Data Analysis Project

Report On

"Banking Transactions Analysis"

Abstraction:

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.

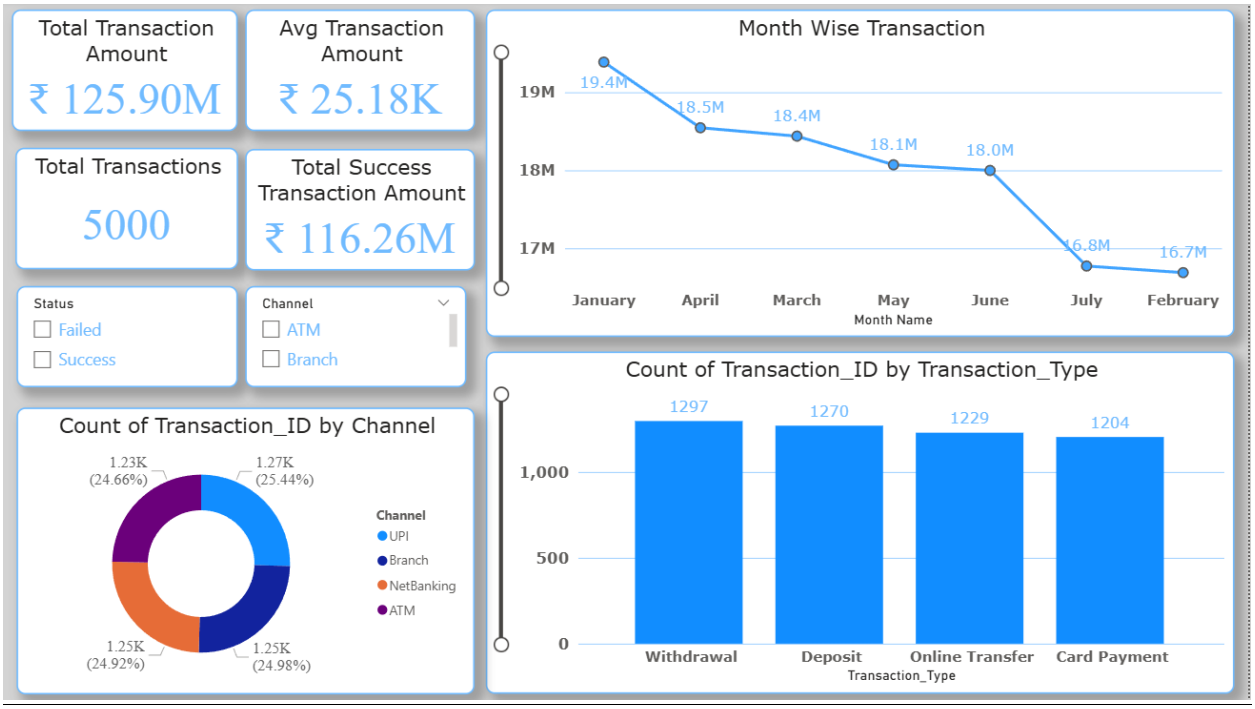
The absence of a centralized analytical system makes it difficult for banks to monitor transaction trends, understand customer behavior, identify high-value customers, and detect operational inefficiencies such as failed transactions.

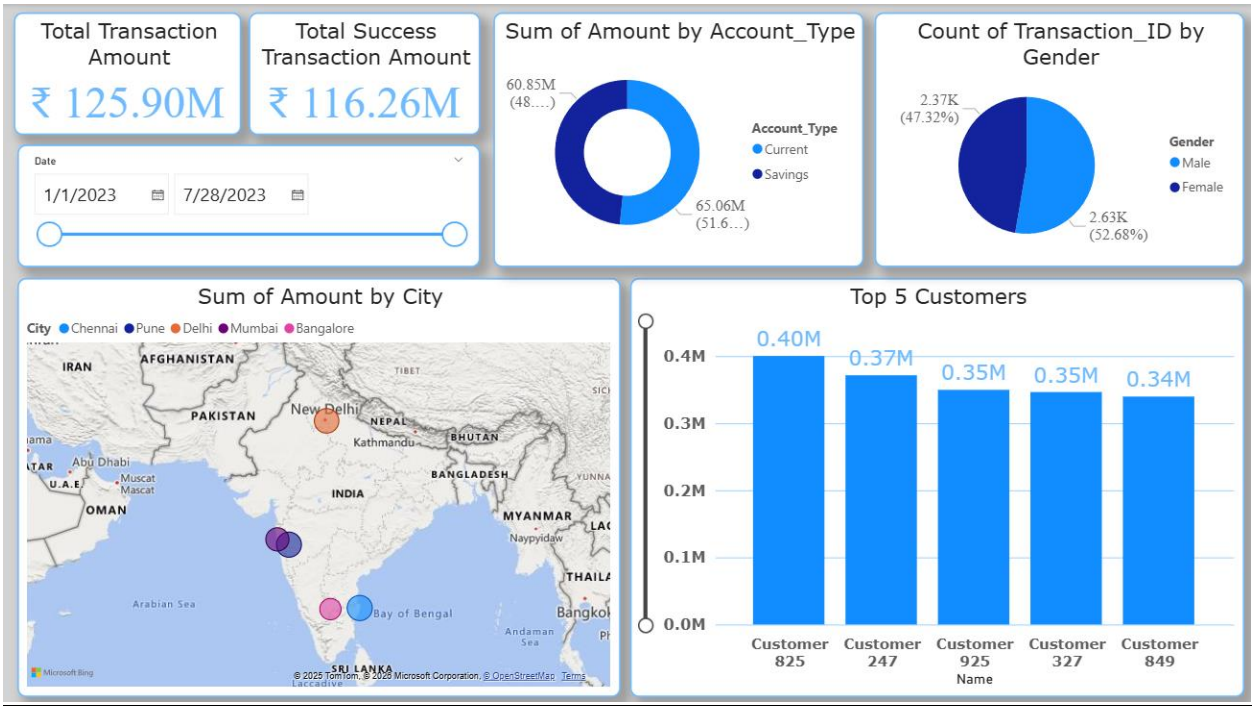
This project aims to perform exploratory data analysis using Excel, extract meaningful insights using SQL, and build an interactive Power BI dashboard to support data-driven decision-making in the banking domain.

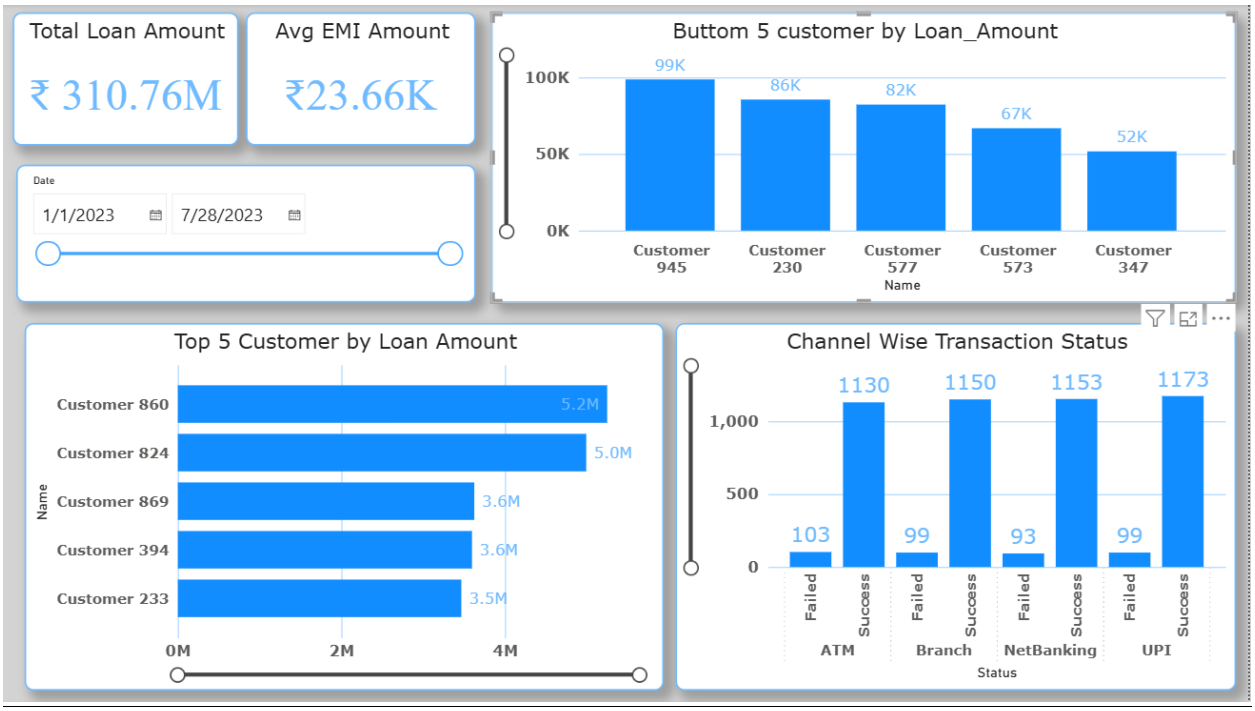
Methodology:

- 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:




Total Transaction Amount
₹ 125.90M
Total Success Transaction Amount
₹ 116.26M
Date
1/1/2023
7/28/2023
Sum of Amount by Account_Type
60.85M (48....)
65.06M (51.6...)
Account_Type
Current
Savings
Count of Transaction_ID by Gender
2.37K (47.32%)
2.63K (52.68%)
Gender
Male
Female
Sum of Amount by City
City Chennai Pune Delhi Mumbai Bangalore
IRAN
AFGHANISTAN
PAKISTAN
New Delhi
NEPAL
Kathmandu
BHUTAN
BANGLADESH
INDIA
MYANMAR
Naypyidaw
Abu Dhabi
Muscat
Mascat
OMAN
Arabian Sea
Bay of Bengal
Andaman Sea
SRI LANKA
Top 5 Customers
0.40M
0.37M
0.35M
0.35M
0.34M
0.4M
0.3M
0.2M
0.1M
0.0M
Customer 825
Customer 247
Customer 925
Customer 327
Customer 849
Name


Total Loan Amount
₹ 310.76M
Avg EMI Amount
₹23.66K
Date
1/1/2023
7/28/2023
Buttom 5 customer by Loan_Amount
99K
86K
82K
67K
52K
100K
50K
0K
Customer 945
Customer 230
Customer 577
Customer 573
Customer 347
Name
Top 5 Customer by Loan Amount
Customer 860
Customer 824
Customer 869
Customer 394
Customer 233
5.2M
5.0M
3.6M
3.6M
3.5M
Name
0M
2M
4M
Channel Wise Transaction Status
1,000
500
0
103
1130
99
1150
93
1153
99
1173
Failed
Success
ATM
Branch
NetBanking
UPI
Status

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.