POWER BI PROJECT

PHARMACEUTICAL SALES INSIGHTS DASHBOARD

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Project Title: **Pharmaceutical Sales and Customer Insights**

Background:

The pharmaceutical industry is vast and complex, requiring continuous monitoring of sales data,customer demographics, and production costs to optimize sales strategies, compliance, and resource allocation. This project aims to leverage Power BI to create an interactive Pharmaceutical Sales Insights Dashboard, which will provide valuable insights into sales performance, customer demographics, and production cost analysis. This will help stakeholders make data-driven decisions to improve sales performance, customer targeting, and operational efficiency.

Objective:

To design and implement an interactive Power BI dashboard that consolidates pharmaceutical sales data and visualizes key business indicators. The dashboard aims to:

- ✓ Analyze sales performance
- ✓ Understand customer demographics
- ✓ Monitor production costs and profitability
- ✓ Support strategic and regulatory decision-making

Problem Statement:

The Pharmaceutical Sales Insights Dashboard seeks to address the following key requirements:

1. Sales Performance Analysis:

○ Analyze sales data by tracking units sold, total revenue, and profitability (unit sales price vs. cost of production).

○ Identify top-selling drugs and low-performing drugs based on sales volume and revenue.

○ Evaluate sales trends over time to identify seasonal fluctuations, spikes, and downturns.

2. Customer Demographics and Segmentation:

○ Segment customers based on age, gender, and buyer type (individual, retailer, etc.) to understand purchasing behavior patterns.

○ Analyze the average spend per customer segment and identify high-value customers.

○ Evaluate the geographic distribution of customers to understand market penetration in various regions (based on country data).

3. **Regulatory Compliance and Drug Performance:**

○ Assess sales performance for each drug, taking into account regulatory compliance and drug performance over time.

○ Track the relationship between compliance and sales trends for specific drugs.

4. **Profitability and Cost Analysis:**

○ Analyze the cost of production for each drug and compare it with the unit sales price to calculate profitability.

○ Identify drugs with the highest profit margins and those that are under performing based on production costs and sales prices.

5. **Trend Analysis by Date:**

○ Track sales data over different time periods to understand how sales are evolving.

○ Visualize trends in drug sales over specific months or years, and detect patterns that can inform inventory and pricing decisions.

Deliverables:

The deliverables for this project will include:

● An interactive Pharmaceutical Sales Insights Dashboard developed in Power BI.

● Visualizations such as bar and line charts, KPI indicators, and heatmaps for sales performance, demographics, and profitability.

● A detailed documentation of data sources, transformation logic, and dashboard functionality.

● A presentation of key insights, including actionable recommendations based on the dashboard analysis.

Success Criteria:

The success of the project will be evaluated based on:

● The ability of the dashboard to provide accurate, actionable insights into sales and customer data.

● The effectiveness of the dashboard in helping stakeholders make informed decisions to improve sales strategies and customer engagement.

● User satisfaction with the dashboard's usability, interactivity, and its effectiveness in simplifying complex data.

Star Schema Implementation:

To ensure efficient data management and querying, a star schema will be implemented:

● **Fact Table:** Sales transactions (e.g., units sold, revenue, cost of production, profit).

● **Dimension Tables:**

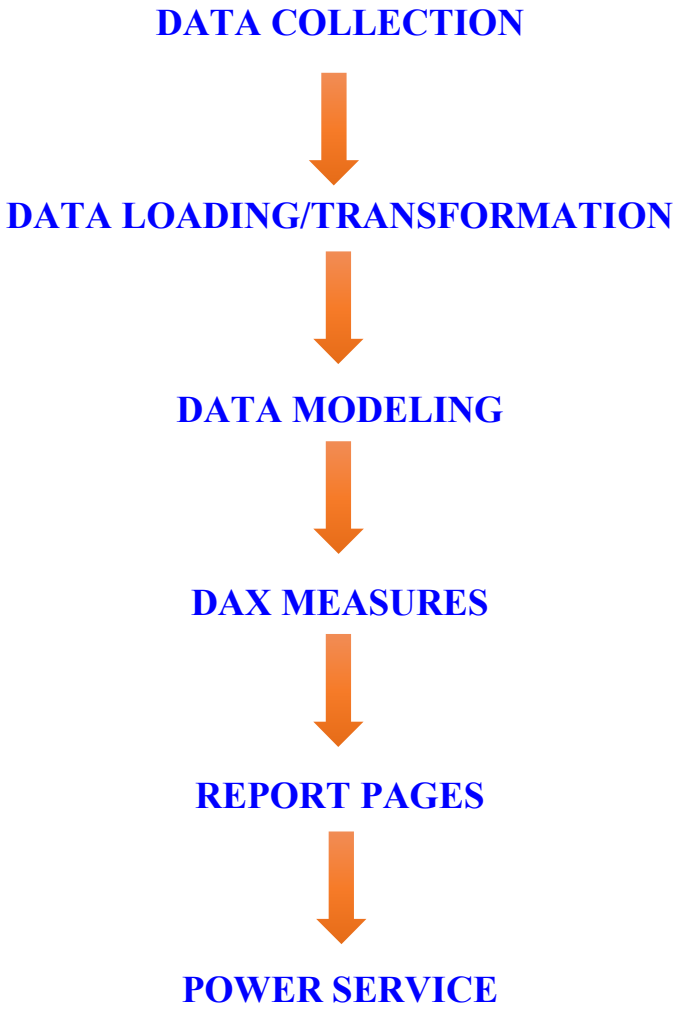
○ **Date Dimension:** Year, quarter, month, and day.

○ **Customer Dimension:** CustomerID, buyer type, age, gender, and country.

○ **Drug Dimension:** DrugID, drug name, regulatory compliance ID, unit sales price, and cost of production.

By addressing these key requirements, the Pharmaceutical Sales Insights Dashboard will empower stakeholders to better understand sales trends, customer behavior, and profitability, allowing for more informed decision-making and optimization of the pharmaceutical sales process.

STEPS :



STEP 1:

DATA COLLECTION:

In this project, data has been gathered from a structured sales dataset that includes detailed information about drug sales, customer demographics, pricing, production costs, and regulatory compliance. The collected data enables comprehensive analysis of sales performance, customer behavior, profitability, and geographic trends. By integrating multiple data points such as sales transactions, drug details, and customer attributes, the dashboard supports accurate reporting, effective decision-making, and deeper insights into pharmaceutical market dynamics.

In our dataset we have these original columns,SaleID,DrugID,CustomerID,full Name,BuyerType,Age,Gender,Country,DrugName,UnitsSold,UnitSalesPrice,CostPer Unit,CostOfProduction,RegulatoryComplianceID.

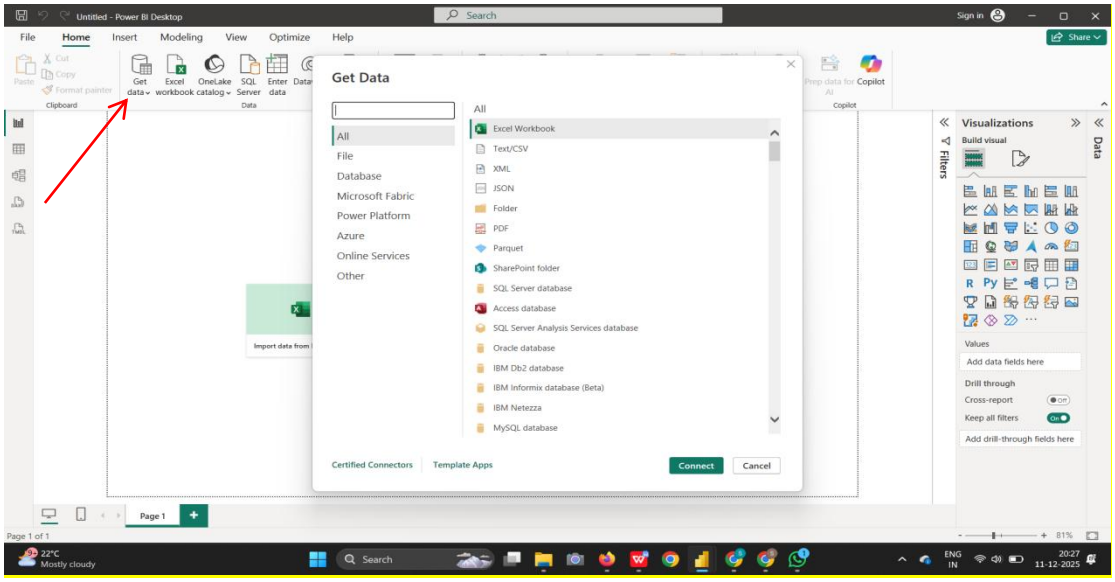
SL.NO	SALES DATA	DRUG DATA	CUSTOMER DATA	COST DATA
1.	SalesID	DrugID	CustomerID	Cost Of Production
2.	SalesDate	Drugname	CustomerName	RegulatoryComplianceID
3.	UnitsSold		Age	
4.	UnitSalesPrice		Gender	
5.	BuyerType		Country	

- ✧ To support a clean star schema model, the original dataset columns were standardized, renamed, and reorganized into fact and dimension tables.
- ✧ The **Sales** table stores transaction values, while **Drug**, **Customer**, and **Cost** tables store descriptive information.
- ✧ This ensures data normalization, eliminates duplication, and improves model performance inside Power BI.

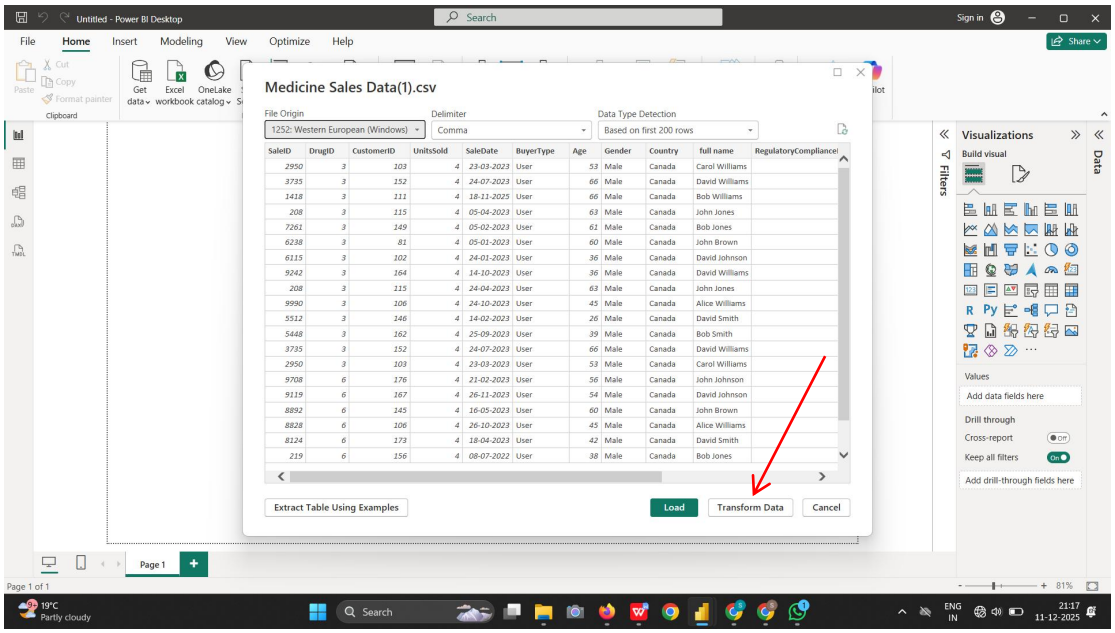
Step:2

DATA LOADING:

1. Loading the dataset/csv file into Power BI is super simple! Once you have opened Power BI desktop, click the Get Data button in the toolbar at the top of your screen, then select the Text/CSV option.

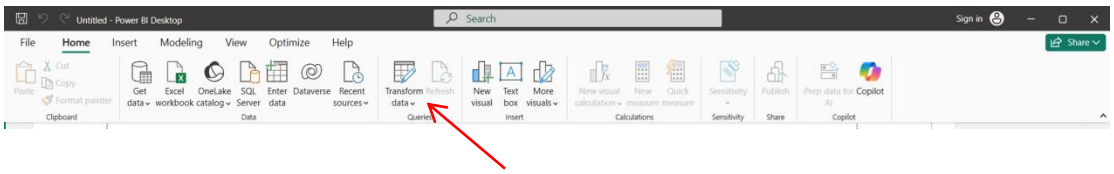


2. From there, a window will pop up and you will have to navigate to the folder you saved the dataset in. Once you've selected the dataset, you'll see the following window which gives you a preview of the data in the file.
3. Click the Transform Data button in the bottom right corner, and it will take you to Power Query Editor.

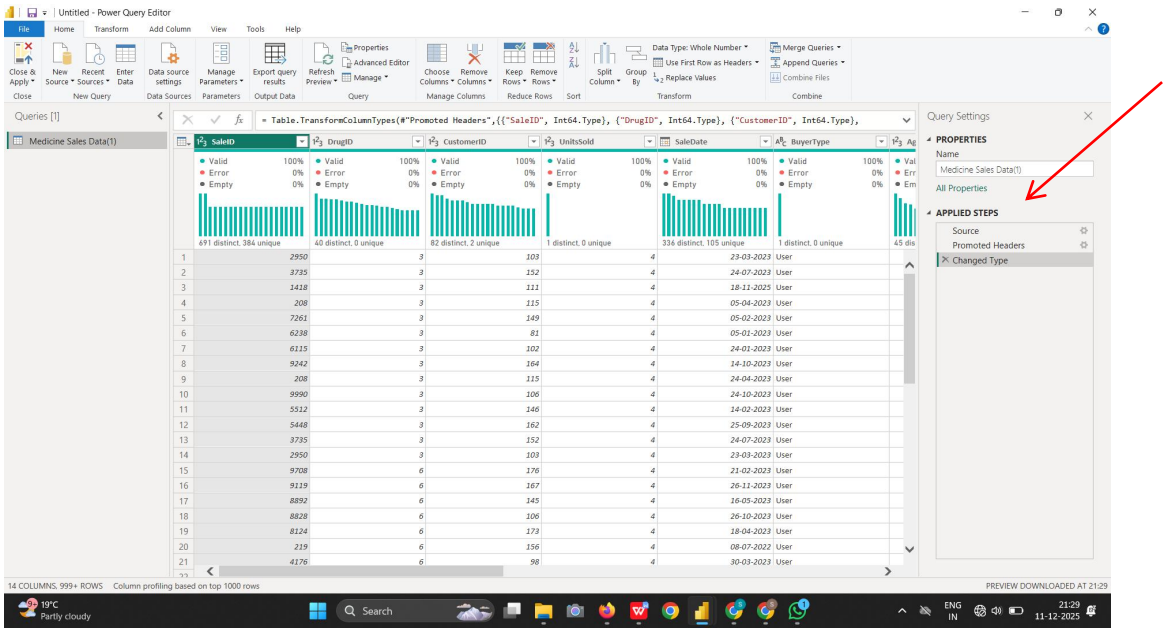


DATA CLEANING:

The Power Query Editor is a tool associated with several Microsoft tools, including Excel, and it serves as your data playground where you can clean and transform your data. If you need to access it after loading your data, you can do so by clicking the Transform Data button in the toolbar.



Now that we're in the Power Query Editor, let's begin cleaning and transforming the data. Here's what it looks like:

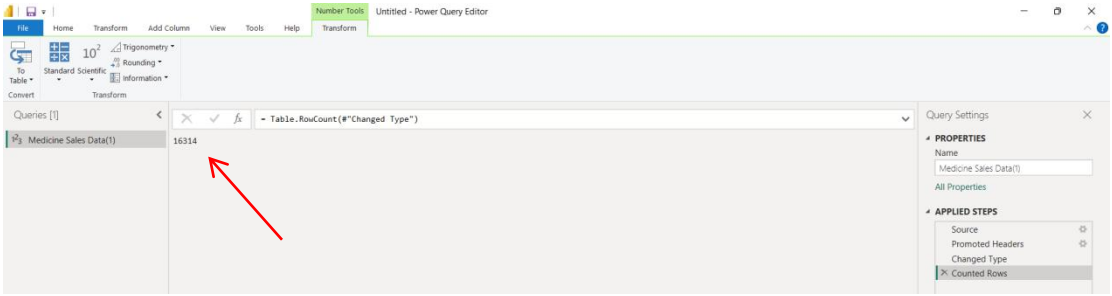


If you look at the "Applied Steps" in the right pane/pipeline , you'll see 3 items, 2 of which are steps that Power BI automatically did for us:

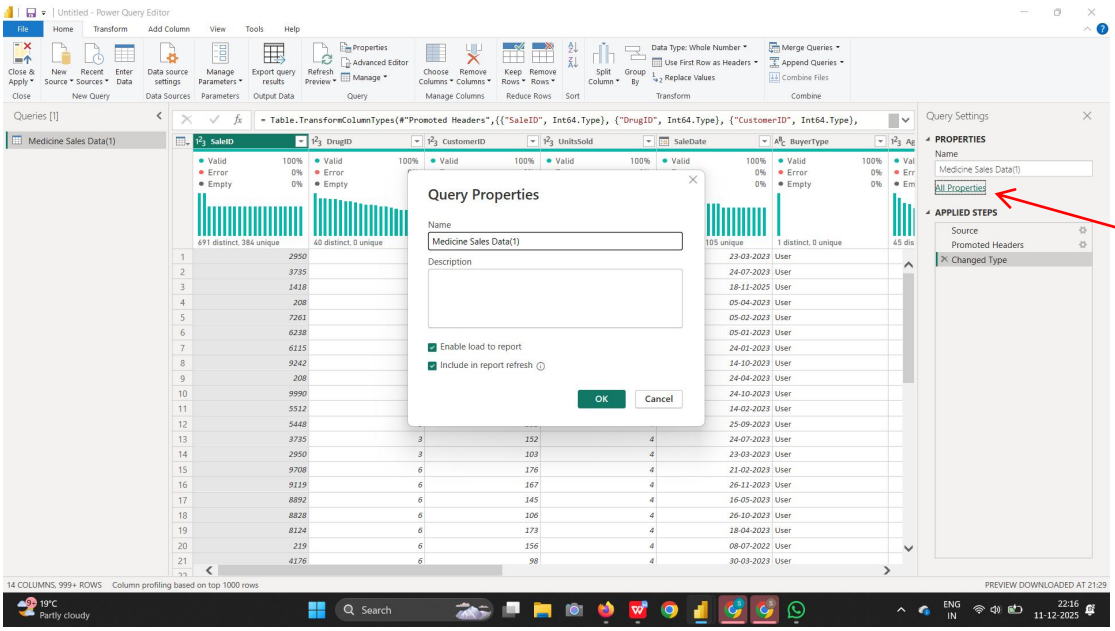
Power Query transformations (step-by-step)

- **Source** — This step holds the M code that connected the file to Power BI.
- **Promoted Headers** — Used the first row as headers. Sometimes the column headers are read as rows of data rather than column names so Power BI automatically corrects that for us, but there is a Use First Row as Headers button that you can select to do this yourself.

- **Changed Type** — This is also automatically done by Power BVI, where the data types for each column are assigned based on Power BI scanning a certain number of rows in your data. We'll come back to this later.
- **Row count** — The dataset contains **16,314 rows** of sales records.
  Each row represents an individual sales transaction, including details such as drug information, customer demographics, pricing, and production cost.



- **Properties**— The dataset contains **16,314 rows and 14 columns**, with each row representing a complete pharmaceutical sales transaction.Write in the properties.

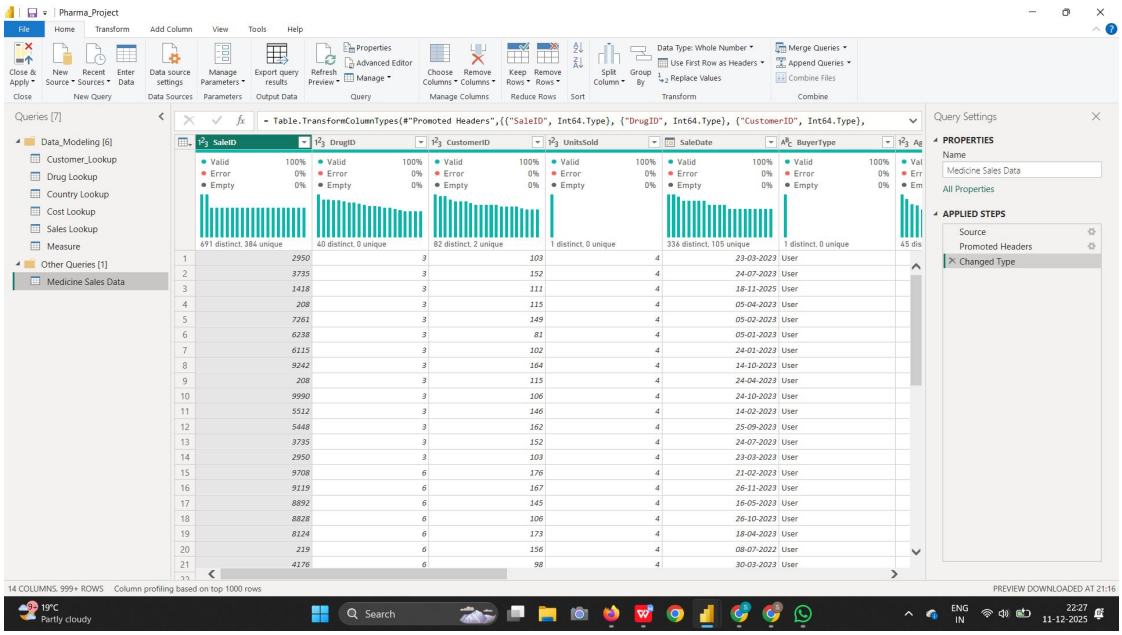


- **Inspect Columns**— Inspect all columns in the dataset to ensure they are correctly named and consistent. Verify that the dataset contains the following columns: TransactionID, Date, CustomerID, CustomerName, BuyerType, Age, Gender, Country, DrugID, DrugName, UnitsSold, UnitPrice, CostPerUnit, and RegulatoryComplianceID. Note that the actual column names in your file may

differ; rename them to these standardized names for consistency and easier analysis.

- **Handle missing & errors**— Remove rows with missing TransactionID or Date using filter → Remove Empty.For numeric nulls, replace null with 0 where appropriate (UnitsSold, UnitPrice, CostPerUnit) using Transform → Replace Values → null → 0.
- **Rename columns**— Right-click each header → Rename. Use the standardized names above.
- **Change data types**—Set Date → Date/Time or Date. CustomerID, DrugID → Text. UnitsSold → Whole Number. UnitPrice, CostPerUnit → Decimal Number.

- **Star-Schema**— Data modeling is the process of organizing and structuring raw data into a clear, logical format that supports efficient storage, analysis, and reporting. It defines how data is connected, how tables relate to each other, and how information flows across the system. In Power BI, data modeling involves creating fact and dimension tables, establishing relationships between them, assigning correct data types, and optimizing the dataset for performance.
- **Create duplicate tables** from the main dataset (Medicine Sales Data) and move them into the Data Modeling view. Rename each duplicate according to its purpose, such as Customer_Lookup, Drug Lookup, Cost Lookup, or any other lookup or analysis table you need. These duplicated and renamed tables will function as your dimension tables in the star schema
- After creating the duplicate tables from the main dataset, check each table for any unwanted or incorrect column names and rename them appropriately. You must also verify and detect the correct data types for every column to ensure accuracy. These cleaned tables will be used as dimension tables (lookups), while the original main table will serve as the fact table.



- **Cleanup of Lookup Tables**

  After creating the lookup (dimension) tables from the main dataset, the next step is to clean and prepare each lookup to ensure accuracy and efficiency in the data model.

  1. Remove Unnecessary Columns

  Open each lookup table (Customer, Drug, Cost,Country, etc.) and delete any columns that are not required for analysis or relationships.
  This keeps the dimension tables clean and reduces model size.

  2. Add Index Columns (If Needed)

  If a lookup table does not have a proper unique identifier, create an **Index Column** from Power Query.
  This helps maintain uniqueness and prevents relationship issues in the star schema.

  3. Remove Duplicate Rows

Use Remove Duplicates in each lookup table (except Saleslookup).
Removing duplicates ensures that each dimension contains only one record per key value.

❗ Important:
Do NOT remove duplicates from the **Sales** table, because the fact table must keep all transactional records. Removing duplicates here would cause data loss.

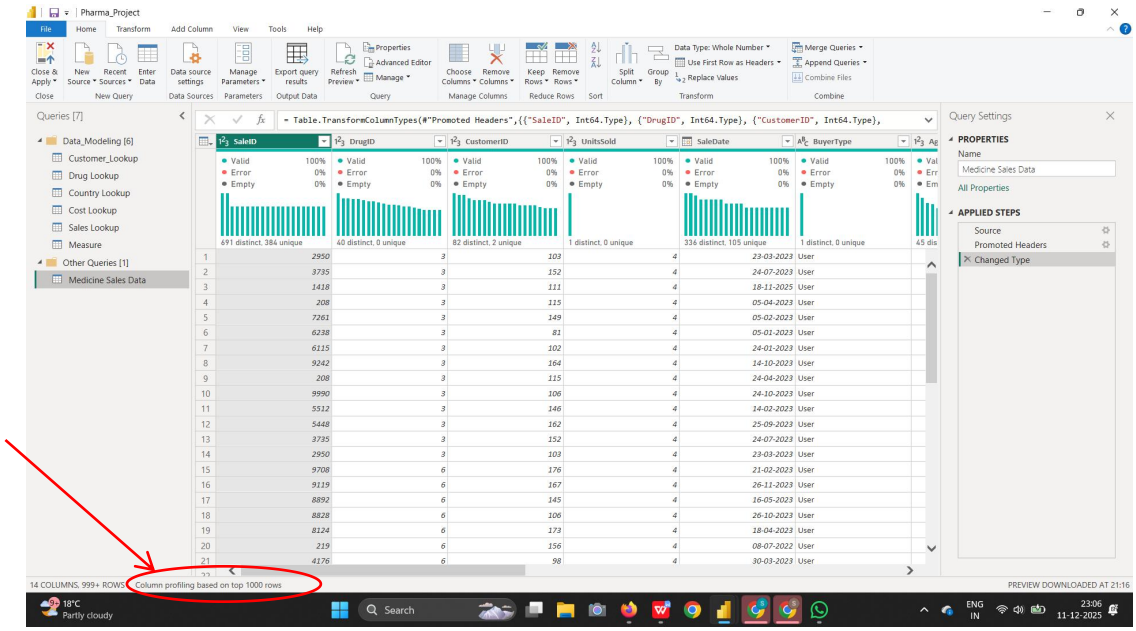
4. Update Properties (Row and Column Count)

- After cleaning each lookup:
- Count the **number of rows**
- Count the **number of columns**

Add these details to your documentation under *Properties*, because it helps validate data accuracy during visualization and modeling.

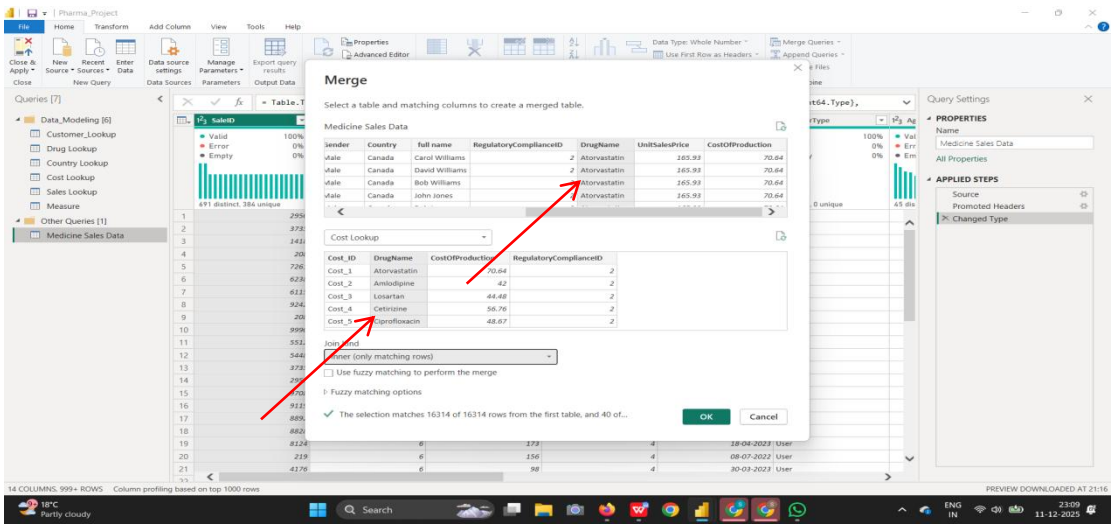
- **Column Profiling Check**

  - After cleaning the main table and all dimension (lookup) tables, the next step is to verify **Column Profiling** in Power Query.
  - Column profiling is shown at the **bottom left** of the Power Query window and helps you understand how Power BI scans your data.
  - Column profiling must be verified on the main fact table and the sales lookup table. Since the dataset contains more than 1,000 rows, profiling should be set to 'Column profiling based on entire dataset' to ensure accurate quality, distribution, and data type validation.



Merge Queries:

- After preparing the lookup tables, the next step is to perform merging. Go to the Power Query ribbon, open the *Combine* section, and select *Merge Queries*. This will open a merge window where you can choose the main table and the lookup table you want to merge with.
- In the merge window, select the matching columns from both tables. Since the lookup tables contain only distinct values, we use an *Inner Join*. The inner join checks for rows that exist in both tables with the same matching values. At the bottom of the merge window, Power BI shows how many matching rows were found. Click *OK* to apply the merge.



- After the merge is complete, a new column containing the merged lookup table will appear at the end of the Sales Lookup or main table. You can expand this column to bring in the required related fields from the lookup

Enable Load

- After completing the merging and lookup preparation steps, recheck the dataset to ensure everything is correct. Then, make sure to enable the load for the main dataset. If the main table is not set to 'Enable Load,' it will not appear in the Model View, and the relationships cannot be created. Therefore, verify that the main table (Fact table) has load enabled so it becomes visible in the data model.

Close & Apply

- After completing all transformations, cleaning, and validation steps in Power Query, proceed to the final step by selecting *Close & Apply*. This will apply all the changes to the data model and load the cleaned tables into Power BI, making them ready for modeling, creating relationships, and building visualizations.

STEP 3:

DATA MODELING (MODEL VIEW)

- Now we move from Power Query into the **Power BI Dashboard (Model View)**.

Once the cleaned tables are loaded:

1. Open Model View

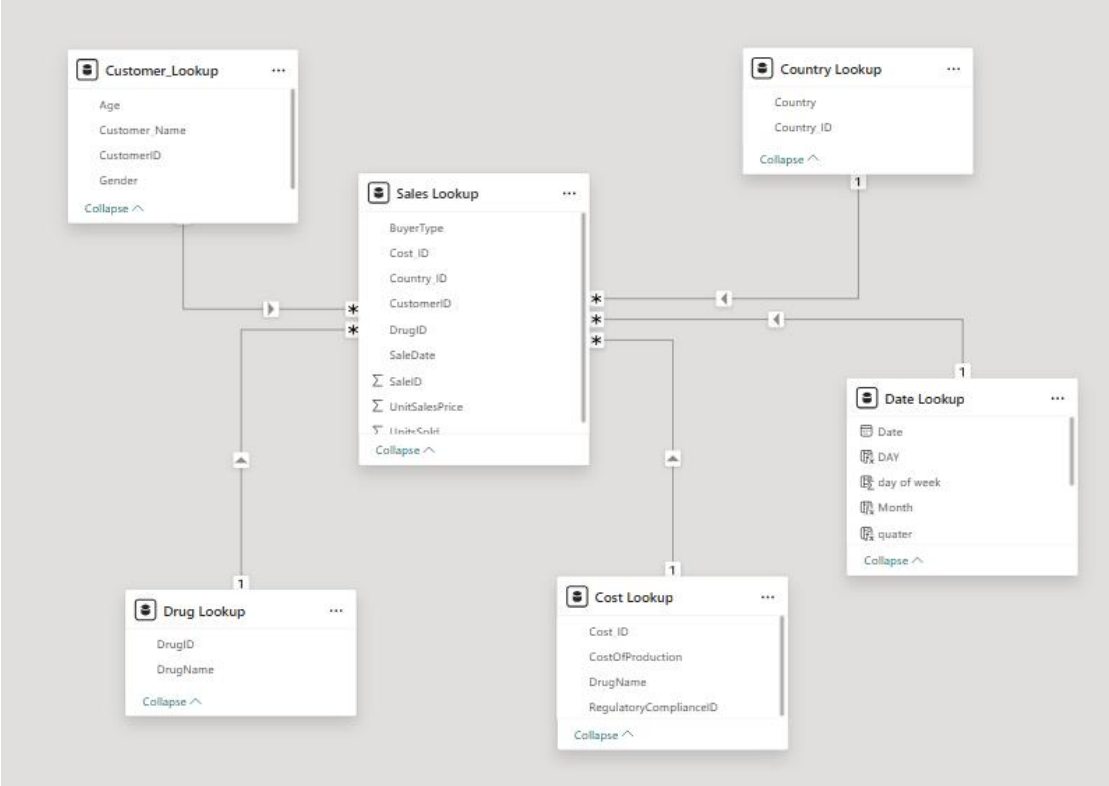
✧ Go to **Model View** in Power BI to see all tables.

2. Check All Relationships

✧ Verify that each dimension table is correctly connected to the Fact table.

➢ FactSales ↔Customer Lookup
➢ FactSales ↔ Drug Lookup

- FactSales ↔ Cost Lookup
- FactSales ↔ Country Lookup



3.Relationship Settings

Ensure each relationship is:

- ✔ **One-to-Many (1*)**
- ✔ **Cross filter direction: Single**
- ✔ **Active relationship: ON**

Now that we understand the transformations that have already been done on the dataset, we can now do our own investigations to see if the data is in the most appropriate state to run a useful analysis.

Date Lookup:

- ✧ The main dataset contains only SalesDate and lacks key calendar fields such as **Year, Month, Quarter, Week, Month Name, Year-Month, and Day**.

✧ To support **advanced time-intelligence** and flexible analytics, a separate **Date Lookup** table is created.

- **YEAR:**

Date Lookup = CALENDAR(MIN('Sales Lookup'[SaleDate]),MAX('Sales Lookup'[SaleDate]))

- **MONTH:**

Month = FORMAT('Date Lookup'[Date],"mmmm")

- **QUARTER:**

quater = CONCATENATE("Q",QUARTER('Date Lookup'[Date]))

- **DAY:**

DAY = FORMAT('Date Lookup'[Date],"DDDD")

- **DAY OF WEEK:**

day of week = WEEKDAY('Date Lookup'[date],2)

- **START OF MONTH:**

Start of month = STARTOFMONTH('Date Lookup'[Date])

- **WEEKEND:**

weekend = if('Date Lookup'[day of week] in {6,7}, "Weekend","Weekday")

- **YEAR MONTH:**

YearMonth = FORMAT([Date], "YYYY-MM")

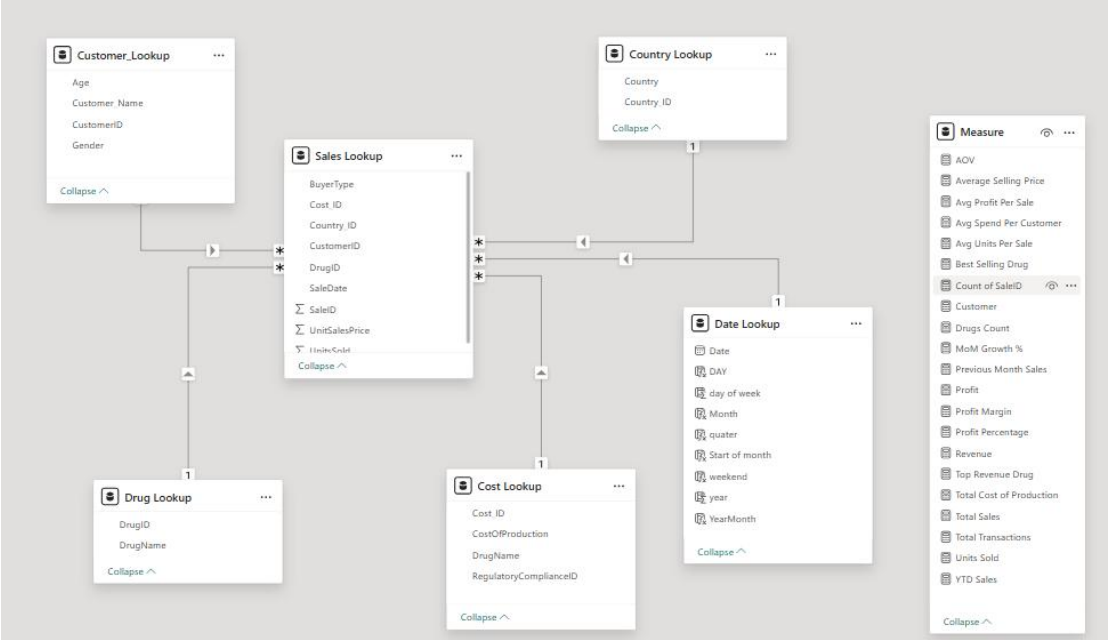
- **START OF MONTH:**

Start of month = STARTOFMONTH('Date Lookup'[Date])

STEP 4:

DAX MEASURES:

1. **Revenue**=SUMX('Sales Lookup','Sales Lookup'[UnitSalesPrice]*'Sales Lookup'[UnitsSold])
2. **Best Selling Drug =** CALCULATE(MAX('Drug Lookup'[DrugName]),TOPN(1, 'Sales Lookup', [Units Sold], DESC))
3. **TopRevenue Drug =** CALCULATE(MAX('Drug Lookup'[DrugName]),TOPN(1, 'Sales Lookup', [Total Sales], DESC))
4. **AOV[Average Order value]** = DIVIDE([Total Sales], [Total Transactions])
5. **Average Selling Price** = AVERAGE('Sales Lookup'[UnitSalesPrice])
6. **Avg Profit Per Sale** = DIVIDE([Profit], [Total Transactions])
7. **Avg Units Per Sale** = AVERAGE('Sales Lookup'[UnitsSold])
8. **Count of SaleID** = COUNT('Sales Lookup'[SaleID])
9. **Customer** = COUNT('Customer Lookup'[CustomerID])
10. **Drugs Count** = DISTINCTCOUNT('Sales Lookup'[DrugID])
11. **MoM Growth %** = DIVIDE([Total Sales] - [Previous Month Sales],[Previous Month Sales])
12. **Previous Month Sales** = CALCULATE([Total Sales], DATEADD('Date Lookup'[Date], -1, MONTH))
13. **Profit** = [Total Sales] - [Total Cost of Production]
14. **Profit Margin** = DIVIDE([Profit], [Total Sales])
15. **Profit Percentage** = DIVIDE([Profit], [Total Cost of Production])
16. **Revenue** = SUMX('Sales Lookup','Sales Lookup'[UnitSalesPrice]*'Sales Lookup'[UnitsSold])
17. **TopRevenue Drug** = CALCULATE(MAX('Drug Lookup'[DrugName]),TOPN(1, 'Sales Lookup', [Total Sales], DESC))
18. **Total Cost of Production** = SUM('Sales Lookup'[CostOfProduction])
19. **Total Sales** = SUMX('Sales Lookup','Sales Lookup'[UnitsSold] * 'Sales Lookup'[UnitSalesPrice])
20. **Total Transactions** = COUNT('Sales Lookup'[SaleID])
21. **Units Sold** = SUM('Sales Lookup'[UnitsSold])
22. **YTD Sales** = TOTALYTD([Total Sales], 'Date Lookup'[Date])



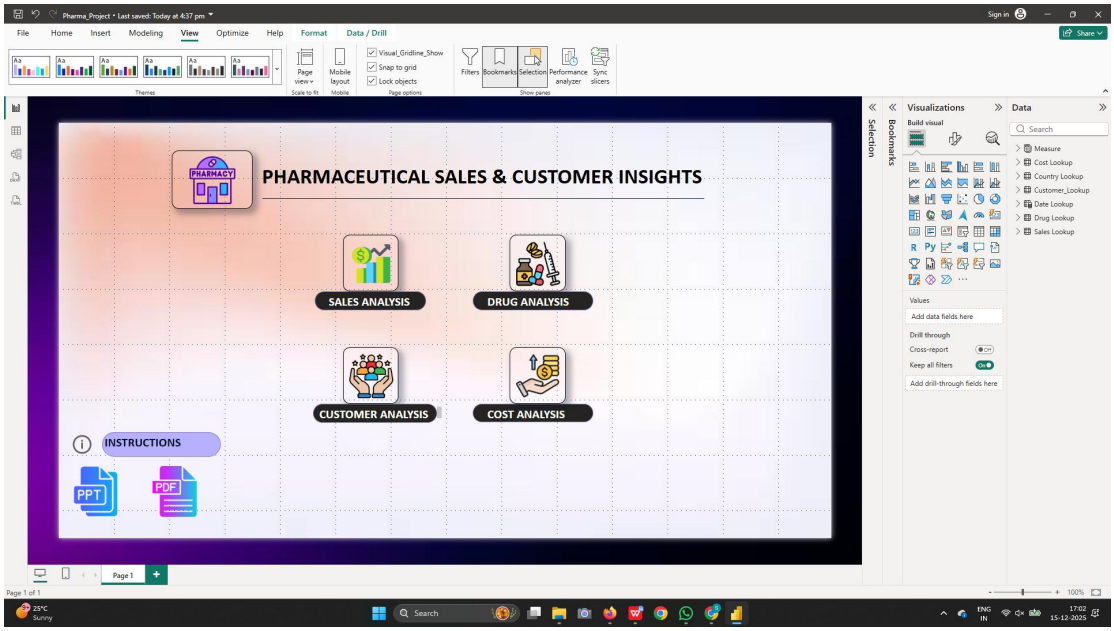
With the data model fully structured and all relationships correctly established, we now move to the **Report View** to design the interactive Pharmaceutical Sales Insights Dashboard. This stage focuses on creating visuals, applying filters, and building an intuitive layout for stakeholders.

STEP 5

REPORT VIEW

1) Choose a Clean Report Layout

- Use a professional theme (colors, fonts, style) OR use images for wallpaper and canvas background.
- Choose better colors for visuals to get professional look
- Keep KPIs at the top for quick insights.



2) Home Page (Navigation Page)

The Home Page serves as the central navigation hub for the Pharmaceutical Sales & Customer Insights Dashboard. It is designed with a clean, modern layout to guide users seamlessly into different analytical sections of the report.

A minimalistic and well-organized layout is applied to ensure a professional user experience.

The landing page uses:

- ✓ A gradient background/canvas for enhanced visual appeal
- ✓ Consistent spacing and alignment using Power BI gridlines
- ✓ Clear section separation for improved readability

A. Professional Visual Design & Iconography

High-quality icons and modern design components are used to represent each analysis module.All icons and labels follow a consistent visual language, maintaining:

- ✓ Uniform color palette
- ✓ Readable typography

- ✓ Modern, flat-style iconography

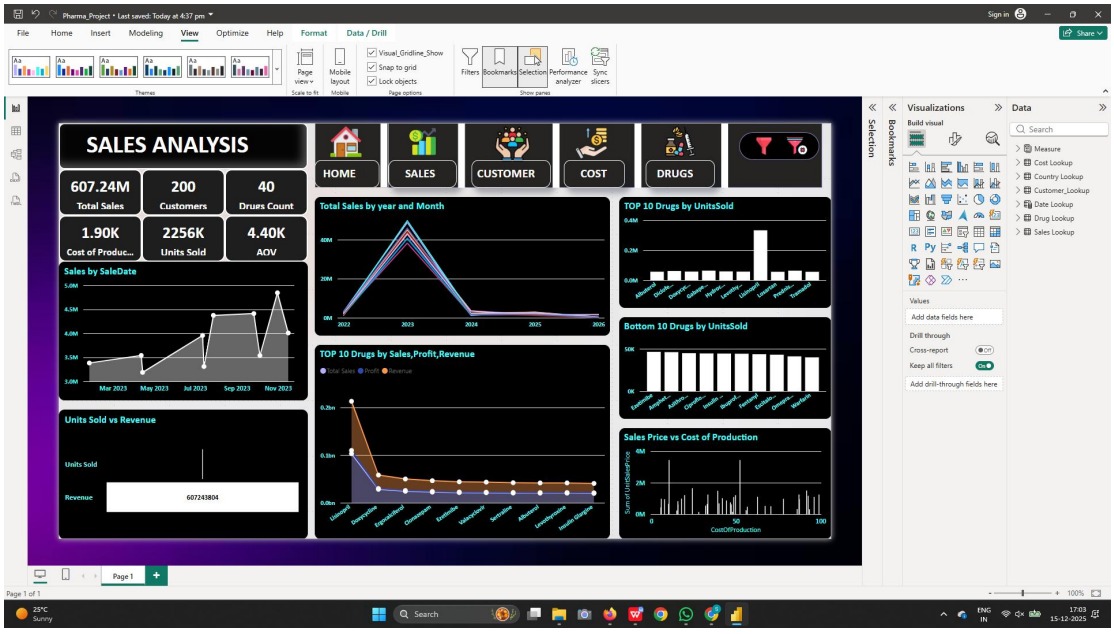
This enhances the aesthetics of the page while making navigation intuitive.

B. User-Friendly Navigation Structure

The navigation buttons on the home page provide direct access to the primary analytical modules:

- ✓ Sales Analysis
- ✓ Drug Analysis
- ✓ Customer Analysis
- ✓ Cost Analysis
- ✓ Instructions

Each section is represented with a labeled icon, enabling clear and intuitive navigation for users of all technical backgrounds.



3) Sales Analysis

The **Sales Analysis dashboard** focuses on evaluating overall sales performance, revenue trends, product-level contribution, and profitability. This page is designed to give stakeholders a quick yet detailed understanding of how pharmaceutical sales are performing over time and across drugs.

A. Key Sales KPIs

The following KPIs are displayed at the top of the Sales Analysis page to provide an instant snapshot of business performance:

Total Sales: Represents total revenue generated from all drug sales.

Total Customers: Total number of unique customers contributing to sales.

Drugs Count: Number of distinct drugs sold.

Cost of Production: Total production cost incurred.

Units Sold: Total quantity of drug units sold.

Average Order Value (AOV): Average revenue generated per transaction.

These KPIs help decision-makers quickly assess revenue scale, volume performance, and customer impact.

B. Sales Trend Analysis (Sales by Date)

A **line/area chart** is used to visualize sales performance over time.

The X-axis represents the sales date (month/year), and the Y-axis represents total sales.

This visual helps identify:

- ✓ Seasonal demand patterns
- ✓ Sudden spikes due to promotions or high demand
- ✓ Sales drops that may indicate supply or pricing issues

Trend analysis supports forecasting, inventory planning, and strategic decision-making.

C. Total Sales by Year and Month

A **multi-line chart** compares total sales across multiple years.

Each line represents a different year, plotted across months.

Enables:

- ✓ Year-over-year performance comparison
- ✓ Identification of peak and low-performing periods
- ✓ Long-term sales growth evaluation

This visual is especially useful for management-level performance reviews.

D. Top 10 Drugs by Units Sold

A **bar chart** displays the top 10 drugs based on units sold.

Helps identify high-demand drugs driving volume.

Useful for:

- ✓ Inventory optimization
- ✓ Production planning
- ✓ Demand forecasting

High unit sales may not always mean high profitability, so this chart is often analyzed alongside profit visuals.

E. Bottom 10 Drugs by Performance

This chart highlights drugs with the lowest sales or unit performance.

Helps identify:

- ✓ Underperforming products
- ✓ Drugs requiring pricing, marketing, or production review
- ✓ Candidates for discontinuation or repositioning

This insight helps reduce losses and optimize the product portfolio.

F. Top 10 Drugs by Sales, Profit, and Revenue

A **combined line chart** compares sales, revenue, and profit for the top 10 drugs.

Enables comparison between:

- ✓ High-revenue but low-margin drugs
- ✓ Low-volume but high-profit drugs

This analysis supports strategic decisions around pricing, cost control, and promotional focus.

G. Units Sold vs Revenue

A KPI-style or comparison visual shows the relationship between units sold and revenue.

Helps determine whether revenue growth is driven by:

- ✓ Higher sales volume
- ✓ Higher pricing strategies

This insight is critical for balancing pricing and volume-based sales strategies.

H. Sales Price vs Cost of Production

A **pie chart** visually compares total sales price against total cost of production.

Clearly highlights profit contribution.

Helps stakeholders:

- ✓ Understand cost efficiency
- ✓ Monitor margin health
- ✓ Identify cost-heavy production areas

I. Business Insights from Sales Analysis

High-performing drugs contribute disproportionately to total revenue.

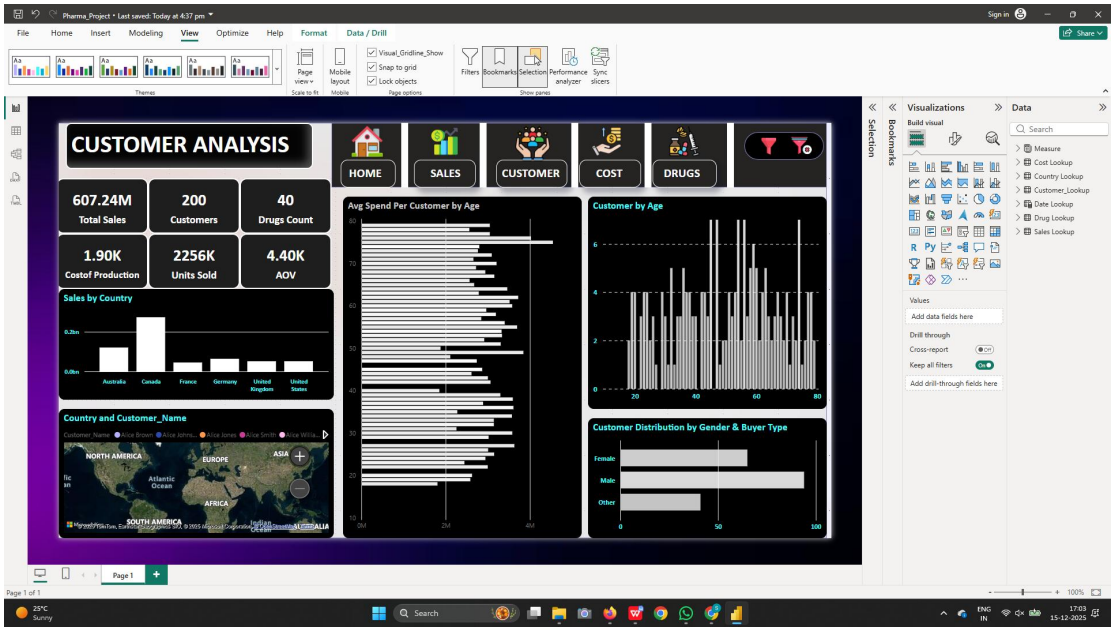
Certain drugs show strong volume but lower margins, indicating pricing or cost optimization opportunities.

Seasonal trends indicate predictable demand cycles.

Cost vs sales comparison highlights profitability gaps across products.

Conclusion

The Sales Analysis dashboard provides a comprehensive and actionable view of pharmaceutical sales performance. By combining KPIs, trend analysis, product-level insights, and profitability visuals, the dashboard enables stakeholders to monitor performance, identify risks, and make informed strategic decisions to improve revenue growth and operational efficiency.



4. Customer Analysis:

The **Customer Analysis** dashboard provides a comprehensive view of customer demographics, segmentation, and behavioral patterns. It combines demographic indicators, spending trends, and geographic insights to help identify high-value segments and optimize sales strategies.

A. Age Segmentation

The **Customer by Age** visual highlights how customers are distributed across age groups.

- Insights from the age distribution help identify major buyer clusters and age segments contributing most to overall purchases.

- The **Avg Spend per Customer by Age** chart further reveals which age groups generate higher average revenue, helping to pinpoint high-value age segments.

B. Gender Segmentation

- The **Customer by Gender** chart shows a breakdown of customers by gender categories.
- This helps assess which gender groups are more actively purchasing pharmaceutical products.
- Understanding gender-based patterns supports targeted marketing and customized sales strategies.

C. Customer Type Segmentation

- Although not directly shown, the dashboard is built to support segmentation by buyer type (e.g., individual customer, retailer, clinic/hospital).
- This segmentation aids in identifying which buyer category contributes most to the business.

D. Customer Spending Behavior

The **Avg Spend Per Customer by Age** visual provides insights into customer value across age groups.

- Certain age ranges demonstrate higher spending levels, indicating stronger purchasing power or higher medical needs.
- Identifying these high-value age groups helps in targeted customer retention and personalized marketing campaigns.

E. **Geographic Distribution & Market Penetration**

The dashboard includes detailed geographic visuals to evaluate customer presence and sales contribution across different countries.

Country-Level Insights

- The **Sales by Country** bar chart shows revenue contribution from major countries such as Canada, Australia, Germany, the United States, the United Kingdom, and France.
- This helps in identifying strong-performing markets and regions with growth potential.

Interactive Map Visualization

- The **Country Map Visual** provides an intuitive geographical representation of customer locations.
- It helps in understanding market penetration and identifying region-specific opportunities for expansion.

F. Key KPIs for Customer Insights

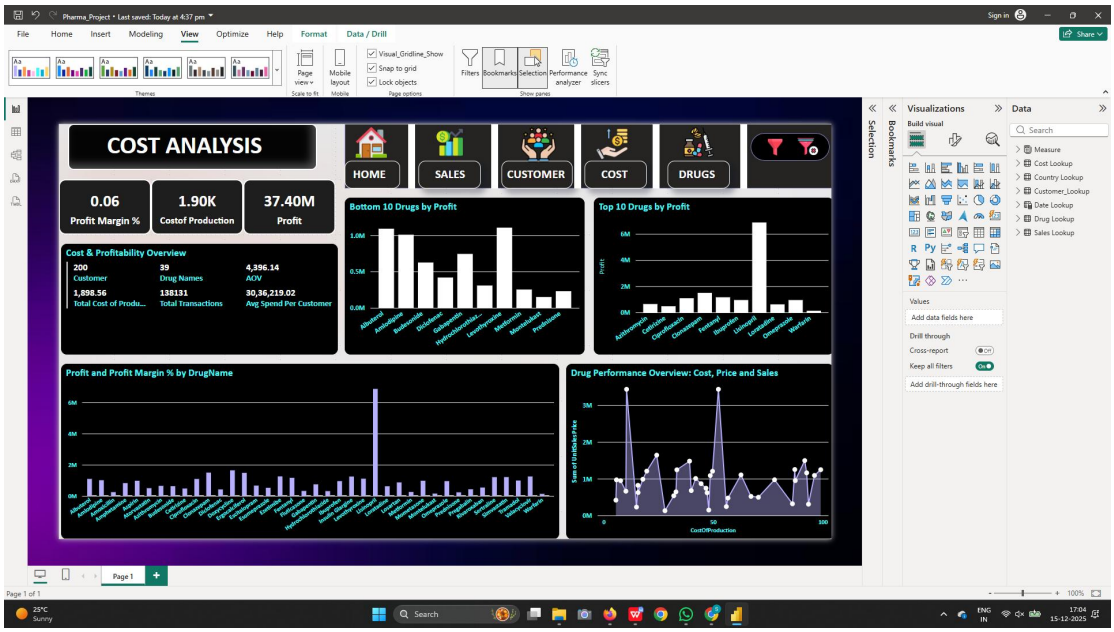
Positioned at the top of the page, these KPIs provide a quick overview of customer-driven performance:

- ✓ Total Sales
- ✓ Number of Customers
- ✓ Drugs Count
- ✓ Cost of Production
- ✓ Units Sold
- ✓ AOV (Average Order Value)

These indicators give an immediate snapshot of overall customer impact on business performance.

Conclusion:

The Customer Analysis dashboard delivers actionable insights across demographic, behavioral, and geographic dimensions. By understanding customer age groups, gender distribution, spending habits, and regional presence, the business can make informed decisions on product positioning, marketing strategies, and customer engagement initiatives.



5. Cost Analysis

The **Cost Analysis page** focuses on understanding production cost behavior, profitability, and margin efficiency for pharmaceutical drugs. Below is the detailed documentation for **each visual** present on the Cost Analysis page.

A. KPI Card – Total Sales

Visual Type: Card
Description: Displays the overall revenue generated from all drug sales.
Purpose: Provides business context for cost and profitability evaluation.
Business Insight: Helps compare total revenue against total production cost.

B. KPI Card – Cost of Production

Visual Type: Card
Description: Shows the total cost incurred in producing all drugs.
Purpose: Acts as the primary metric for cost monitoring.
Business Insight: Higher cost values indicate pressure on profit margins if pricing is not optimized.

C. KPI Card – Drugs Count

Visual Type: Card
Description: Displays the number of distinct drugs analyzed.
Purpose: Indicates product portfolio size.
Business Insight: Helps understand cost and profit distribution across multiple drugs.

D. Sales Price vs Cost of Production

Visual Type: Comparison / KPI Card
Metrics Used: Sum of Unit Sales Price, Sum of Cost of Production
Purpose: Directly compares revenue against production cost.
Business Insight: Highlights the overall profitability gap and pricing effectiveness.

E. Top 10 Drugs by Profit Margin

Visual Type: Column Chart
X-axis: Drug Name
Y-axis: Profit Margin
Purpose: Identifies the most profitable drugs.

Business Insight: These drugs deliver maximum return relative to cost and are ideal candidates for scaling and promotion.

F. Bottom 10 Drugs by Profit Margin

Visual Type: Column Chart
X-axis: Drug Name
Y-axis: Profit Margin
Purpose: Highlights drugs with the lowest margins.
Business Insight: Indicates underperforming drugs that may require cost reduction, repricing, or discontinuation.

G. Profit and Profit Margin by Drug Name

Visual Type: Column Chart
Metrics Used: Profit, Profit Margin
Purpose: Shows both absolute profit and margin percentage per drug.
Business Insight: Helps differentiate high-revenue but low-margin drugs from genuinely profitable ones.

H. Cost vs Sales vs Units Sold

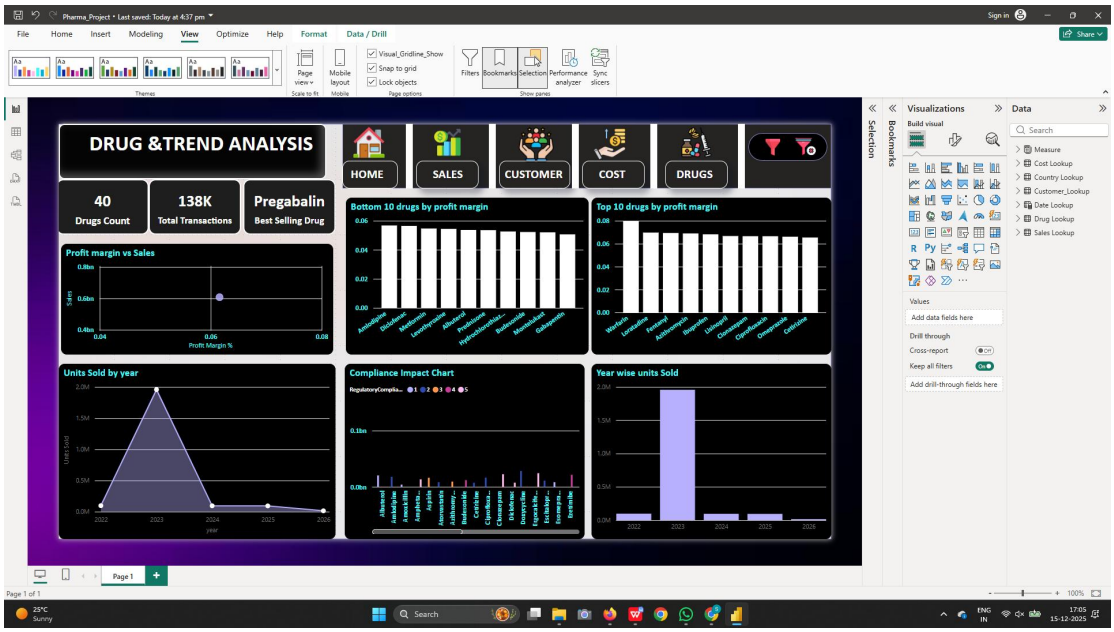
Visual Type: Scatter / Bubble Chart
Metrics Used: Cost of Production, Unit Sales Price, Units Sold
Purpose: Analyzes the relationship between cost, pricing, and sales volume.
Business Insight: Identifies inefficient drugs with high cost and low return, supporting optimization decisions.

I. Overall Insights – Cost Analysis Page

- ✓ High-margin drugs demonstrate effective pricing and cost control.
- ✓ Some drugs show strong sales but weak margins due to high production costs.
- ✓ Bottom-margin drugs represent opportunities for strategic cost optimization.

Conclusion – Cost Analysis

The Cost Analysis dashboard fully addresses the profitability and cost-related problem statement by comparing production costs with unit sales prices and identifying both high-performing and underperforming drugs. These insights enable informed pricing, cost optimization, and product strategy decisions.



6. Drug & Trend Analysis

This document provides a professional explanation of each visual present on the **Drug & Trend Analysis** dashboard. It is intended for project reviews, interviews, stakeholder presentations, and portfolio documentation.

A. KPI Cards

Drug Count

Purpose: Displays the total number of unique drugs analyzed in the dataset.

Business Value:

- ✓ Helps stakeholders understand the breadth of the product portfolio.
- ✓ Useful for tracking expansion or reduction in drug listings over time.

Total Transactions

Purpose: Represents the total number of sales transactions recorded.

Business Value:

- ✓ Indicates overall market activity and demand.
- ✓ Acts as a base metric for performance comparison across periods.

Best Selling Drug

Purpose: Highlights the drug with the highest sales volume or revenue.

Business Value:

- ✓ Identifies top-performing products.
- ✓ Helps prioritize inventory, marketing, and distribution strategies.

B. Profit Margin vs Sales (Scatter Plot)

Purpose: Shows the relationship between profit margin and sales performance.

Insights Enabled:

- ✓ Identifies high-sales but low-margin drugs.
- ✓ Highlights low-sales but high-margin opportunities.

Business Value:

- ✓ Supports pricing strategy optimization.
- ✓ Helps balance revenue growth with profitability.

C. Bottom 10 Drugs by Profit Margin (Bar Chart)

Purpose: Displays the drugs with the lowest profit margins.

Insights Enabled:

- ✓ Detects underperforming or cost-heavy drugs.
- ✓ Highlights candidates for cost optimization or discontinuation.

Business Value:

- ✓ Enables proactive margin improvement decisions.
- ✓ Supports vendor negotiation and pricing adjustments.

D. Top 10 Drugs by Profit Margin (Bar Chart)

Purpose: Identifies the most profitable drugs based on margin percentage.

Insights Enabled:

- ✓ Recognizes high-value products.
- ✓ Highlights drugs suitable for promotional focus.

Business Value:

- ✓ Guides strategic investment and marketing campaigns.
- ✓ Improves profitability-focused decision-making.

E. Units Sold by Year (Line / Area Chart)

Purpose: Shows year-wise sales volume trends.

Insights Enabled:

- ✓ Detects growth, decline, or seasonality patterns.
- ✓ Compares performance across multiple years.

Business Value:

- ✓ Supports demand forecasting.
- ✓ Helps align production and inventory planning.

F. Compliance Impact Chart (Column Chart)

Purpose: Measures the impact of regulatory compliance on drug sales or performance.

Insights Enabled:

- ✓ Identifies drugs affected by compliance changes.
- ✓ Highlights risks related to regulation.

Business Value:

- ✓ Supports regulatory risk assessment.
- ✓ Helps ensure sustainable and compliant product strategies.

G. Year-wise Units Sold (Bar Chart)

Purpose: Compares total units sold across different years.

Insights Enabled:

- ✓ Provides a clear year-over-year performance comparison.

- ✓ Identifies peak and low-performing years.

Business Value:

- ✓ Assists in long-term strategic planning.
- ✓ Helps evaluate market growth and stability.

H.Overall Dashboard Value

The **Drug & Trend Analysis Dashboard** provides a comprehensive view of:

- ✓ Sales performance
- ✓ Profitability trends
- ✓ Product-level insights
- ✓ Regulatory impact

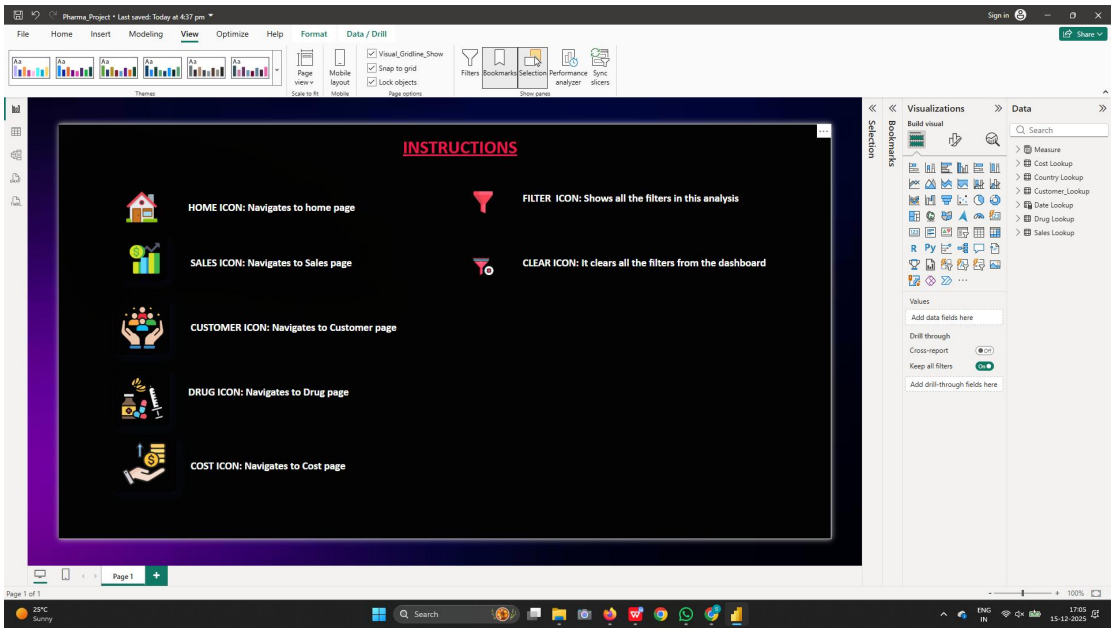
This dashboard enables data-driven decision-making for sales optimization, profitability improvement, and compliance management in the pharmaceutical domain.

Conclusion

The **Drug & Trend Analysis Dashboard** effectively transforms complex pharmaceutical sales and compliance data into clear, actionable insights. By combining high-level KPIs with detailed visual analysis, the dashboard enables stakeholders to quickly understand overall performance, identify profitable and underperforming drugs, monitor sales trends over time, and assess the impact of regulatory compliance.

This dashboard supports **data-driven decision-making** by helping business users optimize pricing strategies, improve profitability, plan inventory efficiently, and manage regulatory risks proactively. Overall, it serves as a reliable analytical tool for

strategic planning, operational improvement, and performance monitoring within the pharmaceutical domain.



7. Instructions Page Documentation

Purpose of the Instructions Page

The **Instructions Page** is designed to guide users on how to interact with the dashboard efficiently. It ensures first-time and non-technical users can easily understand navigation icons, filter controls, and page-level functionalities without external help.

Navigation Icons Explanation

1. Home Icon

Function: Navigates the user back to the Home page.

Usage Value:

- ✓ Provides quick access to the main overview page.
- ✓ Improves overall user navigation experience.

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2. Sales Icon

Function: Navigates to the Sales Analysis page.

Usage Value:

- ✓ Allows users to analyze revenue, sales trends, and performance metrics.
- ✓ Helps sales teams quickly move between analysis sections.

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3. Customer Icon

Function: Navigates to the Customer Analysis page.

Usage Value:

- ✓ Enables insights into customer behavior and segmentation.
- ✓ Supports customer-focused decision-making.

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4. Drug Icon

Function: Navigates to the Drug Analysis page.

Usage Value:

- ✓ Helps analyze drug-level sales, profitability, and trends.
- ✓ Assists in product performance evaluation.

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5. Cost Icon

Function: Navigates to the Cost Analysis page.

Usage Value:

- ✓ Enables monitoring of cost structure and expense trends.
- ✓ Supports profitability and cost optimization analysis.

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6. Filter Controls Explanation

Filter Icon (Show Filters)

Function: Displays all available filters used in the dashboard analysis.

Usage Value:

- ✓ Allows users to slice data by relevant dimensions.
- ✓ Enhances interactive analysis and exploration.

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7. Clear Icon (Reset Filters)

Function: Clears all applied filters from the dashboard.

Usage Value:

- ✓ Quickly resets the dashboard to its default view.
- ✓ Saves time during repeated analysis scenarios.

Overall Page Value

The **Instructions Page** improves dashboard usability, reduces user confusion, and enhances adoption by clearly explaining navigation and interaction elements. It acts as a self-help guide, making the dashboard more intuitive, professional, and user-friendly.

Final Conclusion

The **Pharmaceutical Sales & Customer Insights Dashboard** successfully delivers a complete, end-to-end analytical solution by transforming raw pharmaceutical sales data into meaningful, actionable business insights. The project effectively addresses the core business challenges outlined in the problem statement, including sales performance evaluation, customer segmentation, profitability analysis, regulatory compliance impact, and time-based trend analysis.

By implementing a well-structured **star schema data model**, a dedicated **date lookup table**, and optimized **DAX measures**, the dashboard ensures high performance, accuracy, and scalability. The use of interactive visuals, KPI indicators, and drill-down capabilities allows stakeholders to quickly identify top-performing drugs, underperforming products, high-value customer segments, and cost optimization opportunities.

In addition, the inclusion of a dedicated **Instructions Page** enhances usability and ensures smooth navigation for both technical and non-technical users, making the dashboard intuitive and user-centric. Overall, this project demonstrates strong analytical thinking, sound data modeling practices, and professional dashboard design,

making it suitable for **enterprise-level pharmaceutical analysis**, strategic decision-making, and real-world business applications.