

Data Analysis Project

Report On

“Banking Transactions Analysis”

Abstract

The banking sector generates a vast amount of transactional data through various customer interactions such as deposits, withdrawals, online transfers, and card payments. Analyzing this data effectively is essential for understanding customer behavior, monitoring operational performance, and supporting strategic decision-making. However, raw banking data is often complex and difficult to interpret without proper analytical techniques and visualization tools.

This project focuses on analyzing banking transaction data using a combination of Excel, SQL, and Power BI. Exploratory Data Analysis (EDA) is performed in Excel to clean, organize, and understand the data. SQL is used to extract meaningful insights by applying joins, subqueries and window functions for efficient data analysis. Power BI is utilized to develop an interactive dashboard that visually represents key performance indicators, transaction trends, customer segmentation, and channel-wise performance.

Introduction

In today's digital era, the banking industry generates a massive volume of data from daily financial transactions such as deposits, withdrawals, online transfers, and card payments. With the rapid growth of digital banking channels, the complexity and scale of transactional data have increased significantly. Effectively analyzing this data is crucial for banks to understand customer behavior, improve operational efficiency, reduce risks, and make informed business decisions.

Despite the availability of large datasets, many banks struggle to convert raw transactional data into meaningful insights due to fragmented data sources and the lack of integrated analytical systems. Traditional reporting methods are often time-consuming and fail to provide real-time or interactive insights required by decision-makers. This creates a need for modern data analytics solutions that combine data processing, querying, and visualization.

This project addresses these challenges by integrating Excel for Exploratory Data Analysis (EDA), SQL for structured data querying and analysis, and Power BI for interactive visualization and reporting. Excel is used to clean and explore the dataset, identify trends, and handle data quality issues. SQL enables efficient data extraction using advanced concepts such as joins, subqueries and window functions. Power BI transforms the analyzed data into dynamic dashboards that present key performance indicators, transaction trends, customer segmentation, and channel-wise analysis.

By providing a centralized and interactive analytics solution, this project helps banking stakeholders gain deeper insights into transaction patterns, customer engagement, and operational performance. The outcome of this project demonstrates how data analytics tools can be effectively used to support data-driven decision-making in the banking domain.

Problem Statement

Banks generate large volumes of transaction data through deposits, withdrawals, online transfers, and card payments across multiple customer segments. However, this data often remains underutilized due to the lack of integrated analysis and visualization.

The absence of a centralized analytical system makes it difficult for banks to monitor transaction trends, understand customer behavior, identify high-value customers, and detect operational inefficiencies such as failed transactions.

This project aims to perform exploratory data analysis using Excel, extract meaningful insights using SQL, and build an interactive Power BI dashboard to support data-driven decision-making in the banking domain.

Methodology

- Collect banking-related customer, transaction, and loan data was collected in CSV format representing real-world banking operations.
- Excel was used to handle missing values, remove duplicates, standardize formats, and create derived columns for analysis.
- Pivot tables and charts in Excel were used to identify transaction trends, customer behavior, and channel-wise patterns.
- Cleaned data was imported into a relational database, and tables were created with appropriate relationships and constraints.
- SQL queries involving joins, subqueries, CTEs, and window functions were used to extract insights and perform advanced analysis.

- Relationships between tables were defined and calculated measures were created to support analytical reporting.
- Interactive dashboards were built to visualize KPIs, transaction trends, customer segmentation, and channel performance.
- Dashboard outputs were analyzed to derive actionable insights for improving banking operations and customer experience.

Visual Insight

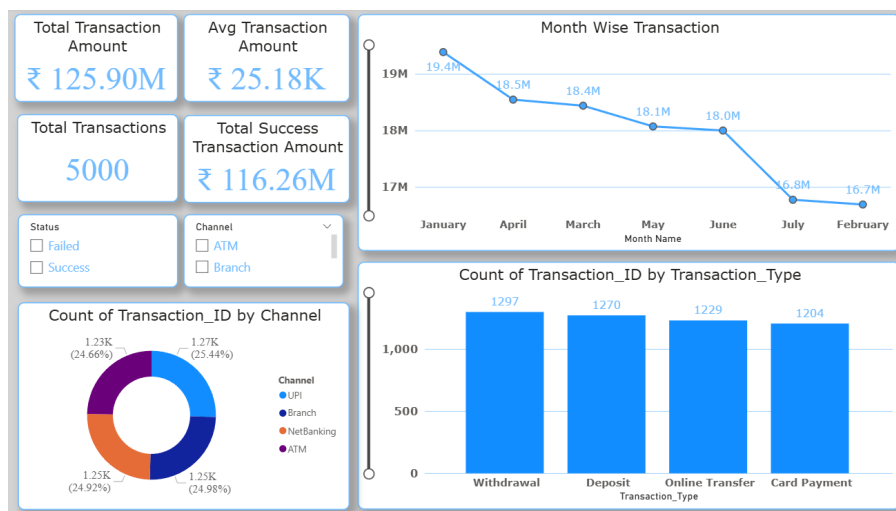


Figure 1: Transaction View

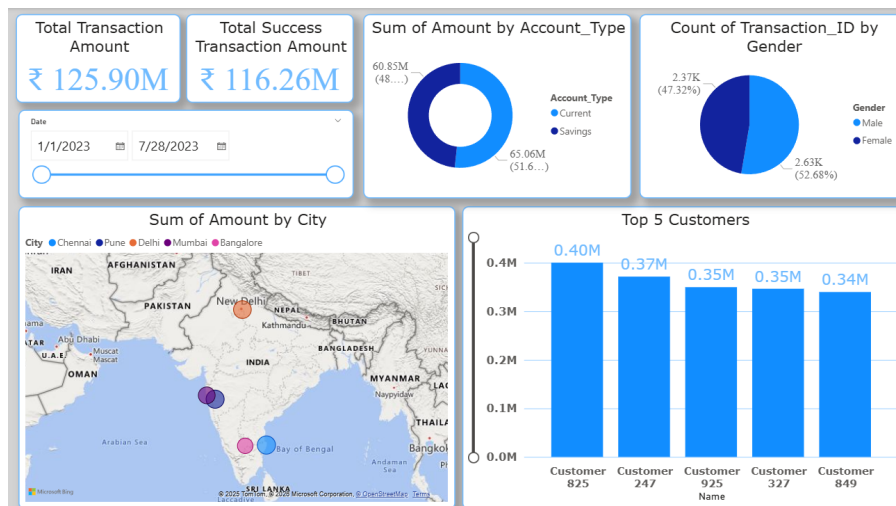


Figure 2: Customer View

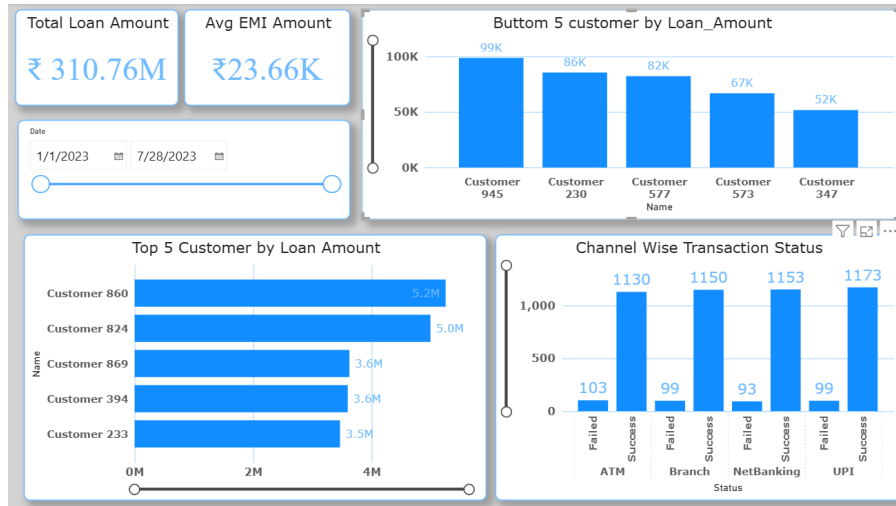


Figure 3: Loan Status Analysis

Key Insight

- Total Success Transaction Amount is ~116.26M.
- ATM is Most used channel contributing over 25.47% all transactions.
- Withdrawal is highest transaction type by count.
- Male in Adult and Female in Senior Perform Most Transaction Amount.
- Most Transactions are occurred in Chennai.
- Failed transactions are highest in ATM channel (due to network issues).
- The bank saw around 49% is digital transactions.
- Online transfers show a consistent growth trend.
- 310.76M is Total loan amount and 23.66K is Avg EMI Amount.
- Customer 860 & Customer 347 is most and least Loan paying Customers respectively.

Conclusion

This project successfully demonstrates how banking transaction data can be analyzed using Excel for EDA, SQL for data analysis, and Power BI for visualization. The interactive dashboard provides valuable insights into customer behavior, transaction trends, and channel performance. The results support data-driven decision-making and help improve operational efficiency in the banking domain.