Symbiosis Institute of Technology, Pune

Artificial Intelligence and Machine Learning

M. Tech 2023-25 Batch

ESE Project Dashboard Submission

Title:
Analyzing ATM Transactions for Business Intelligence

Goals/Objective:

This project aims to analyze the ATM transaction data for Wisabi Bank to gain insights into customer behavior and ATM usage and identify opportunities to enhance the bank's services. This data will enable the bank to develop better strategies for targeting customers and increasing customer loyalty.

- Understanding Wisabi Bank's customer demographics and transaction patterns across locations.
- To identify the most popular ATM services offered by Wisabi Bank and their usage trends.
- Analyzing customer needs and transaction patterns to identify potential opportunities for the bank's services.
- Optimizing Wisabi Bank's operations by finding areas of improvement.

Scope:

This project will focus on analyzing ATM transactions for Wisabi Bank from January 1st, 2022 to December 31st, 2022. The analysis will be conducted at the location level and cover all the bank branches in Lagos, Kano, Rivers State, Enugu, Rivers, and FCT Abuja.

Prepared Dashboard:

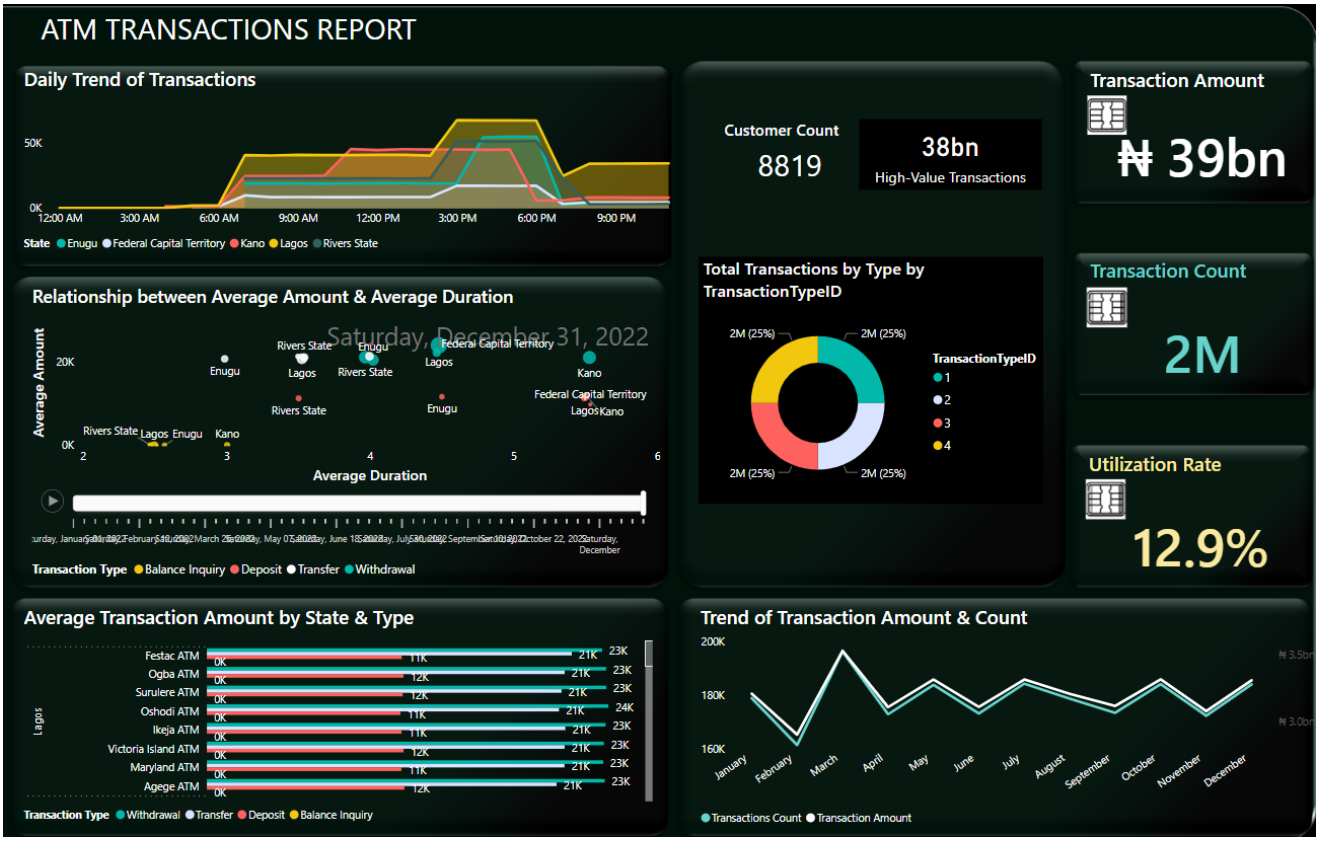

Figure 1: Overview Dashboard

The figure 1 'overview dashboard' with various charts serves as a powerful tool for gaining quick insights, monitoring key metrics, and making informed decisions. The dashboard provides a comprehensive and holistic view of the data by consolidating information from different tables and dimensions. Users can quickly understand the overall state of transactions, customer demographics, and other key metrics.

1. Area Chart:

   The area chart displays the daily trend of transactions. It is a useful visualization for understanding the distribution of transaction counts over hours across different states. We can compare transaction counts across different states by incorporating the' state' dimension. Unusual spikes or dips in the area chart could indicate anomalies or events that impact transaction activity. Investigating these anomalies can provide insights into external factors affecting the business.

2. Scatter Chart:

   The scatter chart, along with the slider to change dates, provides a dynamic and interactive way to analyze the relationship between various factors in the dataset. The bubble size or color can be used to represent the duration of transactions. Larger bubbles or a specific color might indicate longer transaction durations. With this, Group customers based on their transaction frequency and average transaction amount.
3. Clustered Bar Chart:

   A clustered bar chart with the fields avg_transaction_amt, location_name, state, and transaction_type_name can be used to visually represent and compare the average transaction amounts across different locations, states, and transaction types. It provides a breakdown of average transaction amounts for different transaction types within each location and state. This can help in understanding which transaction types contribute more to the overall average.
4. Card:

   There are 5 cards displayed that display a single, aggregated value or measure clearly and concisely. It is a simple and effective way to showcase key performance indicators (KPIs) or summary metrics:

   a. Customer Count

      This card displays the total number of customers in the dataset. It provides a quick snapshot of the size of your customer base.

   b. High-Value Transactions

      With this, a count or sum of transactions that are considered "high-value is shown." We define what constitutes a high-value transaction based on a certain threshold. This card helps you track and monitor the number or total amount of significant transactions.

   c. Transaction Amount

      This card shows the total sum of transaction amounts across all transactions. It provides an overview of the overall financial activity.

   d. Transaction Count

      Here, the total count of transactions is displayed. It gives a quick overview of the volume of transactions, which can be valuable for assessing transaction frequency.

   e. Utilization Rate

      The utilization rate card could represent a metric that measures the efficiency or utilization of a resource or service. It is calculated as the ratio of the total transaction amount to a certain benchmark or capacity.
5. Donut Chart:

   The donut chart of Total Transactions by Type, with TransactionTypeID as the category, can provide valuable insights into the distribution of transactions across different transaction types. By observing the size of each segment in the donut chart,

we can identify the most popular transaction types. This information is valuable for understanding customer behavior and preferences.

6. Line Chart:
   The line chart of transaction count over time is a powerful tool for uncovering patterns and trends in the data. The month-wise view can show broader trends and seasonal variations. A rising or falling line indicates the overall trend in transaction activity. It enables you to make data-driven decisions, optimize operations, and better understand customer behavior.

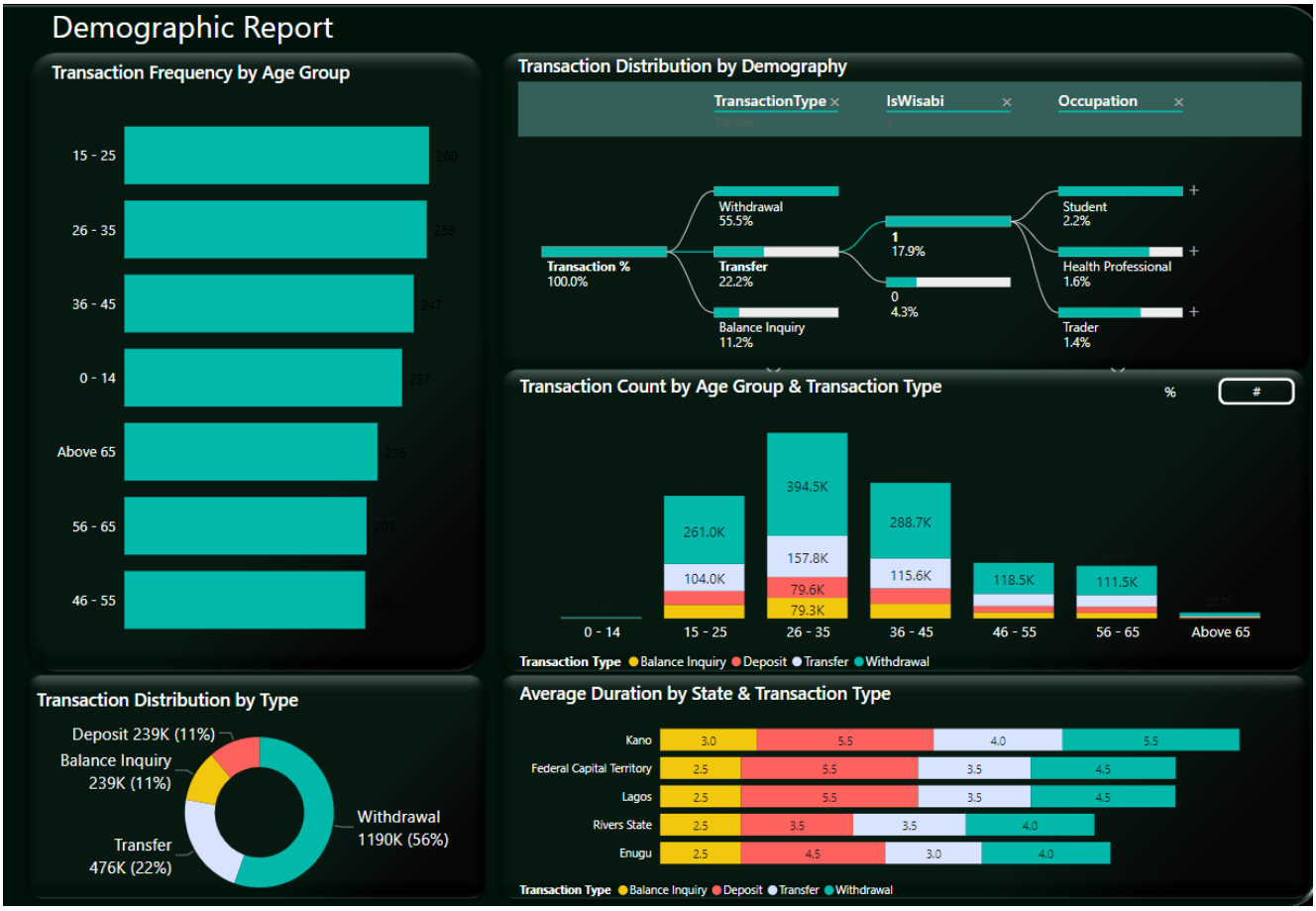

Figure 2: Demography Dashboard

Figure 2 is a visual representation of demographic data, providing a comprehensive and interactive overview of the characteristics of a population. The purpose of a demography dashboard is to analyze and understand the demographic profile of a particular group, community, or target audience.

1. Stacked Bar Chart:
    a. Transaction Frequency by Age Group:
    This chart identifies patterns in transaction behavior across various age groups. It provides a visual representation of how well the business is performing in terms of customer engagement and transaction volume across different age segments.
    b. Average Duration by State and Transaction Type:
    This chart is a representation of the average duration of transactions categorized by both state and transaction type. The chart is structured as a series of horizontal bars, each representing a unique state. Within each bar, different segments are stacked on top of one another, each corresponding to a specific

transaction type.

2. Donut Chart:
   This is a visual representation of the distribution of transactions across different types of charts and allows users to identify which transaction types are more prevalent than others quickly. Larger segments indicate transaction types that contribute significantly to the overall transaction volume.
3. Stacked Column Chart:
   The stacked column chart entitled "Transaction Count by Age Group and Transaction Type" is a visual representation of the distribution of transactions based on two key dimensions: age group and transaction type. A separate column represents each age group, and within each column, different segments represent the count of transactions for various transaction types.
4. Decomposition Tree:
   The "Transaction Distribution by Demography" decomposition tree in Power BI provides a dynamic and interactive way to explore the distribution of transactions based on various demographic factors that include the demography attributes of "Transaction Type," "IsWisabi," and "Occupation." As you navigate the tree, you can drill down into each dimension to uncover patterns, trends, and anomalies in transaction behavior

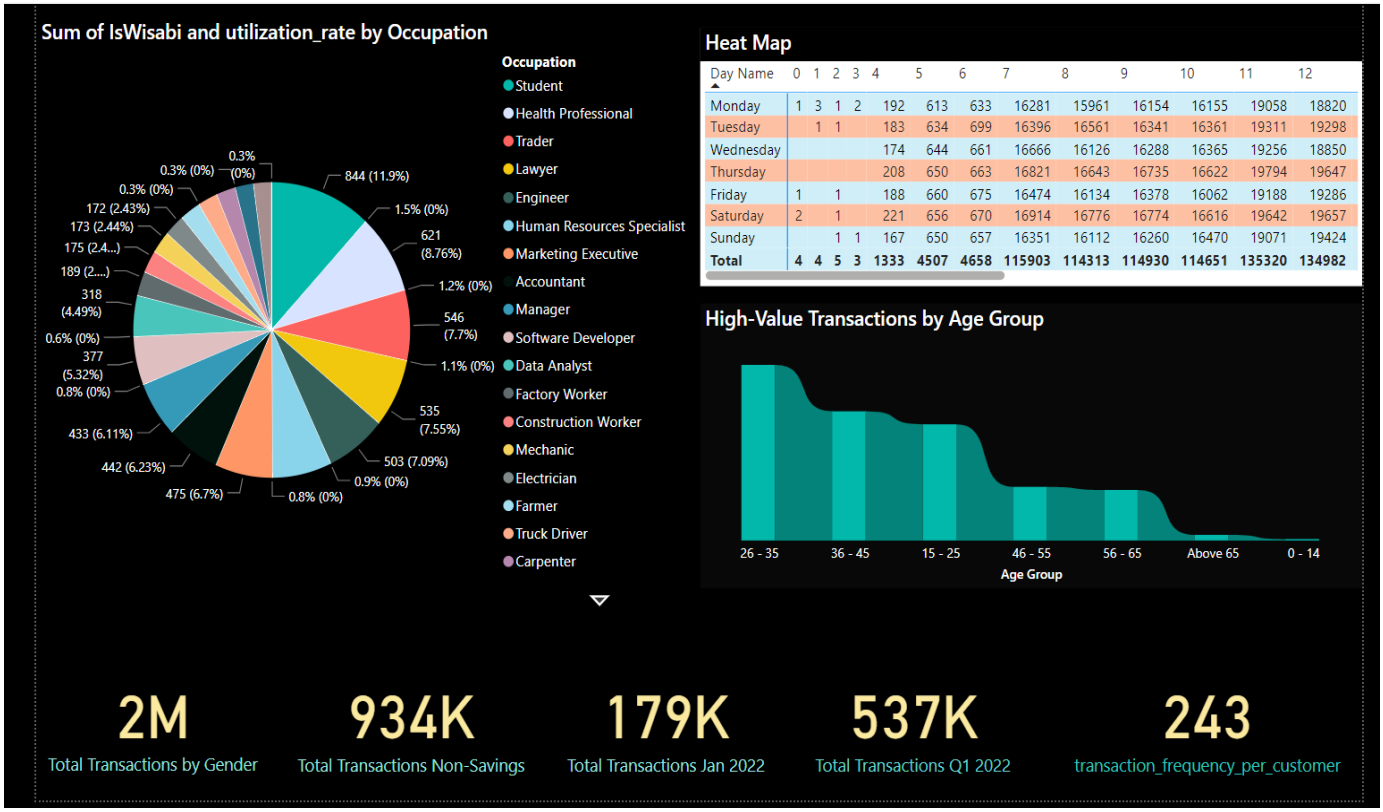

Figure 3: More Dashboard

Figure 3 of More Dashboard is additional information about the cards and an overview of the DAX measures calculated. Below is a description of the various measures used.

1. Pie-Chart:
   The segments of the pie chart represent the total count or sum of cardholders who are customers of Wisabi Bank ("IsWisabi" equals TRUE). Each slice in this part of the chart represents the number of cardholders who are associated with Wisabi Bank. The utilization rate is a metric that measures the engagement or usage of banking services by cardholders. This visual comparison highlights occupations where Wisabi has a significant presence and where banking services are more actively utilized.
2. Heat Map:
   The "Heat Map for Transactions by Hour and Day" in Power BI is a visual representation that provides an at-a-glance view of transaction activity based on the time of day and the day of the week. The heat map uses color intensity to indicate the level of transaction volume, with darker colors representing higher activity.It quickly discerns the busiest hours and days for transactions based on the color intensity.
3. Ribbon Chart:
   The Ribbon Chart for Age Groups and High-value Transactions visualizes the relationship between different age groups and the occurrence of high-value

transactions. Each ribbon represents an age group, and the width of the ribbon corresponds to the count or amount of high-value transactions within that age group. We utilize interactive features to drill down into specific age groups or adjust filters for dynamic and customized analysis.

4. Cards:
    a. Total Transactions by Gender
       Displays the total number of transactions, segmented by gender, and identifies transaction patterns based on gender, helping in targeted marketing or service adjustments.
    b. Total Transactions Non-Savings
       Shows the total number of transactions excluding savings transactions. Highlights the volume of non-savings transactions, aiding in understanding spending behaviors.
    c. Total Transactions Jan 2022
       Presents the total transactions specifically for January 2022 and allows focused analysis of transaction activities for a specific month, aiding in trend identification
    d. Total Transactions Q1 2022
       It illustrates the total transactions for the first quarter of 2022 while providing a broader view of transaction trends over a quarter, aiding in seasonal analysis.
    e. Transaction frequency per customer
       Calculates the average frequency of transactions per customer. Also Offers insights into customer engagement, helping in customer relationship management and service improvement.

In conclusion, the analysis is done with three comprehensive sheets of visualizations incorporating a diverse range of charts, cards, and decomposition trees. With DAX measures, trends, patterns, and key metrics are uncovered. It's a handy tool for straightforward analysis and making smart decisions related to ATM transactions. It facilitates in-depth analysis and strategic decision-making in the realm of ATM transactions. This helps in optimizations for improved business outcomes.