



Banking Insights Analysis using SQL

Prepared by

Chioma Ezeamii

Business Intelligence & Data Analyst

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1. Project Overview

This project simulates a real-world banking analytics scenario where I performed data analysis using SQL Server Management Studio (SSMS) on a relational database containing customer, transaction, branch, and account data.

The goal was to extract actionable insights to help business teams understand customer behavior, branch performance, transaction patterns, and channel utilization.

2. Problem Statement

Financial institutions often struggle to identify patterns in customer transactions and branch operations due to large data volumes and disconnected data sources.

The task was to:

- Build a structured database for banking operations.
- Write optimized SQL queries to uncover key business insights.
- Simulate dashboards and reports used by business analysts and risk teams.

3. Database Design

Tables Created:

- **Customers:** Customer demographics and contact information.
- **Accounts:** Account details, business segment, and account type.
- **TransactionHistory:** Records of all transactions, including date, amount, and status.
- **Branch:** Contains branch information, region, and branch head.
- **AlternateChannels:** Captures channel usage such as POS, Mobile, ATM, and Web.
- **Transaction Archives:** Historical transaction tables from 2019–2024.

4. SQL Objectives

1. Customer segmentation and profiling.
2. Transaction trend and revenue analysis.
3. Branch and regional performance monitoring.
4. Transaction channel utilization.
5. Account type and business segment performance.

5. Analytical Queries & Insights

A. Customer Segmentation Analysis

- Classified customers into Young (18 - 29), Adult (30 - 44), and Old (45+) categories.
- Found that Adult customers (30 - 44) represented the majority, with the highest average account balance.

Insight: Marketing campaigns should focus on adults in the 30 - 44 range as they maintain stronger balances and frequent transactions.

B. Transaction Summary by Gender & Status

- Segmented transactions by gender and success status.
- Identified that female customers performed slightly higher successful transaction volumes.

Insight: Enhance mobile app experience targeting female users to maintain engagement.

C. Active Customer Check

- Detected customers who haven't transacted in **over 12 months** despite active accounts.

Insight: The **inactive segment** could be reactivated through loyalty programs or account engagement campaigns.

D. Transaction Trend Analysis

- Combined monthly transaction archives (January - November) to track monthly revenue and transaction volume.
- Calculated: Month-over-month (MoM) growth rate.
 3-month moving average for revenue and transaction volume.
 Rank by total transaction value.

Insight:

- **October** recorded the highest transaction volumes.
- **Early-year months** showed lower activity due to reduced spending behavior.

E. Branch & Regional Performance

- Ranked branches by total transaction amount.
- Calculated branch contribution percentage to total performance.
- Aggregated performance by region.

Insight:

- **North Region** contributed the highest share of total transactions (~35%).
- **Top 3 Branches** accounted for nearly 90% of the bank's transaction value.

F. Transaction Channel Analysis

- Compared usage frequency across USSD, MobileApp, ATM, and Online banking.

Insight:

- **Online banking** showed the highest usage frequency, followed by **Mobile banking**.

G. Account Type & Business Segment Performance

- Aggregated data by **AccountType** (Savings, Current, Corporate) and **BusinessSegment** (Retail Banking vs Business Banking).

Insight:

- **Savings Accounts** generated the highest transaction account.

6. Tools & Techniques Used

- SQL Server Management Studio (SSMS)
- SQL Window Functions (RANK, LAG, DENSE_RANK)
- Aggregations (SUM, COUNT, AVG)
- Joins, CTEs, and Subqueries
- CASE Expressions and Date Functions

7. Key Results Summary

Area	Key Metric	Key Finding
Customer Profile	68% Adults (30–44)	Highest balance group
Revenue Trend	+12% MoM growth (July)	Peak month for activity
Regional Ranking	North 1st	35% share of transactions
Channel Usage	Online banking	Top-used digital platform
Account Segment	Business	Highest average amount

8. Impact

These SQL analyses replicate how data analysts in the banking industry monitor performance and customer engagement.

Insights derived from these queries could guide:

- Customer retention initiatives.
- Regional performance tracking.
- Channel optimization strategies.
- Product profitability analysis.