

FINANCE

Data Analysis

Power BI | DAX | Analysis

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PROBLEM STATEMENT

You are a Financial Data Analyst tasked with analyzing credit card usage and financial metrics for a banking institution. Using the provided data, you will create reports in Power BI by applying DAX functions. Your goal is to calculate financial metrics like running totals, moving averages, and growth rates, and generate KPIs that assess customer behavior, credit utilization, and delinquency risk. The analysis will provide key insights for improving customer retention and financial performance.



PROBLEM STATEMENTS

1. Running Total of Credit Card Transactions
2. Calculate the 4-week moving average of the creditLimit for each client.
3. Calculate the mom% growth and wow% groth on transaction amount.
4. Calculate Customer Acquisition Cost (CAC) as a Ratio of Transaction Amount.
5. Calculate the yearly average of avg_utilization_ratio for all clients
6. Calculate the percentage of Interest_Earned compared to Total_Revolving_Bal for each client.
7. Calculate Top 5 Clients by Total Transaction Amount.
8. Identify clients whose Avg_Utilization_Ratio exceeds 80%.
9. Customer Churn Indicator: Create a KPI that flags clients who have not made any transactions ($Total_Trans_Amt = 0$) in the last 6 months.



PROBLEM STATEMENTS



10. Delinquency Rate: Calculate the percentage of clients with `Delinquent_Acc > 0`.
11. Credit Risk Score: Create a score for each client based on their `Avg_Utilization_Ratio`, `Delinquent_Acc`, and `Total_Revolving_Bal`.
12. Income vs Credit Limit Correlation: Show the correlation between `Income` and `Credit_Limit` for all clients.
13. Customer Satisfaction Score by Credit Card Category: Calculate the average `Cust_Satisfaction_Score` by `Card_Category`.
14. Loan Approval vs Credit Limit: Analyze how `Credit_Limit` affects `Personal_loan` approval by calculating the average credit limit for clients with and without loans.
15. High Risk Clients Flag: Create a flag for clients whose `Total_Revolving_Bal` exceeds 90% of their `Credit_Limit` and who have a high `Avg_Utilization_Ratio`.

DATA OVERVIEW

This analysis combines Credit Card and Customer datasets to examine clients' credit behavior, demographics, and risk factors.

1. Credit Card Dataset: Key Info: Includes details like Credit_Limit, Total_Revolving_Bal, Total_Trans_Amt, and Avg_Utilization_Ratio. Focus: Tracks spending habits, credit utilization, and risk indicators (e.g., Delinquent_Acc).

2. Customer Dataset: Key Info: Demographic and financial attributes such as Income, Education Level, and Customer Satisfaction Score. Focus: Provides insights into customer profiles and satisfaction.

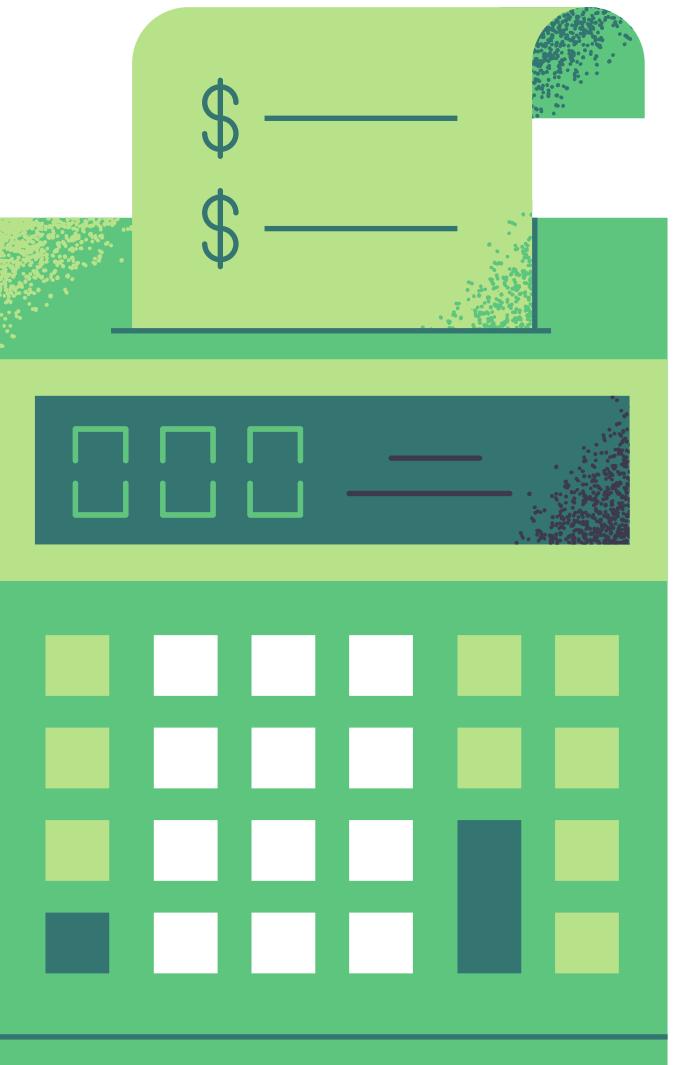


KEY ANALYSIS CONDUCTED



- Financial Metrics: Running totals, moving averages, and growth rates for transactions.
- Risk Indicators: Delinquency rates, credit risk scores, and high-risk client flags.
- Behavioral Insights: Retention, churn indicators, and transaction patterns.
- Correlations: Examined income vs. credit limit and loan approvals vs. credit limits.

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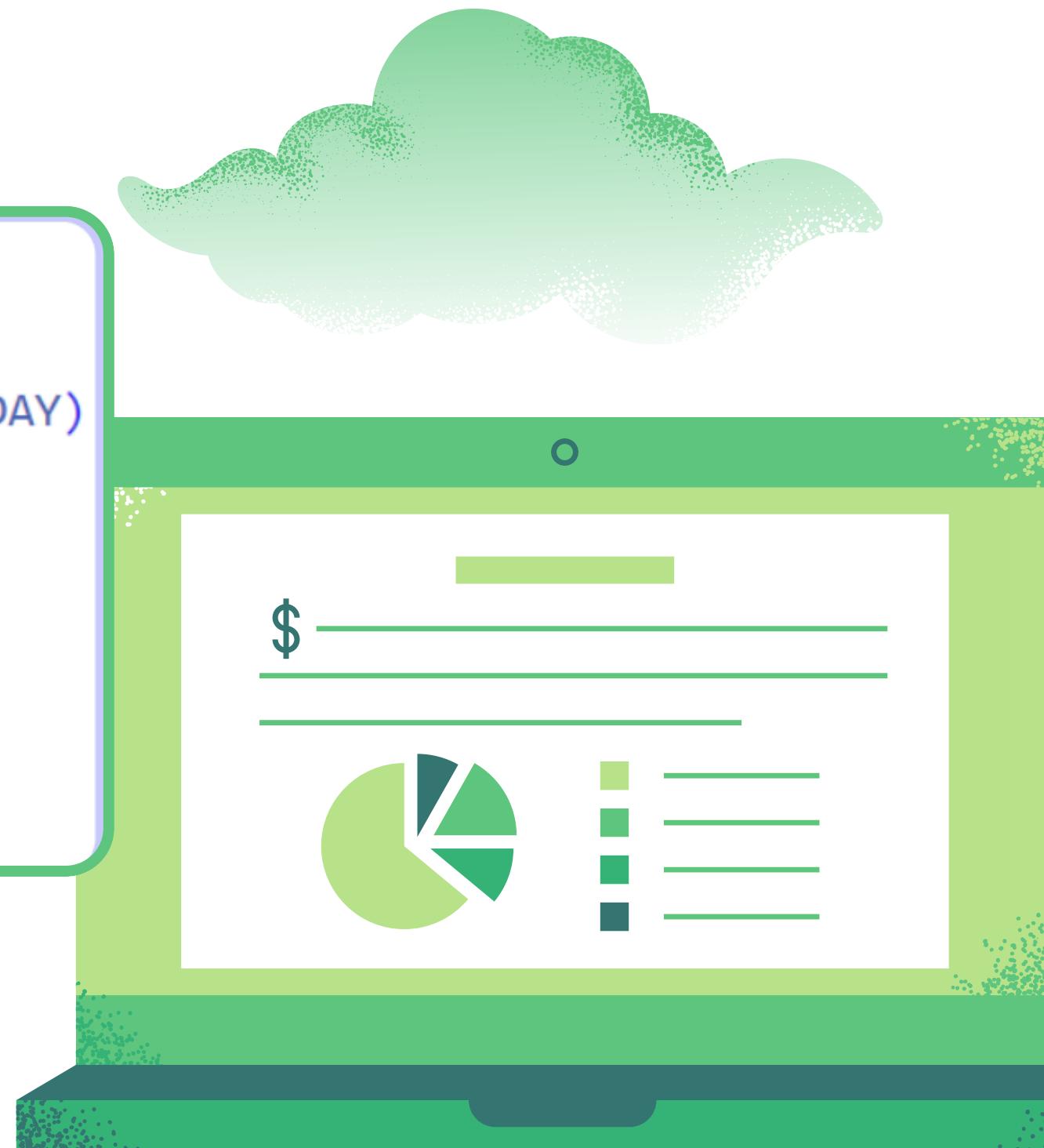
RUNNING TOTAL OF CREDIT CARD TRANSACTIONS

```
running total =  
  
CALCULATE(sum('credit_card'[Total_Trans_Amt]), FILTER(all('credit_card'),  
'credit_card'[Week_Start_Date] <= max('credit_card'[Week_Start_Date])))
```



CALCULATE THE 4-WEEK MOVING AVERAGE OF THE CREDITLIMIT FOR EACH CLIENT

```
moving_average =  
  
var weeks = DATESINPERIOD('calender'[Date], MAX('calender'[Date]), -28, DAY)  
  
var sales = CALCULATE(sum(credit_card[Credit_Limit]), weeks)  
  
var dis_week = CALCULATE(DISTINCTCOUNT('calender'[weeknum]), weeks)  
  
return divide(sales,dis week)
```



CALCULATE THE MOM% AND WOW% GROWTH ON TRANSACTION AMOUNT

```
mom%growth =  
  
var prev_month = CALCULATE(sum('credit_card'[Total_Trans_Amt]), DATEADD('calender'[Date], -1, MONTH))  
  
return DIVIDE(sum('credit_card'[Total_Trans_Amt])-prev_month, prev_month, 0)
```

```
wow%growth =  
  
var prev_week = CALCULATE(sum('credit_card'[Total_Trans_Amt]), DATEADD('calender'[Date], -7, DAY))  
  
return DIVIDE(sum('credit_card'[Total_Trans_Amt])-prev_week, prev_week, 0)
```

CALCULATE CUSTOMER ACQUISITION (CAC) AS A RATIO OF TRANSACTION AMOUNT



```
cac_ta = DIVIDE  
(sum('credit_card'[Customer_Acq_Cost]),  
sum('credit_card'[Total_Trans_Amt]))
```

CALCULATE THE YEARLY AVERAGE UTILIZATION RATIO FOR ALL CLIENTS



```
cac_ta = DIVIDE  
(sum('credit_card'[Customer_Acq_Cost]),  
sum('credit_card'[Total_Trans_Amt]))
```

PERCENTAGE OF INTEREST_EARNED COMPARED TO TOTAL_REVOLVING_BAL FOR EACH CLIENT



```
interest_by_rev_bal = DIVIDE(  
    sum('credit_card'[Interest_Earned]),  
    sum('credit_card'[Total_Revolving_Bal]),0)
```

CALCULATE TOP 5 CLIENTS BY TOTAL TRANSACTION AMOUNT



```
top_5_clients_by_transaction_amount =  
  
TOPN(5, SUMMARIZE('credit_card','credit_card'[Client_Num],  
"total amount", sum('credit_card'[Total_Trans_Amt])),[total amount],DESC)
```

CLIENTS WHOSE AVG_UTILIZATION_RATIO EXCEEDS 80%



```
avg_utl_exceeds_80% = if('credit_card'[Avg_Utilization_Ratio] > 0.8, True, False)
```

CUSTOMER CHURN INDICATOR: CREATED KPI THAT FLAGS CLIENTS WHO HAVE'NT MADE ANY TRANSACTIONS (TOTAL_TRANS_AMT = 0) IN THE LAST 6 MONTHS.

```
no_trans_in_last_6_months =  
  
var months_6 = CALCULATE(sum('credit_card'[Total_Trans_Amt]),  
| | | | DATESINPERIOD('calender'[Date],max('calender'[Date]),-6, MONTH))  
  
return IF(ISBLANK(months_6), TRUE, FALSE)
```

DELINQUENCY RATE: PERCENTAGE OF CLIENTS WITH DELINQUENT_ACC > 0.



```
delinquency_rate =  
  
var delinquent_acc = CALCULATE(COUNTROWS('credit_card'),'credit_card'[Delinquent_Acc] > 0)  
  
var total_accounts = COUNTROWS('credit_card')  
  
return DIVIDE(delinquent_acc, total_accounts,0)
```

CREDIT RISK SCORE: SCORE FOR EACH CLIENT BASED ON THEIR AVG_UTILIZATION_RATIO, DELINQUENT_ACC, AND TOTAL_REVOLVING_BAL

```
normalized_revolving_balance =  
  
var min_value = min('credit_card'[Total_Revolving_Bal])  
  
var max_value = max('credit_card'[Total_Revolving_Bal])  
  
return DIVIDE('credit_card'[Total_Revolving_Bal]-min_value, max_value-min_value,0)
```

We then give weightage to the terms:

Avg_Utilization_Ratio - 50%

Delinquent_Acc - 30%

Normalised_Revolving_Balance - 20%

To create the credit risk score, we first normalize the revolving balance to a number between 0 and 1.

```
credit_risk_score =  
  
0.5 * 'credit_card'[Avg_Utilization_Ratio]+  
0.3 * 'credit_card'[Delinquent_Acc]+  
0.2 * 'credit_card'[normalized_revolving_balance]
```

INCOME VS CREDIT LIMIT : CORRELATION BETWEEN INCOME AND CREDIT_LIMIT FOR ALL CLIENTS

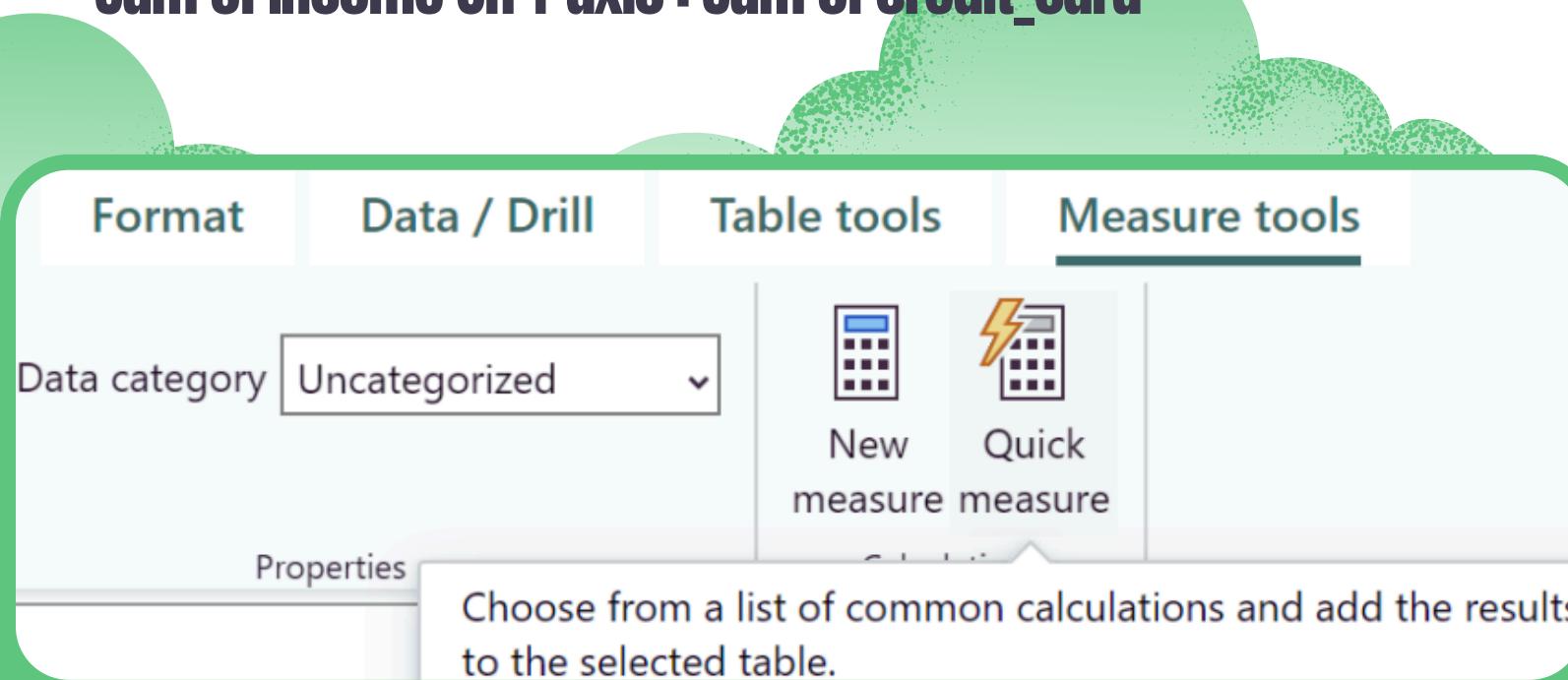
We start by creating a quick measure, choosing correlation coefficient.

Assign client_num to the Category, Sum of Income to Measure X & Sum of Credit_Limit to Measure Y.

0.13

Income and Credit_Limit correlation for Client_Num

Go to Quick measures -> Under Calculation -> In mathematical operations (Correlation coefficient) -> In category : Client_Num On X-Axis : Sum of Income On Y axis : Sum of credit_card



Quick measure

Select a calculation to create a measure.

Select a calculation

Rolling average

Totals

Running total

Total for category (filters applied)

Total for category (filters not applied)

Mathematical operations

Addition

Subtraction

Multiplication

Division

Percentage difference

Correlation coefficient

Text

Star rating

Quick measure

Select a calculation to create a measure.

Correlation coefficient

Calculate the correlation coefficient between two values over a category. Originally suggested by Daniil Maslyuk in the quick measures gallery. [Learn more](#)

Category ⓘ

Client_Num

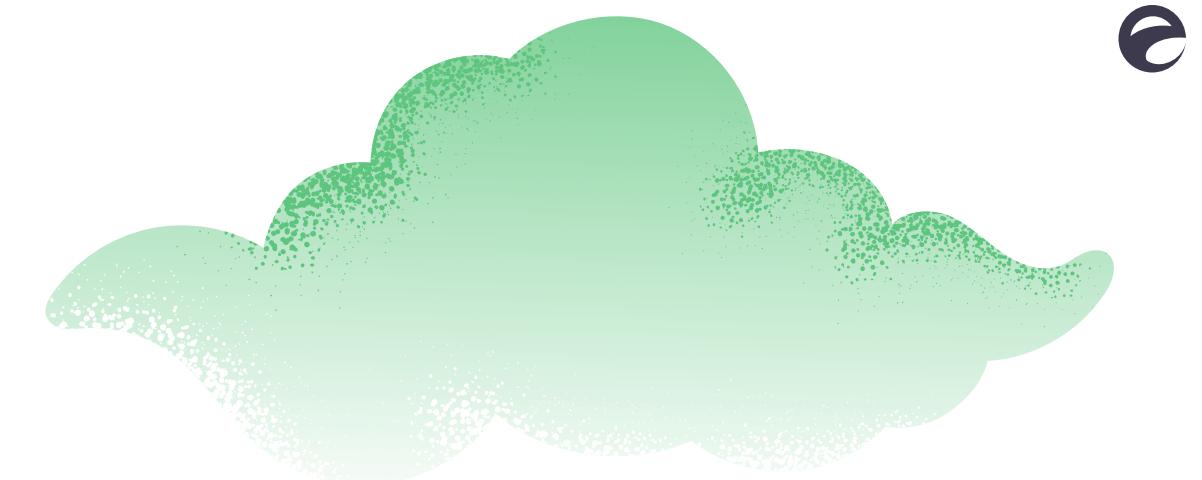
Measure X ⓘ

Sum of Income

Measure Y ⓘ

Sum of Credit_Limit

CALCULATE THE AVERAGE CUST _ SATISFACTION _ SCORE BY CARD _ CATEGORY.



```
avg_score_by_card_category =  
  
SUMMARIZE('credit_card','credit_card'[Card_Category],  
"avg score",ROUND(AVERAGE('customer_data'[Cust_Satisfaction_Score]), 2))
```



ANALYZE HOW CREDIT_LIMIT AFFECTS PERSONAL_LOAN APPROVAL BY CALCULATING THE AVERAGE CREDIT LIMIT FOR CLIENTS WITH AND WITHOUT LOANS.

```
loan_yes = CALCULATE(AVERAGE('credit_card'[Credit_Limit]),  
'customer_data'[Personal_loan] = "yes")
```

```
loan_no = CALCULATE(AVERAGE('credit_card'[Credit_Limit]),  
'customer_data'[Personal_loan] = "no")
```

CREATE A FLAG FOR CLIENTS WHOSE TOTAL_REVOLVING_BAL EXCEEDS 90% OF THEIR CREDIT_LIMIT AND WHO HAVE A HIGH AVG_UTILIZATION_RATIO.

```
exceeds_90%_of_creditLimit =  
  
var cl_90 =  
  
'credit_card'[Client_Num]*0.9  
  
return if('credit_card'[Total_Revolving_Bal] >cl_90 = True, False)
```

THANK YOU



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