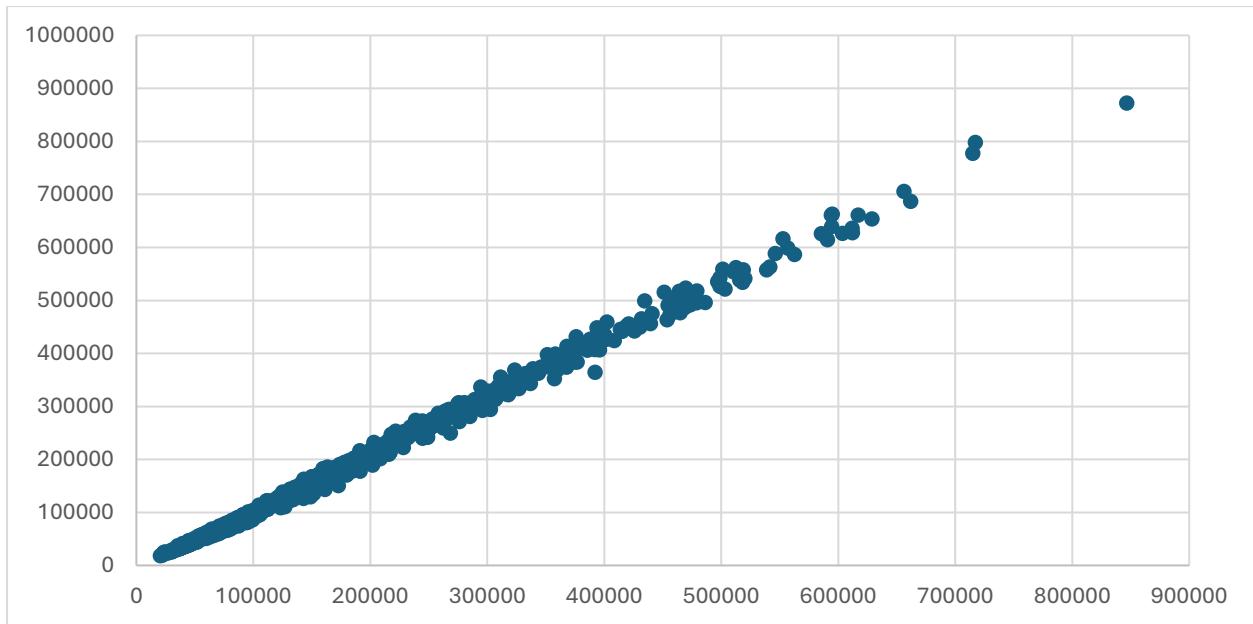


Observation:

As Sales increased, both Quantity Sold and Cost of Sales also increased, showing a direct positive relationship between these variables.

Exploratory Data Analysis (EDA)

To identify potential **outliers**, a scatter plot of *Sales* vs. *Cost of Sales* was created. The visual showed that most points followed a linear trend, with few extreme values indicating unusual sales days — possibly during **promotional events**.



Calculations and Metrics

Question 1: Daily Sales Price per Unit

Formula:

$$\text{Sales Price per Unit} = \frac{\text{Sales}}{\text{Quantity Sold}}$$

```

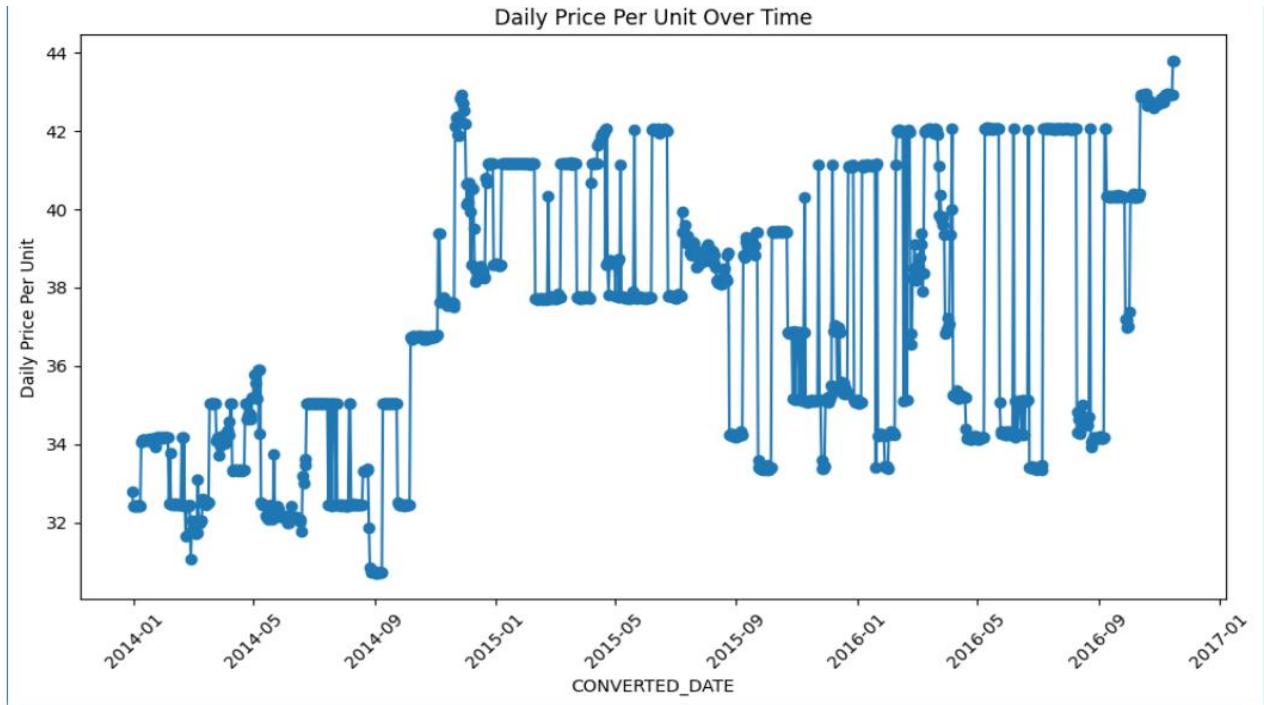
8      -- 1. What is the daily sales price per unit?
9      | SELECT
10     |   DATE,
11     |   SALES,
12     |   COST_OF_SALES,
13     |   QUANTITY SOLD,
14     |   (SALES / IFNULL(QUANTITY SOLD, 0)) AS Daily_Price_Per_Unit
15     |
16     | FROM
17     |   SALESANALYSIS.SALES.SALES;

```

Results (just now)

	DATE	SALES	COST_OF_SALES	QUANTITY SOLD	DAILY_PRICE_PER_UNIT
1	30/12/2013	223937.96790	230079.62100	6827	32.80181161564
2	31/12/2013	300345.48460	306986.12050	9268	32.40672039275
3	1/1/2014	86782.46773	87986.31821	2678	32.40570116878
4	2/1/2014	200173.11680	202881.17770	6175	32.41669907692
5	3/1/2014	326906.07420	333806.29190	10084	32.41829375248
6	4/1/2014	307043.93540	313652.34830	9470	32.42280204857
7	5/1/2014	179188.88450	183083.28500	5524	32.43824846126
8	6/1/2014	306351.95090	313446.06810	9448	32.42505830864

The result showed fluctuations over time, with stable pricing periods interrupted by short-term changes likely linked to promotions.



Question 2: Average Unit Sales Price

The average selling price was derived using the overall total:

$$\text{Average Unit Price} = \frac{\text{Total Sales}}{\text{Total Quantity Sold}}$$

```
18 |     SELECT
19 |         SUM(SALES) / NULLIF(SUM(QUANTITY_SOLD), 0) AS averagesalesprice
20 |     FROM
21 |         SALESANALYSIS.SALES.SALES;
22 |
23 |
```

results (just now)

Table Chart

1 AVERAGESALESPRICE 35.40044687767

This represents the general price level at which the product was sold throughout the observed period.

Question 3: Daily % Gross Profit

Gross Profit = Sales – Cost of Sales

Gross Profit % = (Gross Profit / Sales) × 100

A negative value indicates the product was sold at a loss (Cost of Sales exceeded Sales).

```

23 |     SELECT
24 |         ((SALES - COST_OF_SALES) / NULLIF(SALES, 0)) * 100 AS dailygrossprofit
25 |
26 |     FROM
27 |         SALESANALYSIS.SALES.SALES;

```

Results (just now)

Table Chart

1 # DAILYGROSSPROFIT

0		-2.74256891700
1		-2.21099908000
2		-1.38720471000
3		-1.35285943700
4		-2.11076460300
5		-2.15226947600
6		-2.17334937400
7		-2.31567554200
8		-2.46118811200
9		

Question 4: Daily % Gross Profit per Unit

$$\text{Gross Profit per Unit} = \frac{\text{Gross Profit}}{\text{Quantity Sold}}$$

```

28 |     SELECT
29 |         DATE,
30 |         SALES,
31 |         COST_OF_SALES,
32 |         QUANTITY SOLD,
33 |         (SALES - COST_OF_SALES) / NULLIF(QUANTITY SOLD, 0) AS Daily_Gross_Per_Unit
34 |
35 |     FROM
36 |         SALESANALYSIS.SALES.SALES;

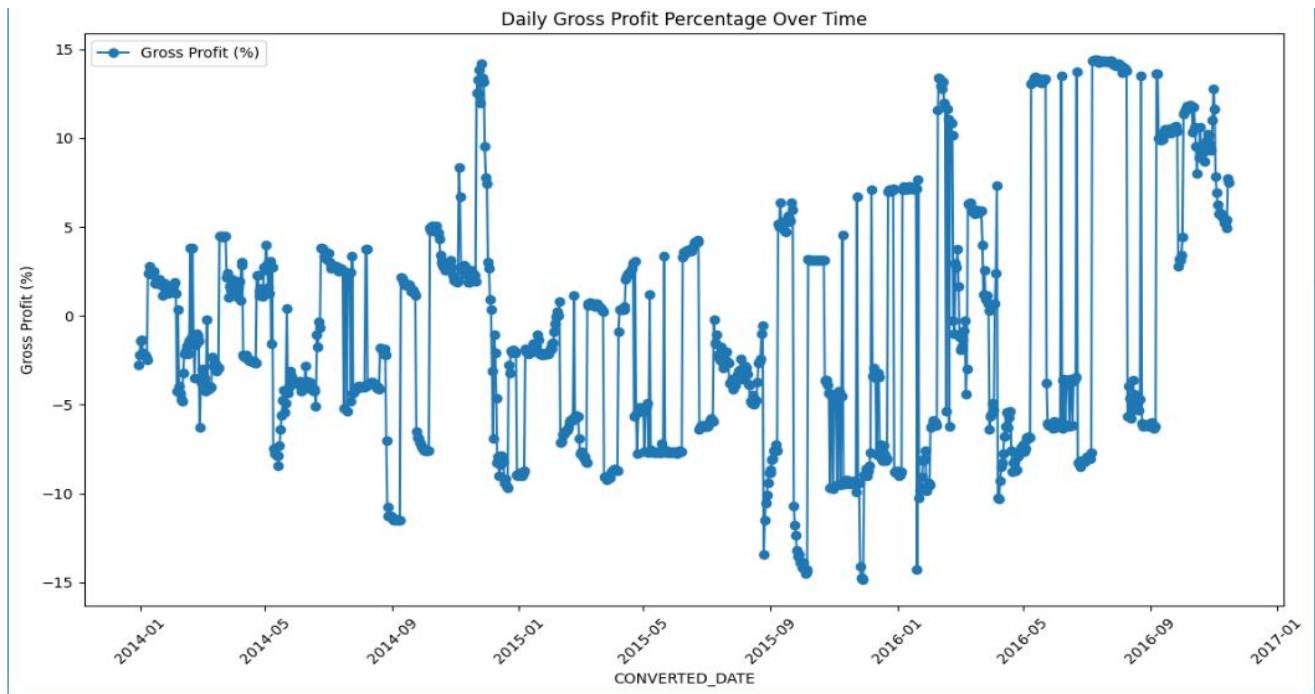
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Results (just now)

Table Chart

	A DATE	# SALES	# COST_OF_SALES	# QUANTITY SOLD	# DAILY_GROSS_PER_UNIT
0	30/12/2013	223937.96790	230079.62100	6827	-0.89961228944
1	31/12/2013	300345.48460	306986.12050	9268	-0.71651228960
2	1/1/2014	86782.46773	87986.31821	2678	-0.44953341299
3	2/1/2014	200173.11680	202881.17770	6175	-0.43855237247
4	3/1/2014	326906.07420	333806.29190	10084	-0.68427386950
5	4/1/2014	307043.93540	313652.34830	9470	-0.69782607181
6	5/1/2014	179188.88450	183083.28500	5524	-0.70499646995
7	6/1/2014	306351.95090	313446.06810	9448	-0.75085914479
8	7/1/2014	224020.41000	229533.97370	6911	-0.79779535523
9	8/1/2014	101836.40220	99381.96752	2990	0.82088116388

This helps assess the profitability per unit sold over time.



Question 5: Promotions and Price Elasticity of Demand (PED)

Based on spikes in sales from the *Date vs Sales* graph, the following promotional periods were identified:

1. **2013-12-30 – 2013-12-31**
2. **2014-01-03 – 2014-01-04**
3. **2014-01-06 – 2014-01-07**

The **Price Elasticity of Demand (PED)** formula:

$$PED = \frac{\% \text{ Change in Quantity Sold}}{\% \text{ Change in Price}}$$

Analysis showed that the product was **price elastic**, meaning small decreases in price led to large increases in quantity sold.

This suggests that promotions boosted demand significantly.

```

1 USE DATABASE SALESANALYSIS;
2 USE SCHEMA SALES;
3
4 -- Create temp table for promo analysis (with Base_Start/Base_End)
5
6 CREATE
7 OR REPLACE TEMP TABLE SALESANALYSIS.SALES.PROMO_ANALYSIS (
8     Promo_Name STRING,
9     Base_Start DATE,
10    Base_End DATE,
11    Base_Price FLOAT,
12    Promo_Price FLOAT,
13    Base_Qty FLOAT,
14    Promo_Qty FLOAT,
15    Price_Change FLOAT,
16    Qty_Change FLOAT,
17    Price_Elasticity FLOAT
18 );
19
20 -- Insert promo data with defined base and promo periods
21
22 INSERT INTO
23     SALESANALYSIS.SALES.PROMO_ANALYSIS WITH promos AS (
24
25     SELECT
26         'Promo 1' AS Promo_Name,
27         TO_DATE('30/12/2013', 'DD/MM/YYYY') AS Base_Start,
28         TO_DATE('31/12/2013', 'DD/MM/YYYY') AS Base_End,
29         TO_DATE('01/01/2014', 'DD/MM/YYYY') AS Promo_Start,
30         TO_DATE('02/01/2014', 'DD/MM/YYYY') AS Promo_End
31     UNION ALL
32     SELECT
33         'Promo 2',
34         TO_DATE('03/01/2014', 'DD/MM/YYYY'),
35         TO_DATE('04/01/2014', 'DD/MM/YYYY'),
36         TO_DATE('05/01/2014', 'DD/MM/YYYY'),
37         TO_DATE('06/01/2014', 'DD/MM/YYYY')
38     UNION ALL
39     SELECT
40         'Promo 3',
41         TO_DATE('06/01/2014', 'DD/MM/YYYY'),
42         TO_DATE('07/01/2014', 'DD/MM/YYYY'),
43         TO_DATE('08/01/2014', 'DD/MM/YYYY'),
44         TO_DATE('08/01/2014', 'DD/MM/YYYY')
45     )
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A screenshot of a Power BI data grid titled 'Table'. The grid displays 3,159 rows of data with columns: WEEKDAY_SALES, PROMO_NAME, BASE_START, BASE_END, BASE_PRICE, PROMO_PRICE, BASE_QTY, and Profit. The data shows multiple entries for each day, with some rows having a red background.

	WEEKDAY_SALES	PROMO_NAME	BASE_START	BASE_END	BASE_PRICE	PROMO_PRICE	BASE_QTY	Profit
1	145890.66	Promo 1	2013-12-30	2013-12-31	32.604266004	32.411200123	8047.5	
2	145890.66	Promo 2	2014-01-03	2014-01-04	32.420547901	32.431653385	9777	
3	145890.66	Promo 3	2014-01-06	2014-01-07	32.420054115	34.058997391	8179.5	
4	141084.76	Promo 1	2013-12-30	2013-12-31	32.604266004	32.411200123	8047.5	
5	141084.76	Promo 2	2014-01-03	2014-01-04	32.420547901	32.431653385	9777	
6	141084.76	Promo 3	2014-01-06	2014-01-07	32.420054115	34.058997391	8179.5	
7	245313.97	Promo 1	2013-12-30	2013-12-31	32.604266004	32.411200123	8047.5	
8	245313.97	Promo 2	2014-01-03	2014-01-04	32.420547901	32.431653385	9777	
9	245313.97	Promo 3	2014-01-06	2014-01-07	32.420054115	34.058997391	8179.5	
10	145890.66	Promo 1	2013-12-30	2013-12-31	32.604266004	32.411200123	8047.5	
11	145890.66	Promo 2	2014-01-03	2014-01-04	32.420547901	32.431653385	9777	
12	145890.66	Promo 3	2014-01-06	2014-01-07	32.420054115	34.058997391	8179.5	
13	141084.76	Promo 1	2013-12-30	2013-12-31	32.604266004	32.411200123	8047.5	
14	141084.76	Promo 2	2014-01-03	2014-01-04	32.420547901	32.431653385	9777	
15	141084.76	Promo 3	2014-01-06	2014-01-07	32.420054115	34.058997391	8179.5	
16	279047.26	Promo 1	2013-12-30	2013-12-31	32.604266004	32.411200123	8047.5	
17	279047.26	Promo 2	2014-01-03	2014-01-04	32.420547901	32.431653385	9777	

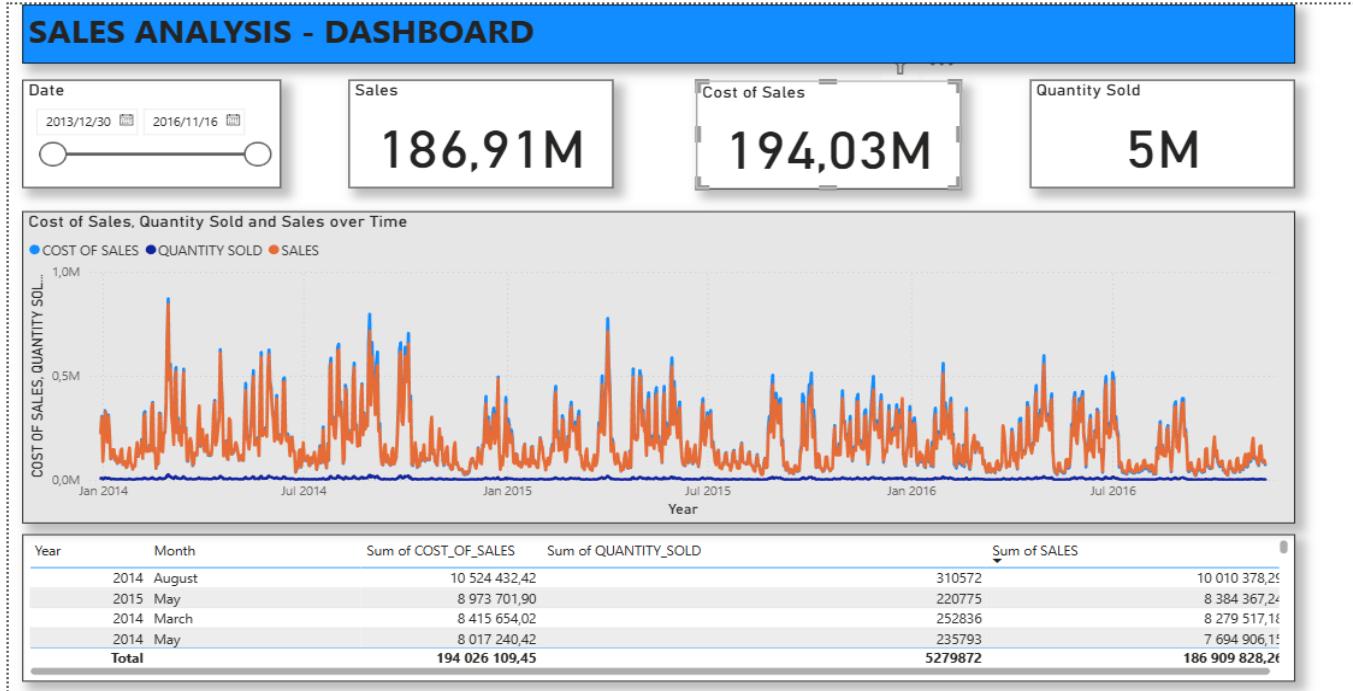
Additional Insights and KPIs

Using Power BI, additional KPIs and visuals were developed:

KPI / Metric	Description
Total Sales (R)	Overall revenue generated
Total Units Sold	Total quantity sold over time
Average Gross Profit %	Indicates profitability trends
Best Performing Days	Identifies days with peak sales
Price Elasticity Score	Highlights responsiveness to price changes

Visuals created:

- Line chart showing *Sales, Cost of Sales, and Quantity Sold* over time
- KPI cards for *Total Sales, Total Cost of Sales, and Quantity Sold*.



Conclusion

The analysis demonstrated that:

- Sales and quantity sold increase during promotional periods.
- The product is sensitive to price changes (elastic).
- Consistent profitability requires careful pricing and cost management.
- Interactive dashboards help track performance and identify sales trends in real time.