COFFEE SHOP SALES ANALYSIS

The domain of the Project:
Power BI and SQL

Under the guidance of
Ms. Siddhika (Software Engineer)

By:
Ms. Anjali A S (B.Tech CSE Graduate)

Period of the project

May 2024 to August 2025

Declaration

The project titled "**Coffee Shop Sales Analysis"** has been mentored by Ms. Siddhika, organised by SURE Trust, from May 2025 to August 2025, for the benefit of the educated unemployed rural youth for gaining hands-on experience in working on industry relevant projects that would take them closer to the prospective employer. I declare that to the best of my knowledge the members of the team mentioned below, have worked on it successfully and enhanced their practical knowledge in the domain.

Name

Ms. Anjali A S

Mentor
Software Engineer—HCL Tech

Prof. Radhakumari
Executive Director & Founder
SURE Trust

Table of contents

Executive Summary

This project presents a **Coffee Sales Dashboard** developed in Power BI to analyse and visualize sales performance across multiple dimensions, including location, product categories, time trends, and profitability. The primary objective was to transform raw sales data into clear, actionable insights that can guide business decisions in retail coffee operations.

The dashboard provides an integrated view of key performance indicators (KPIs**)** such as total sales quantity, overall sales amount, monthly and daily averages, enabling stakeholders to quickly assess business health. It also breaks down performance by store location, product category, product detail, and time (day, week, month), allowing managers to identify high-performing areas and improvement opportunities.

Key findings include:

- Overall Performance: The business achieved 214K sales quantity and 699K total sales amount, with a strong monthly average of 116K and a daily average of 4K.

- Store Location Performance: Sales were concentrated in Hell's Kitchen (237K), Astoria (232K), and Lower Manhattan (230K), showing consistent demand across top outlets.

- Time-Based Trends: Sales grew steadily month-on-month, reaching a peak of 166K in month 6, while profit margins improved from 12% to 24%, indicating rising operational efficiency. Weekly analysis highlighted Mondays as the strongest sales day, with engagement gradually declining toward Sundays.

- Product Insights: Coffee (270K) and Tea (196K) dominated category sales, while specialty items like Sustainably Grown Coffee and Dark Chocolate Latte (21K each) were top-performing individual products.

- Daily Sales Volatility: Sales fluctuated between 19K and 26K per day, with peaks observed around the 7th, 11th, and 15th of the month.

These insights demonstrate the value of business intelligence in monitoring performance, identifying profitable segments, and addressing weaker areas.

In today's competitive retail environment, data-driven decision-making is a critical factor in sustaining growth and profitability. Coffee shops and retail chains generate large amounts of sales data across products, locations, and time periods. However, without proper analysis, this raw data provides limited value to managers and decision-makers.

The Coffee Sales Dashboard Project was undertaken to transform raw sales data into meaningful business insights through the use of Power BI. By integrating key metrics into interactive dashboards, the project provides a clear overview of performance and enables detailed exploration of sales trends, customer preferences, and profitability.

Background and Context

The retail coffee sector is highly dynamic, with customer demand influenced by location, seasonality, and product preferences. Understanding these patterns is vital for improving product offerings, managing inventory, and optimizing store operations. This project leverages business intelligence techniques to reveal patterns in sales quantity, revenue generation, and product category performance.

Problem Statement / Goals

Retail businesses often struggle to interpret large volumes of sales transactions spread across multiple outlets and product categories. The absence of a structured reporting system makes it difficult to identify which stores, products, or time periods drive the most value. Without this knowledge, opportunities for optimization and growth remain underutilized.

Scope

This project focuses on descriptive analytics using Power BI dashboards. It analyzes historical coffee sales data to highlight:

- Sales performance across store locations

- Contribution of product categories and individual products

- Monthly and weekly sales trends, including margins and average sales

- Identification of best-performing and underperforming areas

Innovation Component

The innovation in this project lies in designing an integrated Power BI dashboard that combines KPIs, location-based sales, product analysis, and time-based trends into a single view. The dashboard enables stakeholders to move from intuition-driven decisions to evidence-based strategies, providing both a high-level overview and detailed drill-down capabilities.

Objectives and Goals

- Analyse sales performance across multiple dimensions
  - Evaluate sales quantity, sales amount, and average sales over different time periods to provide a comprehensive picture of business performance.
- Identify high-performing store locations and areas for improvement
  - Compare store-level contributions to total revenue and identify outlets with consistently strong or weak performance.
- Understand product-level and category-level performance
  - Highlight top-selling products and categories, enabling managers to refine product mix, focus on customer preferences, and optimize inventory management.
- Evaluate time-based sales patterns
  - Track monthly, weekly, and daily sales trends to identify peak periods of customer demand and align promotional strategies accordingly.
- Monitor profitability through sales margins
  - Measure margin growth over time to assess efficiency and ensure that revenue growth is aligned with profitability goals.
- Provide an interactive decision-support tool
  - Develop a Power BI dashboard that allows stakeholders to explore KPIs dynamically, drill down into details, and filter data based on specific requirements (e.g., by store, category, or product).

Expected Outcomes and Deliverables

- Comprehensive Power BI Dashboard showcasing sales KPIs, location-based sales, product/category breakdowns, and time-series trends.
- Actionable insights into sales distribution, store-level performance, and customer demand patterns.
- dentification of key revenue drivers (top stores, top products, and profitable categories).
- Strategic recommendations for optimizing store operations, expanding high-demand categories, and stabilizing weekly sales trends.
- A project report documenting methodology, findings, and recommendations for stakeholders.

1. Methods / Technology Used

The project employed a descriptive analytics approach to analyze coffee sales data and uncover actionable insights. The process involved:

- Data Preparation – Importing the raw dataset, verifying data structure, and applying necessary transformations in Power BI.

- Data Modeling – Building relationships between fact and dimension tables (e.g., sales, products, stores, dates) to enable flexible slicing and filtering.

- Visualization – Designing intuitive dashboards using charts, KPIs, and tree maps to present trends and patterns.

- Analysis & Interpretation – Exploring sales behaviour across stores, products, and time to extract insights for decision-making.

2. Tools / Software Used

- **Power BI** – The primary visualization tool for building interactive dashboards and generating insights.

- **Kaggle** – Open-source platform from which the raw dataset was sourced.

3. Data Collection Approach

- The dataset was sourced from **Kaggle**, containing website usage metrics such as page views, sessions, bounce rates, session durations, and conversions.

- Raw data underwent a **quality check** to detect and address inconsistencies, missing values, and duplicate records.

- The cleaned dataset was imported into Power BI for dashboard creation and further analysis.

4. Project Architecture

The project followed a four-layer architecture:

1. Data Source – Sales dataset downloaded from Kaggle.

2. Data Import & Preparation – Dataset imported into Power BI, where transformations (renaming fields, handling nulls, formatting dates) were applied.

3. Data Modeling – Relationships created among fact tables (sales data) and dimension tables (stores, products, dates). DAX formulas were used to calculate measures such as monthly averages and sales margins.

4. Dashboard Creation – Interactive dashboards designed in Power BI to visualize KPIs, store performance, product analysis, and time-based trends.

5. Results and Dashboard Insights

Figure 1: Coffee Shop Sales Analysis
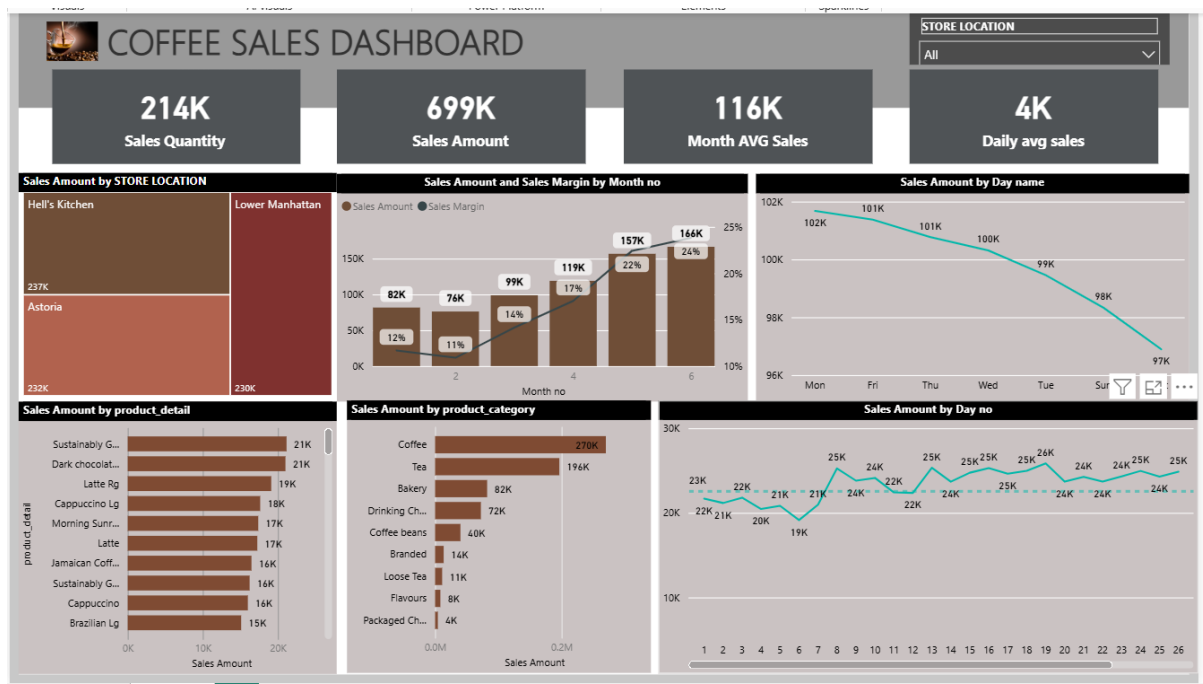
During this project, several important technical and professional learnings were achieved:

- **Technical Skills**

  - Gained hands-on expertise in **Power BI**, particularly in data modeling, using DAX formulas, and designing interactive dashboards.

  - Learned to structure and transform raw datasets for business intelligence reporting, including handling categorical data such as store locations and product categories.

  - Enhanced skills in creating **visual storytelling dashboards**, connecting KPIs, charts, and filters into a cohesive narrative for stakeholders.

  - Understood how to use business intelligence tools to monitor performance trends across **time, geography, and product dimensions**.

- **Analytical & Problem-Solving Skills**

  - Improved ability to extract insights from sales data and translate them into **business-relevant findings**.

  - Identified patterns such as **peak sales days**, **best-performing stores**, and **profit margin growth**.

  - Strengthened the capability to connect observed data patterns with **recommendations for operational improvements**.

- **Soft & Management Skills**

  - Developed **data presentation skills**, learning how to communicate technical results in a concise and executive-friendly way.

  - Improved **time management** by completing the project within the assigned timeline.

  - Built confidence in delivering **business insights using visualization tools**, preparing for professional applications in real-world analytics.

Conclusion and Future Scope

The primary objective of this project was to analyze sales data from multiple coffee shop locations and transform it into actionable insights through an interactive Power BI dashboard. The project successfully achieved the following outcomes:

- Designed a comprehensive dashboard that visualized total sales, sales quantity, average monthly and daily sales, and sales margins.

- Identified top-performing store locations, with Hell's Kitchen, Astoria, and Lower Manhattan contributing the largest share of sales revenue.

- Highlighted product-level insights, revealing coffee and tea as the leading categories and specialty drinks such as Sustainably Grown Coffee and Dark Chocolate Latte as top-selling items.

- Analyzed time-based sales patterns, showing steady month-over-month growth and margins improving from 12% to 24%.

- Provided weekly and daily trends, identifying Mondays as the peak sales day and specific dates with the highest transaction volumes.

Through these findings, the project demonstrated the value of business intelligence tools in turning raw data into actionable insights, enabling managers to evaluate store performance, refine product offerings, and optimize sales strategies.

Future Scope of the Project

While the Coffee Sales Dashboard successfully provided descriptive insights, there are several opportunities to extend and improve the analysis:

- Integration of Real-Time Data – Linking live sales systems to Power BI dashboards for continuous, real-time monitoring.

- Customer Segmentation – Including demographic, loyalty, or purchasing behavior data to better understand customer preferences.

- Predictive Analytics – Applying forecasting models to predict sales demand, identify future top-performing products, and plan inventory.

- Cross-Channel Analysis – Extending dashboards to analyze sales across online orders, mobile apps, and delivery platforms.

- Profitability and Cost Analysis – Incorporating cost data to evaluate margins more deeply, focusing on product profitability and cost optimization.

- Automated Reporting – Enabling scheduled dashboard refresh and automated distribution of insights to stakeholders.