END-TO-END RETAIL PERFORMANCE AND BEHAVIORAL ANALYTICS

-T. ABHINAV

TABLE OF CONTENTS:

INTRODUCTION

Company Name: RetailNova Inc.

Industry: Retail & E-Commerce

Founded: 2016

Headquarters: Chicago, USA

Sales Channels: Online platform, 60+ physical stores across 8 regions.

RetailNova Inc. is a mid-sized retail company that sells a wide range of consumer products including electronics, apparel, home & kitchen, and personal care items. The company operates both online and offline channels, giving customers the flexibility to shop from anywhere.

Over the last few years, RetailNova has experienced rapid growth in online orders, especially during the pandemic.

PROBLEM STATEMENT

However, recent quarters have seen increased product returns, customer churn, and declining profitability in certain regions and product categories.

To maintain its market position and plan for the next growth phase, RetailNova's leadership wants to become more data-driven in its decision-making.

OBJECTIVES

The primary objectives of this project are:

- Identify key sales trends and anomalies
- Understand customer behavior and segmentation
- Optimize product performance and inventory
- Improve store and regional profitability
- Support decision-making through data visualization

METHODOLOGY

The methodology outlines the step-by-step process followed in the project, from data collection to final analysis and visualization. It ensures a structured approach to achieve the project's objectives by using various tools and techniques.

1. Data Cleaning:

The First step is **Data cleaning**. The goal of this phase is to ensure the dataset is free from errors, missing values, and irrelevant information.

Cleaning Steps:

- Removing the Duplicates.
- Replacing the missing values with relevant placeholders.
- Adding the new columns like Profit and Age Group.
- Run the basic EDA (Exploratory Data Analysis) using python.

Tools Used: Jupyter Notebook

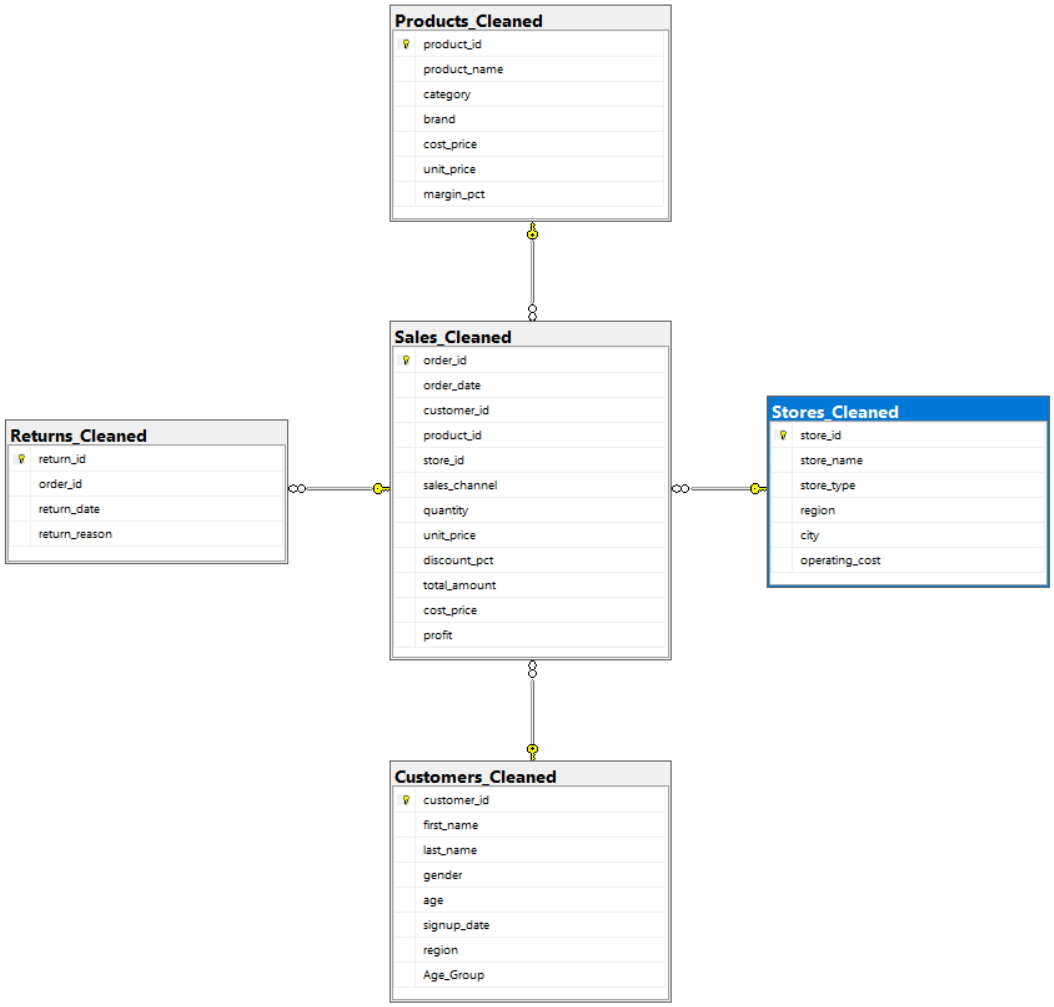
2. SQL Analysis:

With a clean dataset, the next step is analysis using Sql, Through SQL, organizations can track performance, discover trends, understand customer behavior, and identify what drives profits or causes losses.

Tools Used: SQL Server Management System (SSMS)

SQL is used to solve the business questions:

1. What is the total revenue generated in the last 12 months?
2. Which are the top 5 best-selling products by quantity?
3. How many customers are from each region?
4. Which store has the highest profit in the past year?
5. What is the return rate by product category?
6. What is the average revenue per customer by age group?
7. Which sales channel (Online vs In-Store) is more profitable on average?
8. How has monthly profit changed over the last 2 years by region?
9. Identify the top 3 products with the highest return rate in each category.
10. Which 5 customers have contributed the most to total profit, and what is their tenure with the company?



3.Data Visualization:

It helps people quickly understand patterns, trends, and relationships that might stay hidden in raw data.

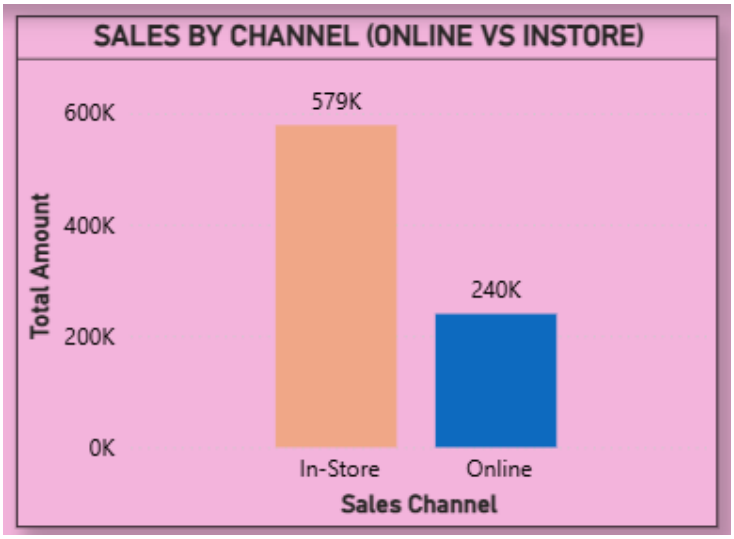
Data visualization also makes communication easier, turning complex insights into simple stories that everyone in a business can understand and act on. In short, data visualization transforms data into a visual language that drives smarter, faster, and more confident decisions.

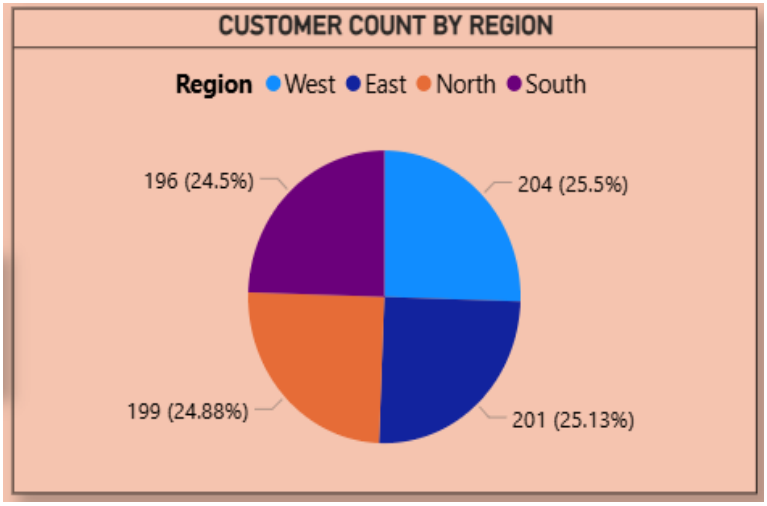
Tools Used: Power BI

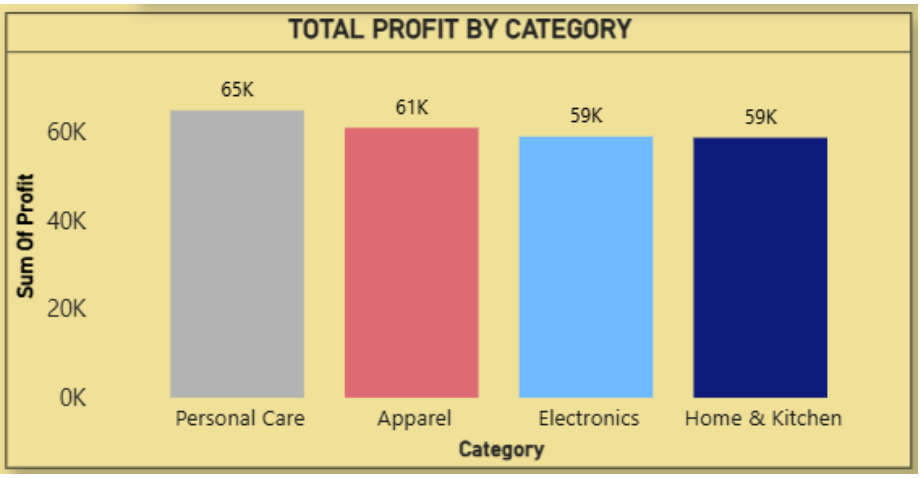
Creating an interactive dashboard that includes:

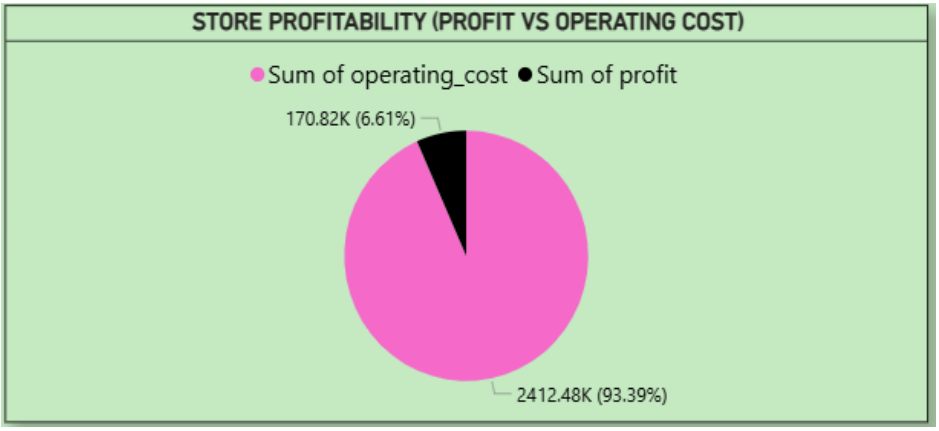
1. Sales Overview Report
2. Customer Insights Report
3. Product Performance Report
4. Store Analysis Report
5. Return Analysis Report

Few Reports:






TOTAL PROFIT BY CATEGORY
65K
61K
59K
59K
60K
40K
20K
0K
Sum Of Profit
Personal Care
Apparel
Electronics
Home & Kitchen
Category


STORE PROFITABILITY (PROFIT VS OPERATING COST)
Sum of operating_cost
Sum of profit
170.82K (6.61%)
2412.48K (93.39%)

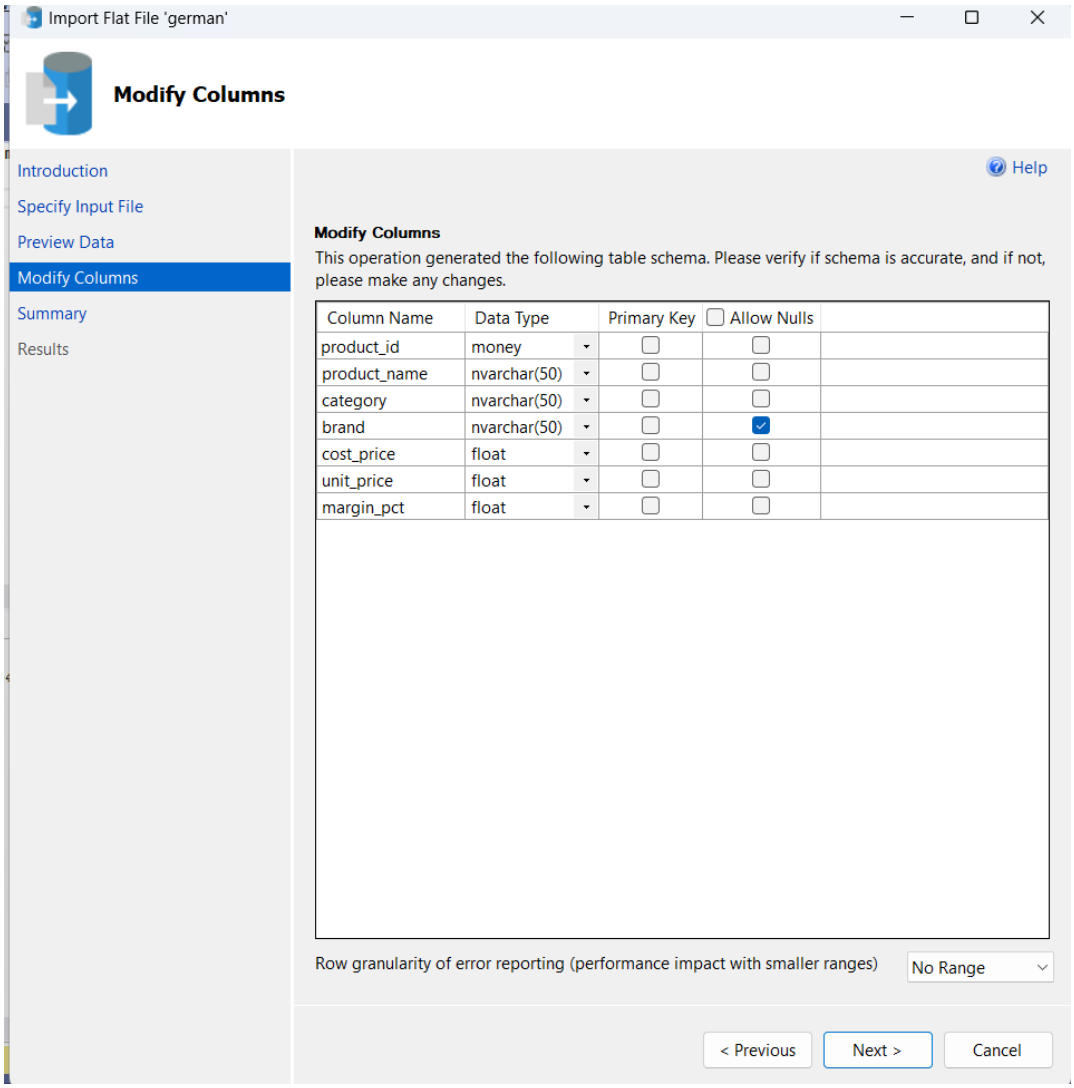
KEY FINDINGS

- Return_rate is more in Home & Kitchen Category and we can also observe that profit is low in Home & Kitchen Category
- Majority of the profit are coming through Personal Care Category
- Online sales are much lower than Store Sales

KEY INSIGHTS

- Decreasing the return_rate by concentrating more on return_reasons.
- Consider improving the sales of Personal Care more in order to get more profits.
- For more Revenue, they need to expand the online sales.

CHALLENGES FACED



During the data import from Excel/CSV into SQL Server, a few columns (such as *Product_id*, *Quantity*, etc.) were automatically detected and assigned as money or time data types instead of numeric.

Because of this:

- Values did not display correctly
- Query execution failed on those fields

CONCLUSION

The dashboard helped to summarize key patterns such as top-performing categories, customer trends, and monthly variations. The visualizations made it easier to identify which areas are strong and where improvements can be made. Overall, the reports provided a meaningful overview of the dataset and supported data-driven decision making in a simple and effective way.

REFERENCES

- **Data Sources:** customers, sales, products, return, store csv files.
- **Tools Used:** Python (Jupyter Notebook), SSMS, Power BI.