

Symbiosis Institute of Technology, Pune
Artificial Intelligence and Machine Learning
M. Tech 2023-25 Batch
CA2: Dashboard Project Synopsis

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 in order 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.

Dataset:

A. UseCases

Wasabi Bank provides a wide range of financial services to its customers, including savings accounts, current accounts, loans, and investments.

The dataset from this financial institution can be leveraged in the following:

- 1. Business and Market Analysis
Analyzing the dataset would provide insight into the bank's customers' financial behavior and trends. Companies looking to understand consumer spending patterns or explore potential partnerships could benefit from this data.
- 2. Economic Studies
Economists and researchers could use the dataset to study economic trends at a regional or national level by examining the bank's operations and customer financial data.
- 3. Supply Chain Optimization
Companies might use financial data to optimize their supply chain, payment processes, and vendor relationships based on banking transactions.

B. Tables Description

Table Name	Column Name	Description
Transactions Fact Table	TransactionID	Unique identifier for each transaction in the database

	TransactionStartDateTime, TransactionEndDateTime	Datetime when the transaction started and ended
	Cardholder ID	Unique identifier for the cardholder performing the transaction
	Location ID	Unique identifier for the location of the ATM where the transaction occurred
	Transaction Type ID	Unique identifier for the type of transaction that was performed
	Transaction Amount	Amount of money involved in the transaction

	A TransactionID	TransactionStartDateTime	TransactionEndDateTime	A CardholderID	A LocationID	T TransactionTypeID	T TransactionAmount
1	EN-2022-1000000001	01/01/2022 07:01:00	01/01/2022 07:04:00	EN-003-1067	EN-003	4	3000
2	EN-2022-1000000002	01/01/2022 07:02:00	01/01/2022 07:06:00	EN-006-1040	EN-006	1	4000
3	EN-2022-1000000003	01/01/2022 07:02:00	01/01/2022 07:07:00	EN-002-1080	EN-002	1	9000
4	EN-2022-1000000004	01/01/2022 07:06:00	01/01/2022 07:12:00	EN-002-1024	EN-002	1	10000
5	EN-2022-1000000005	01/01/2022 07:06:00	01/01/2022 07:09:00	EN-001-1095	EN-001	4	10000
6	EN-2022-1000000006	01/01/2022 07:07:00	01/01/2022 07:11:00	EN-007-1067	EN-007	2	10000
7	EN-2022-1000000007	01/01/2022 07:10:00	01/01/2022 07:14:00	EN-005-1076	EN-005	3	0
8	EN-2022-1000000008	01/01/2022 07:11:00	01/01/2022 07:13:00	EN-009-1033	EN-009	1	20000
9	EN-2022-1000000009	01/01/2022 07:14:00	01/01/2022 07:16:00	EN-001-1102	EN-001	1	9000
10	EN-2022-1000000010	01/01/2022 07:15:00	01/01/2022 07:18:00	EN-004-1012	EN-004	4	20000
11	EN-2022-1000000011	01/01/2022 07:15:00	01/01/2022 07:20:00	EN-003-1011	EN-003	1	20000
12	EN-2022-1000000012	01/01/2022 07:18:00	01/01/2022 07:21:00	EN-006-1034	EN-006	4	7000
13	FN-2022-1000000013	01/01/2022 07:21:00	01/01/2022 07:23:00	FN-001-1093	FN-001	1	10000

Location Dimension Table	Location ID	Unique identifier for the ATM location
	Location name	Name of the bank branch where the ATM is located

	No of ATMs	Number of ATMs
	City	City in which the ATM is located
	State	State in which the ATM is located
	Country	Country in which the ATM is located




	^A _C LocationID	^A _C Location Name	¹ ₃ No of ATMs	^A _C City	^A _C State	^A _C Country
1	LA-001	Wisabi Bank HQ		7 Lagos	Lagos	Nigeria
2	LA-002	Victoria Island ATM		3 Lagos	Lagos	Nigeria
3	LA-003	Ikeja ATM		3 Lagos	Lagos	Nigeria
4	LA-004	Lekki ATM		3 Lagos	Lagos	Nigeria
5	LA-005	Surulere ATM		3 Lagos	Lagos	Nigeria
6	LA-006	Festac ATM		3 Lagos	Lagos	Nigeria
7	LA-007	Apapa ATM		3 Lagos	Lagos	Nigeria

Customer Dimension Table	Name	Name of the cardholder
	Gender	Gender of the cardholder
	ATM ID	Unique identifier for the ATM
	Age	Age of the cardholder
	Occupation	Occupation of the cardholder
	Account Type	Type of account that the cardholder has (e.g., savings,







		checking, etc.)
	Is Wisabi	Boolean flag that indicates whether the cardholder is a customer of Wisabi Bank or another bank

	lame	A ^B _C Gender	A ^B _C ATMID	A ^B _C Birth Date	A ^B _C Occupation	A ^B _C AccountType	I ² ₃ IsWisabi
1		M	RI-004	02/14/2002	Mechanic	Current	1
2		M	FC-005	06/28/1987	Factory Worker	Current	0
3		F	FC-005	09/28/2003	Trader	Current	1
4		M	FC-006	08/20/1978	Human Resources Specialist	Current	1
5		F	FC-006	10/2/1985	Trader	Current	1

Transaction Type Dimension Table	TransactionTypeID	Unique identifier for the transaction type (e.g., 1 for withdrawal, 2 for savings, 3 for balance enquiry, 4 for transfer)
	TransactionType	Name of the transaction type (e.g., "withdrawal", "savings", "balance enquiry", "transfer")

	 1 ² ₃ TransactionTypeID		A ^B _C TransactionTypeName	
1		1	Withdrawal	
2		2	Deposit	
3		3	Balance Inquiry	
4		4	Transfer	

Hour Dimension Table	Hours	Hour of the day (0-23)
	Hour Start Time / End Time	Time at which the hour begins or ends

	 1 ² ₃ Hour_Key		 Hour_Start_Time		 Hour_End_Time	
1		0	00:00:00		00:59:59	
2		1	01:00:00		01:59:59	
3		2	02:00:00		02:59:59	
4		3	03:00:00		03:59:59	
5		4	04:00:00		04:59:59	
6		5	05:00:00		05:59:59	
7		6	06:00:00		06:59:59	
8		7	07:00:00		07:59:59	
9		8	08:00:00		08:59:59	

Calendar Dimension Table	Date , Quarter , Month , Day , Year , Week of the Year	—
	Is Holiday	Boolean flag that indicates

		whether the date is a public holiday
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A _C Month Name	1 ₃ Month	A _C Quarter	1 ₃ Week of Year	A _C End of Week	1 ₃ Day of Week	A _C Day Name	1 ₃ IsHoliday
January		1 Q1		1 1/1/2022	5	Saturday	
January		1 Q1		1 1/8/2022	6	Sunday	
January		1 Q1		2 1/8/2022	0	Monday	
January		1 Q1		2 1/8/2022	1	Tuesday	
January		1 Q1		2 1/8/2022	2	Wednesday	
January		1 Q1		2 1/8/2022	3	Thursday	
January		1 Q1		2 1/8/2022	4	Friday	
January		1 Q1		2 1/8/2022	5	Saturday	
January		1 Q1		2 1/15/2022	6	Sunday	

C. Types of Files

The transaction data are the CSV files for the headquarters located in Lagos with branches in Kano, Rivers State, Enugu, and FCT Abuja.

Source: https://github.com/Wasibi_Bank_ATM_Transaction

Preprocessing:

1. Remove Columns:

Identifying and removing columns from the dataset that are not relevant to the analysis or contain redundant information.

2. Rename Columns:

Provides more meaningful and user-friendly names to the columns and helps improve the dataset's readability and clarity.

3. Add Custom Columns:

With calculations, aggregations, or transformations on existing data, custom columns can be added to the dataset to derive new insights.

4. Change Data Type:

Data types of specific columns are modified to ensure they match the intended use. These preprocessing steps are essential to clean and structure the dataset for further analysis and modeling, making it more suitable for the specific analytical goals and reducing potential errors or inconsistencies in the data.

Measures/KPIs

1. Total Transactions
COUNTROWS function applied to the Transactions Fact Table
2. Total Customers
COUNTROWS function applied to the Customers Dimension Table
3. Total Transaction Types
COUNTROWS function applied to the Transaction Type Dimension Table.
4. Total Withdrawals on Weekends
Calculates the total number of withdrawal transactions that occurred on weekends (Saturday and Sunday)
5. Total Transactions by Holiday
COUNTROWS and SUMMARIZE functions on Is Holiday in the Calendar Dimension Table.
6. Total Transactions per Year
Calculates the total number of transactions in the dataset for each year, disregarding any filters applied to the 'Calendar Dimension Table'.
7. Average Transaction Amount in the Last 30 Days
Calculates the average transaction amount for transactions in the last 30 days using

AVERAGEX and FILTER.

8. Average Transaction Amount By Location Name with Average
Calculates the average transaction amount for each unique location name using the AVERAGE function.
9. Total Savings Transactions
Calculates the total number of savings transactions using the FILTER function to specify the transaction type.
10. Total Transactions on Weekdays
Calculates the total number of transactions that occurred on weekdays (Monday to Friday). It uses the WEEKDAY function to filter the days of the week.
11. Total Transactions by Gender
Calculates the total number of transactions for male and female customers using COUNTAX along with FILTER
12. Total Transactions in the Last 7 Days
Calculates the total number of transactions in the last 7 days using DATEADD to subtract 7 days from the current date.
13. Total Transactions in Q1
Calculates the total number of transactions in the first quarter (Q1) of the year using SUMX and FILTER.
14. Total Transactions on Public Holidays
Calculates the total number of transactions that occurred on public holidays. It filters the 'Calendar Dimension Table' for dates marked as holidays.

15. Total Transactions per Month in the Last Year

The measure calculates the total number of transactions per month in the last year using DATEADD to subtract one year from the current date.

Visuals/Graphs

1. Line Chart - Total Transactions Over Time

Displays the total number of transactions over time, providing insights into transaction trends.

2. Stacked Bar Chart - Total Transactions by Transaction Type and Month

Display the breakdown of transactions by type and month, allowing you to identify monthly trends.

3. Pie Chart - Distribution of Account Types

This chart will show the distribution of account types held by cardholders.

4. Histogram - Distribution of Transaction Amounts

A histogram will help visualize the distribution of transaction amounts.

5. Table - Top 10 Customers with the Most Transactions

A table can display the details of the top 10 customers with the highest transaction counts.

6. Bubble Chart - Transaction Amount vs. Age vs. Gender

A bubble chart can provide insights into the relationship between transaction amounts, age, and gender.

7. Stacked Column Chart - Total Transactions by Occupation and Month

This chart will show the breakdown of transactions by occupation and month, allowing you to identify trends among different occupations.

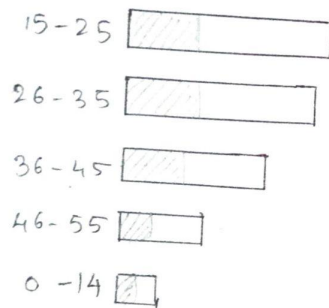
8. Tree Map - Transaction Type Hierarchy

A tree map can represent the hierarchy of transaction types and their proportions within the dataset.

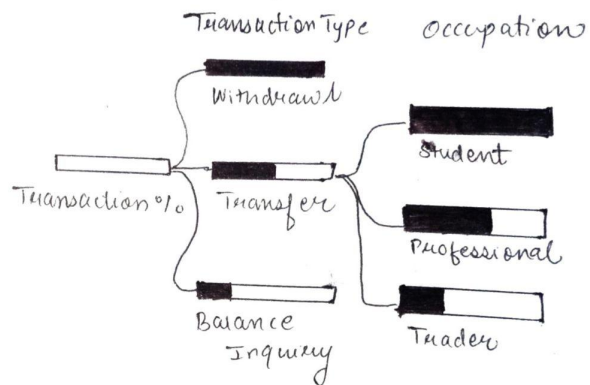
Sketch/rough pictorial plan of the dashboard

Demographic Report

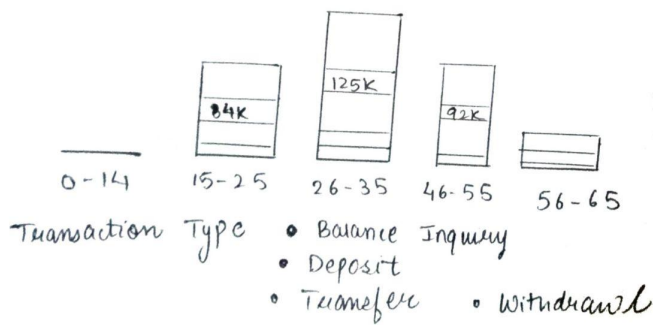
Transaction Frequency of Age Group



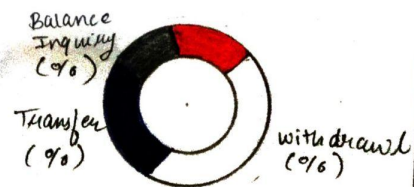
Transaction Distribution by Demography



Transaction Count by Age Group & Transaction Type



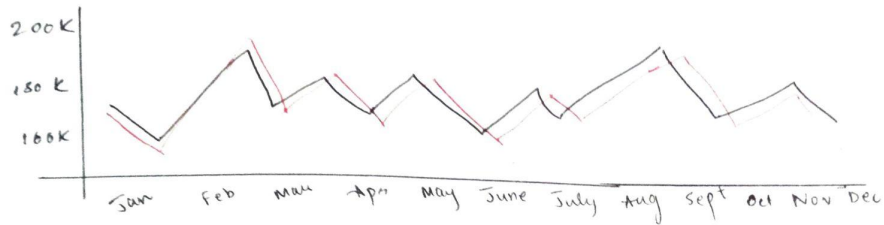
Transaction Distribution by Type





ATM TRANSACTIONS REPORT

Trend of Transaction amount & count.



Average Transaction amount by state & type.

Lagos	
Federal	
Engu	
River state	
Kano	

Transaction amount

Transaction count

Utilization Rate

customer count

References

1. <https://www.keboola.com/blog/power-bi-data-preparation>
2. <https://franchisealpha.com/7-key-performance-indicators-kpis-for-a-successful-atm-or-vending-machine-franchise/#:~:text=For%20ATM%20franchises%2C%20cash%20management,and%20forecasting%20cash%20needs%20accurately.>
3. <https://learn.microsoft.com/en-us/power-bi/visuals/power-bi-visualization-kpi?tabs=powerbi-desktop>
4. <https://www.datatobiz.com/blog/power-bi-for-banking/>
5. <https://learn.microsoft.com/en-us/training/paths/dax-power-bi/>
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7. <https://powerbi.microsoft.com/en-us/power-bi-visuals/>