

WISABI BANK

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Wisabi Bank

Executive Summary:

This dataset provides a comprehensive view of transactions, ATM locations, cardholder details, transaction types, and temporal information for Wisabi Bank. It can be used to analyze ATM transactions and customer behavior to identify patterns, trends, and insights for optimizing banking services and customer experience.

The dataset consists of transactional data captured in the Fact Transaction Table, which includes information such as transaction ID, start and end datetime, cardholder ID, location ID, transaction type ID, and transaction amount.

There are 5 transactional tables that can be unioned to provide a comprehensive view of the bank's ATM operations across all locations.

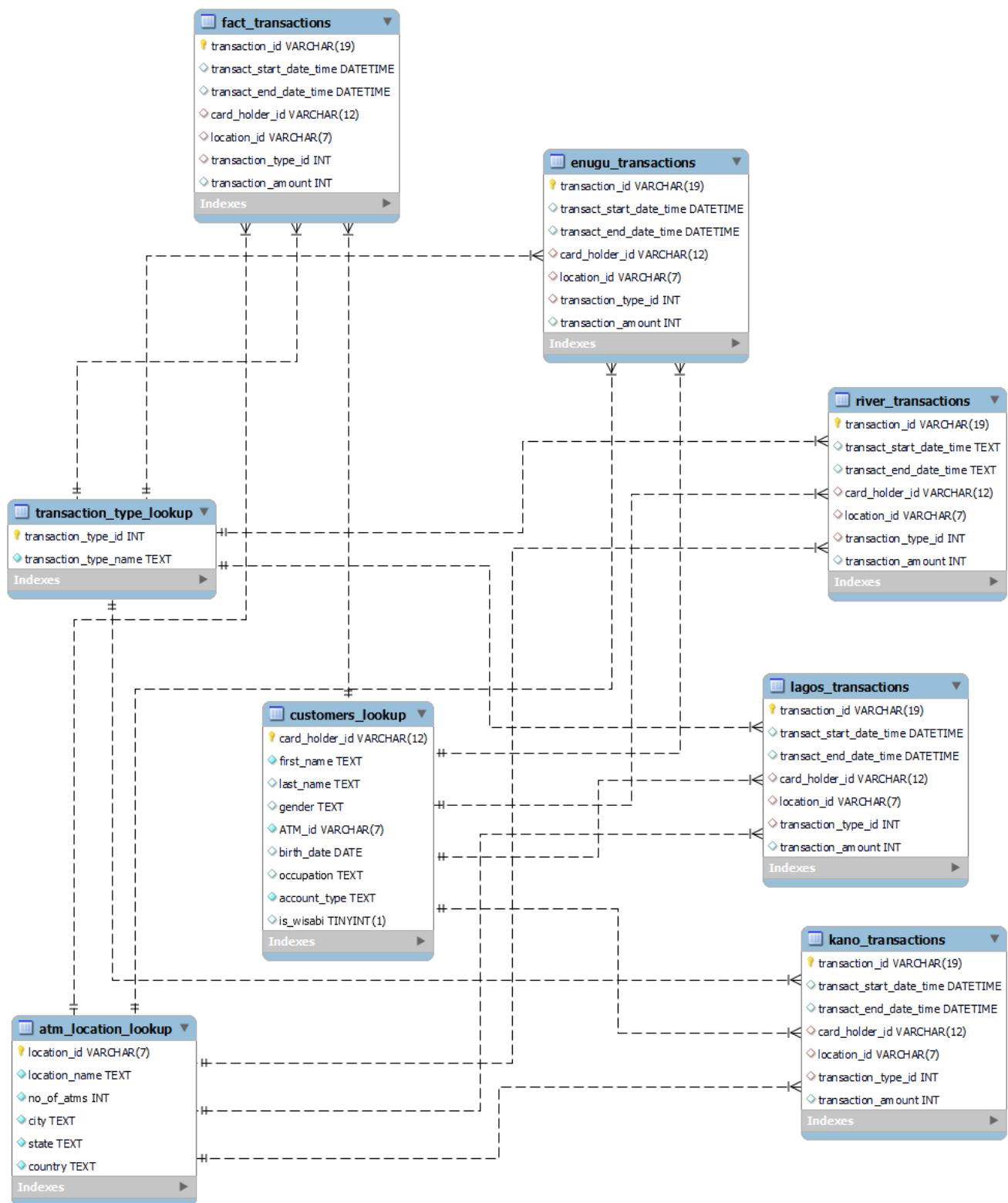
The ATM Location Lookup table provides details about ATM locations, including location ID, location name, number of ATMs, city, state, and country.

The Customer Lookup table contains information about cardholders, such as cardholder ID, first name, last name, gender, ATM ID, age, occupation, account type, and whether they are customers of Wisabi Bank.

The Transaction Type Lookup Table defines different transaction types and their corresponding IDs and names.

The Data Dictionary contains more information on this dataset.

Entity Relationship Diagram:



Data Analysis Process/Approach:

Data Gathering: Gathered the ATM and customer-related data of Wisabi Bank from an online source.

Data Importing: The collected data is imported into the MYSQL Workbench for further analysis.

Processing: The imported data is organized by creating tables and relations between the tables and ensures data integrity. Then some of the field needs to be transformed for the feasible analysis like data and time columns format. The dataset was large so for better performance, a view table with named “combined table” is created to append the data of all five transaction tables in one table to write the optimized query.

Insights: The insights are performed after analysis and build some recommendations according to the insights.

Objective:

Analyze ATM transactions and customer behavior to identify patterns, trends, and insights for optimizing banking services and customer experience.

Queries:

Query 1: What are the most common transaction types, and how do they contribute to overall transaction volume?

```
SELECT tt.transaction_type_id, tt.transaction_type_name, COUNT(*) AS TransactionCount
FROM (
  SELECT transaction_type_id FROM fact_transactions
  UNION ALL
  SELECT transaction_type_id FROM enugu_transactions
  UNION ALL
  SELECT transaction_type_id FROM lagos_transactions
  UNION ALL
  SELECT transaction_type_id FROM kano_transactions
  UNION ALL
  SELECT transaction_type_id FROM river_transactions
) AS CombinedTables
JOIN transaction_type_lookup AS tt
ON CombinedTables.transaction_type_id = tt.transaction_type_id
GROUP BY tt.transaction_type_id, tt.transaction_type_name
ORDER BY TransactionCount DESC;
```

Query 2: What is the relationship between transaction types and transaction amounts, and how can we use this information to improve our service offerings?

```

SELECT transaction_type_id, AVG(combined_tables.transaction_amount) AS avg_transaction_amount
FROM (
    SELECT transaction_type_id, transaction_amount FROM fact_transactions
    UNION ALL
    SELECT transaction_type_id, transaction_amount FROM enugu_transactions
    UNION ALL
    SELECT transaction_type_id, transaction_amount FROM kano_transactions
    UNION ALL
    SELECT transaction_type_id, transaction_amount FROM lagos_transactions
    UNION ALL
    SELECT transaction_type_id, transaction_amount FROM river_transactions
) AS combined_tables
JOIN transaction_type_lookup AS tt
ON combined_tables.transaction_type_id = tt.transaction_type_id
GROUP BY transaction_type_id
ORDER BY transaction_type_id;

```

Query 3: What is the average transaction amount for "withdrawal" transactions, categorized by account type, and how does this amount vary across different ATM locations?

```

SELECT location_name, cl.account_type, AVG(transaction_amount) AS avg_transaction_amount
FROM (
    SELECT location_id, transaction_type_id, card_holder_id, transaction_amount
    FROM fact_transactions
    UNION ALL
    SELECT location_id, transaction_type_id, card_holder_id, transaction_amount
    FROM enugu_transactions
    UNION ALL
    SELECT location_id, transaction_type_id, card_holder_id, transaction_amount
    FROM lagos_transactions
    UNION ALL
    SELECT location_id, transaction_type_id, card_holder_id, transaction_amount
    FROM kano_transactions
    UNION ALL
    SELECT location_id, transaction_type_id, card_holder_id, transaction_amount
    FROM river_transactions
) AS combined_tables
JOIN atm_location_lookup AS al
ON combined_tables.location_id = al.location_id
JOIN transaction_type_lookup AS tt
ON combined_tables.transaction_type_id = tt.transaction_type_id
JOIN customers_lookup cl

```

```

ON combined_tables.card_holder_id = cl.card_holder_id
WHERE tt.transaction_type_name = 'Withdrawal'
GROUP BY al.location_name, cl.account_type
ORDER BY al.location_name, avg_transaction_amount DESC;

```

Query 4: Is there a correlation between transaction volume and ATM availability in different cities, and how can we optimize ATM deployment for improved service?

```

SELECT city, COUNT(*) AS ATMs, SUM(TransactionCount) AS TotalTransactions
FROM (
  SELECT city, location_name, COUNT(*) AS TransactionCount
  FROM (
    SELECT l.city, l.location_name
    FROM fact_transactions ft
    JOIN atm_location_lookup l ON ft.location_id = l.location_id
    UNION ALL
    SELECT l.city, l.location_name
    FROM enugu_transactions et
    JOIN atm_location_lookup l ON et.location_id = l.location_id
    UNION ALL
    SELECT l.city, l.location_name
    FROM kano_transactions kt
    JOIN atm_location_lookup l ON kt.location_id = l.location_id
    UNION ALL
    SELECT l.city, l.location_name
    FROM lagos_transactions lt
    JOIN atm_location_lookup l ON lt.location_id = l.location_id
    UNION ALL
    SELECT l.city, l.location_name
    FROM river_transactions rt
    JOIN atm_location_lookup l ON rt.location_id = l.location_id
  ) AS location_data
  GROUP BY city, location_name
) AS Subquery
GROUP BY city
ORDER BY ATMs;

```

Query 5: Are there seasonal trends in transaction amounts, and how can we use this information to optimize cash reserves and marketing strategies?

```

SELECT MONTH(transact_start_date_time) AS months, AVG(transaction_amount) AS
avg_transaction_amount
FROM (

```

```

SELECT transact_start_date_time, transaction_amount FROM fact_transactions
UNION ALL
SELECT transact_start_date_time, transaction_amount FROM kano_transactions
UNION ALL
SELECT transact_start_date_time, transaction_amount FROM enugu_transactions
UNION ALL
SELECT transact_start_date_time, transaction_amount FROM lagos_transactions
UNION ALL
SELECT transact_start_date_time, transaction_amount FROM river_transactions
) AS CombinedTables
GROUP BY months
ORDER BY months;

```

Query 6: Monitor transaction volume trends to identify peak months for service optimization.

```

SELECT month(transact_start_date_time) AS months, COUNT(*) AS transaction_count
FROM combined_transactions
GROUP BY months
ORDER BY months, transaction_count DESC;

```

Query 7: What are the most common types of transactions conducted by students, and how do they differ from transactions made by customers in other occupations?

```

SELECT cl.occupation, ct.transaction_type_id, COUNT(*) AS TransactionCount
FROM customers_lookup cl
JOIN combined_transactions ct ON cl.card_holder_id = ct.card_holder_id
WHERE cl.occupation = 'Student' OR cl.occupation <> 'Student'
GROUP BY cl.occupation, ct.transaction_type_id
ORDER BY TransactionCount DESC;

```

Query 8: What is the transaction behavior, in terms of transaction counts, across different occupations for both Wisabi Bank and non-Wisabi Bank customers, and how does it vary among these occupational groups?

```

SELECT
    cl.is_wisabi,
    cl.occupation,
    COUNT(*) AS transaction_count
FROM
    combined_transactions ct
JOIN
    customers_lookup cl
ON ct.card_holder_id = cl.card_holder_id

```



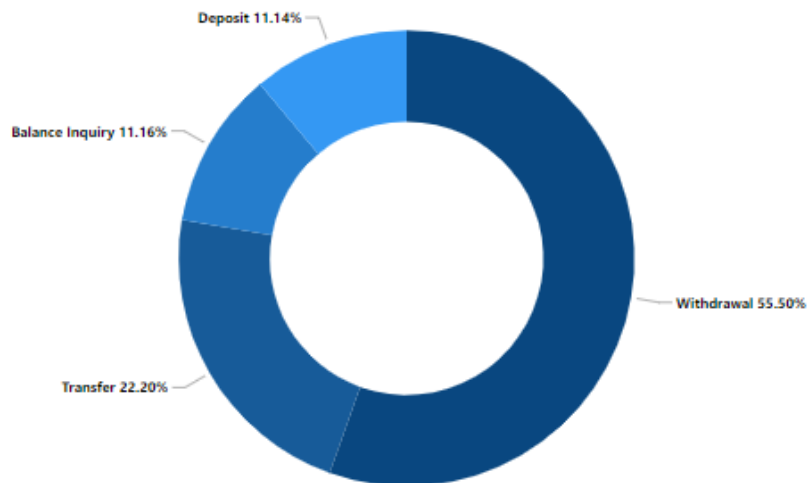
```
GROUP BY
  cl.is_wisabi, cl.occupation
ORDER BY
  cl.occupation DESC;
```

Results, Insights, And Visualization:

Query 1:

transaction_type_id	transaction_type_name	TransactionCount
1	Withdrawal	1189851
4	Transfer	475872
3	Balance Inquiry	239265
2	Deposit	238850

Transaction_Count_by_transaction_type_name

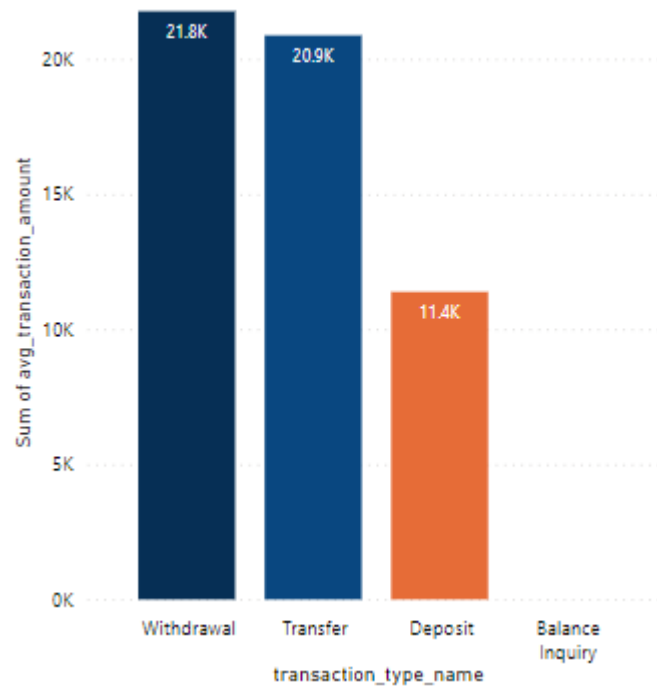


Insights: The analysis of transaction types has revealed that the most common transaction type is "withdrawal," which accounts for a significant portion of overall transactions. These findings indicate that customers primarily use ATMs for accessing cash and checking their account balances.

Query 2:

transaction_type_id	transaction_type_name	avg_transaction_amount
1	Withdrawal	21769.3535
2	Deposit	11385.1078
3	Balance Inquiry	0
4	Transfer	20875.9183

Avg_Transaction_Amount_by_transaction_type_name



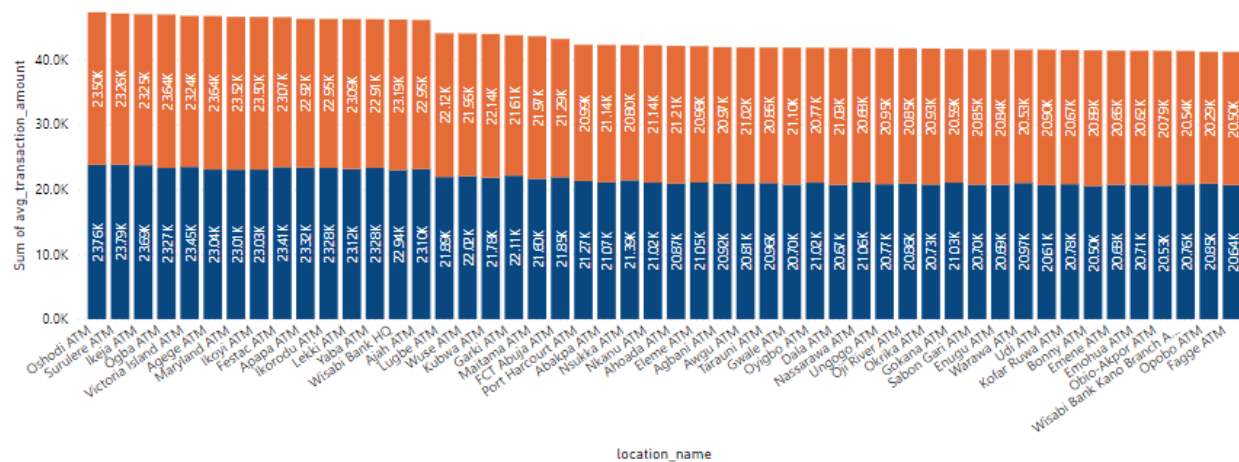
Insights: There is variation in the average transaction amounts for different transaction types, with withdrawals involving larger amounts with a slight difference of transfers, and deposits have fewer amounts.

Query 3:

location_name	account_type	avg_transaction_amount
Abakpa ATM	Savings	21144.6977
Abakpa ATM	Current	21073.2203
Agbani ATM	Savings	20972.1402
Agbani ATM	Current	20915.247
Agege ATM	Savings	23635.6734
Agege ATM	Current	23036.5046
Ahoda ATM	Savings	21207.4185
Ahoda ATM	Current	20865.4603
Ajah ATM	Current	23104.5647
Ajah ATM	Savings	22946.9666
Apapa ATM	Current	23320.8177
Apapa ATM	Savings	22918.3764
Awgu ATM	Savings	21022.1106
Awgu ATM	Current	20813.7597
Bonny ATM	Savings	20885.4051
Bonny ATM	Current	20500.3485
Dala ATM	Savings	21085.9439
Dala ATM	Current	20673.3079
Eleme ATM	Current	21048.5892
Eleme ATM	Savings	20975.6199

Sum of avg_transaction_amount by location_name and account_type

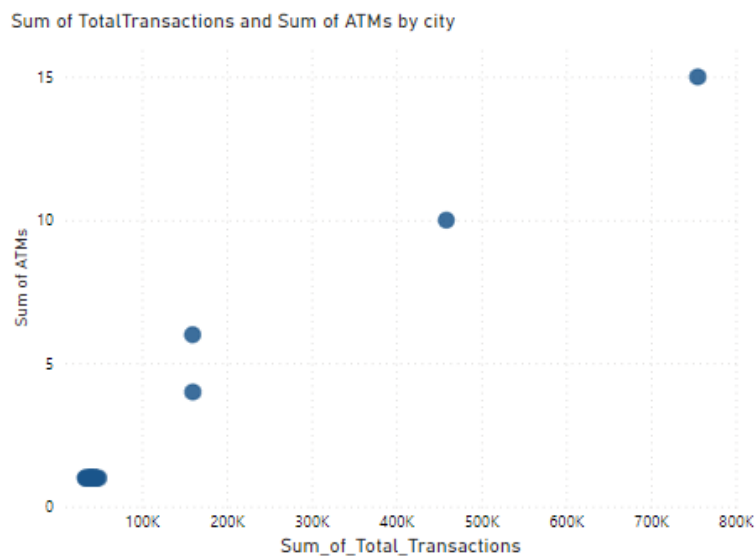
account_type ● Current ● Savings



Insight: The analysis of "withdrawal" transactions reveals that the average transaction amount varies across different ATM locations and is further influenced by the account type of the customers. Customers with current accounts tend to withdraw larger amounts compared to those with saving accounts. This information provides valuable insights into the withdrawal behavior of customers in different areas.

Query 4:

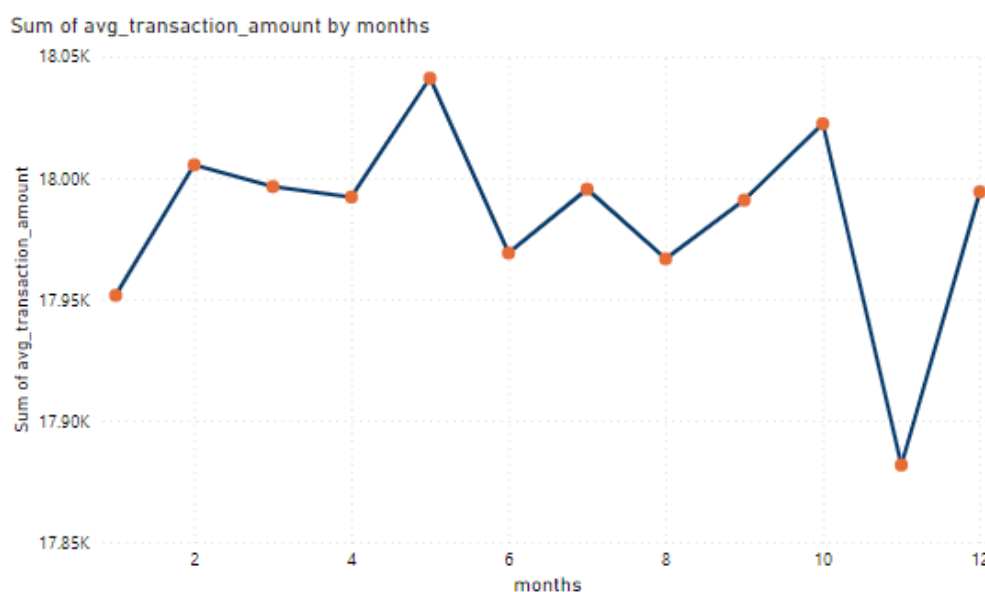
city	ATMs	TotalTransactions
Oji	1	40376
Nsukka	1	33168
Udi	1	43795
Awgu	1	34074
Nkanu	1	38865
Gokana	1	44566
Port Harcourt	1	48954
Ahoada	1	39881
Bonny	1	38035
Emohua	1	43365
Eleme	1	45993
Oyigbo	1	37804
Opobo	1	45552
Okrika	1	40612
Obio-Akpor	1	35336
Enugu	4	159973
Abuja	6	159652
Kano	10	458764
Lagos	15	755073



Insight: Our analysis has revealed significant differences in the number of ATMs across cities. Most cities have just one ATM, while two cities have 10 and 15 ATMs respectively. This variation suggests a mismatch between ATM availability and transaction demand.

Query 5:

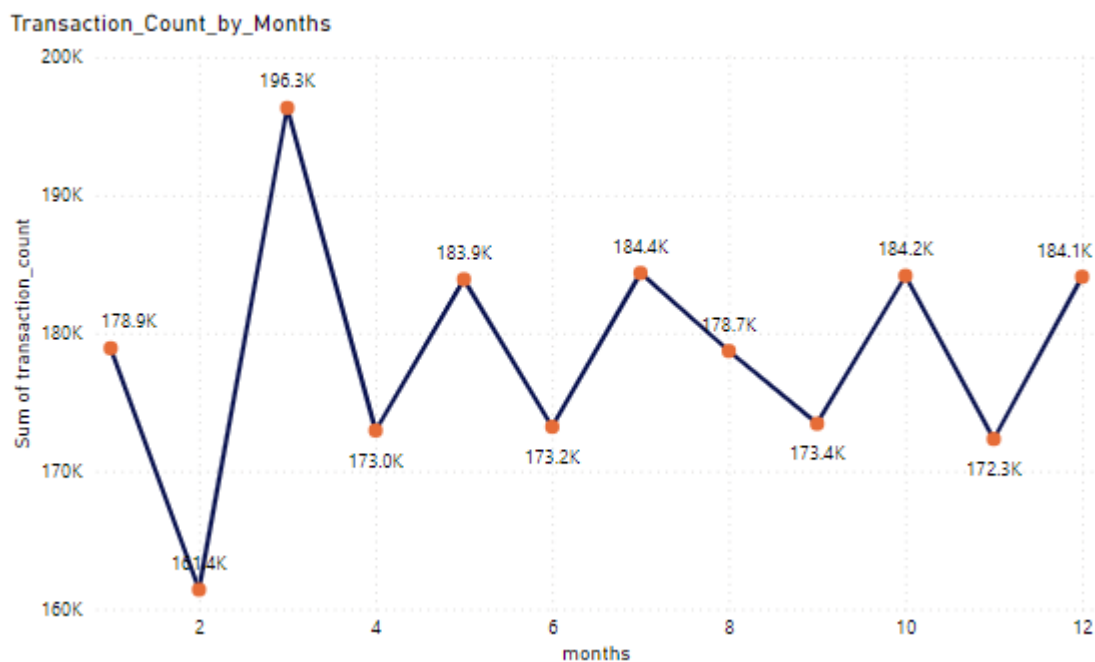
Month_Name	Avg_Transaction_Amount
April	17992.2002
August	17966.7734
December	17994.3451
February	18005.4641
January	17951.7251
July	17995.4546
June	17969.137
March	17996.4956
May	18041.1626
November	17881.8058
October	18022.4094
September	17990.9365



Insights: Our analysis has revealed distinct seasonal patterns in transaction amounts throughout the year. Specifically, we've observed that there are months when transaction averages are notably higher compared to others.

Query 6:

months	transaction_count
1	178913
2	161418
3	196327
4	172953
5	183905
6	173217
7	184362
8	178712
9	173443
10	184164
11	172335
12	184089

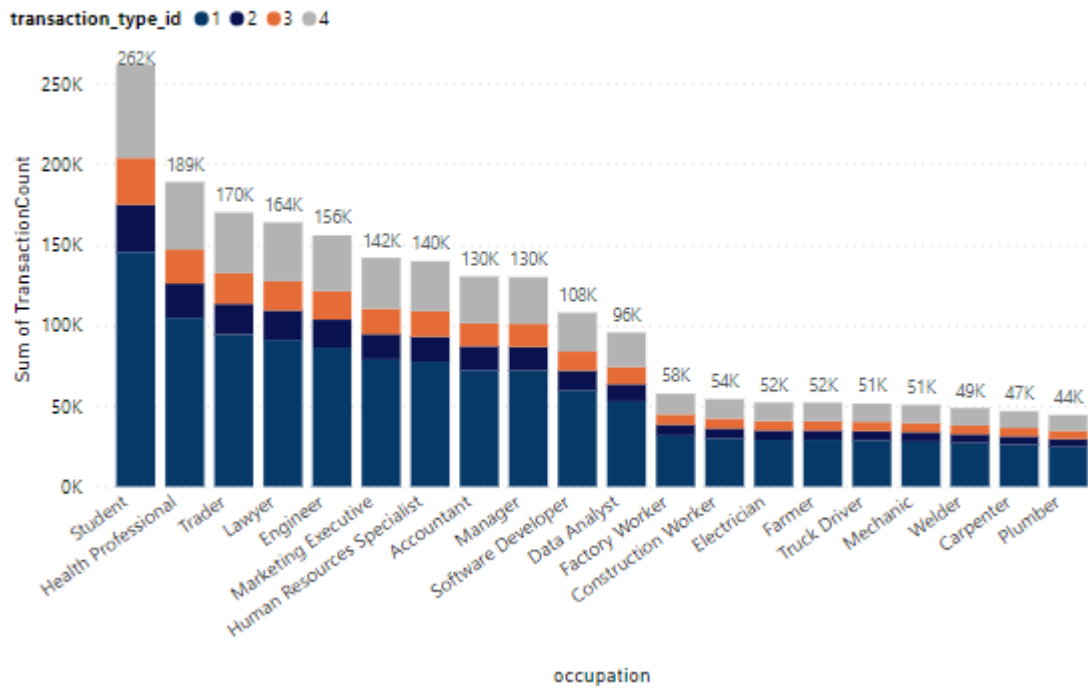


Insights: Variations in transaction volume across months may indicate seasonal trends, economic factors, or changes in customer behavior.

Query 7:

occupation	transaction_type_id	TransactionCount
Student	1	145526
Health Professional	1	104712
Trader	1	94427
Lawyer	1	91072
Engineer	1	86211
Marketing Executive	1	78926
Human Resources Specialist	1	77525
Accountant	1	72250
Manager	1	72129
Software Developer	1	59766
Student	4	57658
Data Analyst	1	52835
Health Professional	4	41934
Trader	4	37638
Lawyer	4	36534
Engineer	4	34663
Factory Worker	1	31774
Marketing Executive	4	31493
Human Resources Specialist	4	31022
Construction Worker	1	30015

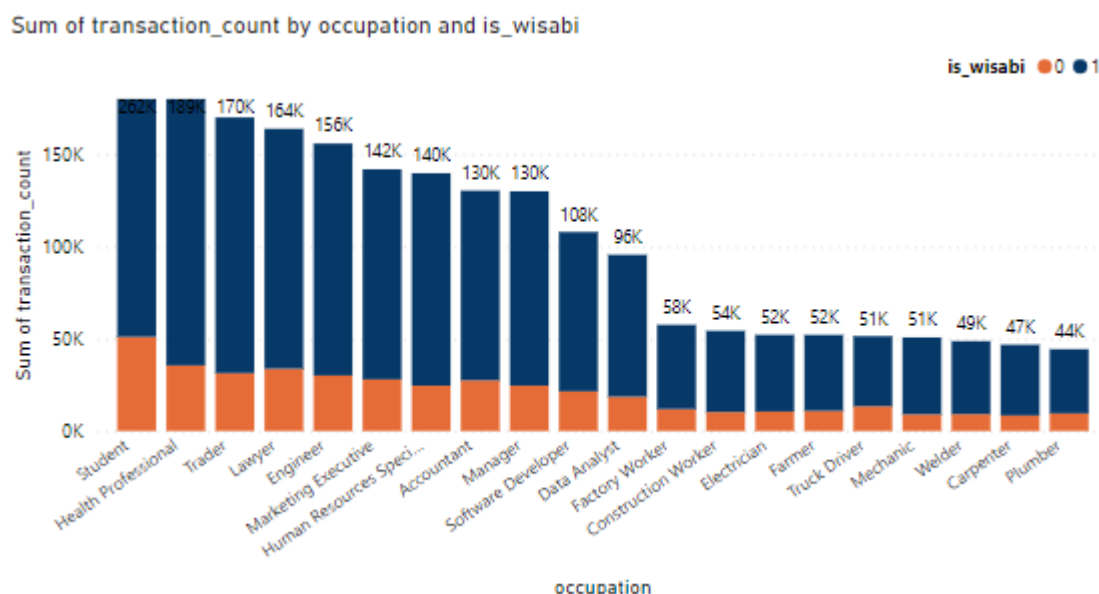
Sum of TransactionCount by occupation and transaction_type_id



Insights: Withdrawal" transactions are notably more common among customers specifically among students compared to other transaction types, suggesting a greater reliance on cash for daily expenses.

Query 8:

is_wisabi	occupation	transaction_count
1	Health Professional	153323
1	Factory Worker	45669
1	Data Analyst	76927
1	Manager	105311
0	Truck Driver	13461
0	Trader	31371
1	Human Resources Specialist	115146
1	Marketing Executive	113878
1	Electrician	41587
1	Engineer	125719
0	Manager	24640
0	Lawyer	33805
1	Trader	138634
0	Health Professional	35593
0	Farmer	10943
0	Carpenter	8460
1	Construction Worker	44006
1	Plumber	34820
1	Student	210481
1	Lawyer	130046



Insights: The query shows that there is significant variation in transaction behavior across different occupations. In particular, "students" have a much higher transaction count compared to other occupations, indicating that they engage in financial transactions more frequently. Also, this indicates that customer behavior varies based on their professions and financial needs.

Recommendations:

1. Given that "withdrawal" transactions are the most common, consider increasing ATM availability in areas with high transaction demand to ensure that customers have convenient access to cash. Optimize ATM maintenance schedules to minimize downtime, especially for ATMs in high-traffic areas. Implement real-time monitoring and alerts for ATM cash levels to prevent cash shortages, which could disturb withdrawal transactions. Influence the understanding of transaction types to customize service offerings. For example, offer promotions or incentives for using ATMs for "withdrawal" transactions, such as fee waivers or rewards programs. To increase the transfer rate, develop user-friendly and secure mobile banking apps, consider reducing or eliminating fund transfer charging fees, and offer promotions or incentives for using transfer services like cashback rewards, discounts, or loyalty points for customers who make a specific number of transfers in a specified period, and lastly provide educational resources and guides on how to make secure and efficient fund transfers because customers may be more likely to use these services if they understand them better. To maximize the deposits, offer competitive interest rates on savings accounts. High-yield savings accounts can attract customers looking for better returns on their savings. Highlight the bank's commitment to security and trustworthiness in all communications. Customers are more likely to deposit their funds in banks they observe as secure.

2. For customers with savings accounts who tend to withdraw larger amounts, offer customized promotions or services that align with their preferences, for example, reduce monthly maintenance fees or withdrawal fees, and run occasional promotions like referral bonuses to attract new savings account holders.
3. Consider relocating or adding ATMs in cities with fewer machines but high transaction volume to reduce customer wait times and improve service quality. Introduce self-service kiosks or mobile banking options in areas with limited ATM access to provide alternative transaction channels and reduce pressure on ATMs.
4. Utilize the knowledge of seasonal trends in transaction amounts to optimize cash reserves. Allocate cash resources more efficiently by ensuring higher reserves during peak transaction months and adjusting them during periods of lower activity. This proactive approach can minimize the risk of cash shortages during high-demand periods. Create marketing campaigns that align with the specific needs and behaviors of customers during peak months. For instance, promote savings accounts or loan products during times when transaction averages are high, or offer targeted promotions and incentives to attract more customers during these periods. Develop and promote seasonal financial products to cater to customers during peak months like offering special holiday-themed savings accounts or credit card rewards programs that coincide with increased spending.
5. Continuously monitor and analyze transaction volume trends to identify not only peak months but also emerging patterns and shifts in customer behavior.
6. Develop and offer financial products and services tailored to the specific needs and behaviors of students. Consider student-friendly accounts, low-fee or no-fee options, and educational resources designed to help students manage their finances effectively. Offer financial literacy programs and resources geared toward students to help them make informed financial decisions. Topics may include budgeting, saving, and responsible credit usage. Highlight specific services that align with the transaction behaviors of each occupation. For example, emphasize cash management solutions for students who rely more on cash transactions.
7. Actively seek feedback from customers in different occupations to understand their experiences and gather suggestions for improvement. Use this feedback to refine services and offerings. Develop a long-term strategy that incorporates occupational segmentation and customization of banking services. This approach ensures that the bank remains adaptable and responsive to changing customer needs over time.