



Innovation & Entrepreneurship Hub for Educated Rural Youth (SURE Trust – IERY)

Bank Branch Profitability Analysis

A Risk-Adjusted Approach to Measuring Branch Performance and Efficiency

The domain of the Project:
POWER BI

Capstone Project
by
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In Guidance
of
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(Finance & Analytics Professional at Dell Technologies)

Period of the project

November 2025 to December 2025



Innovation & Entrepreneurship Hub for Educated Rural Youth (SURE Trust – IERY)

DECLARATION

The project titled "**Bank Branch Profitability Analysis**" has been mentored by **Mr. Abhishek Ramachandran**, organised by SURE Trust, from November 2025 to December 2025, for the benefit of the educated unemployed rural youth for gaining hands-on experience in working on industry relevant projects that would take them closer to the prospective employer.

I, Mr. Pankaj Machiya Deori, hereby declare that I was the sole contributor for the completion of this project under the guidance of my mentor. This project has significantly enhanced my practical knowledge and skills in the domain.

Mr. Abhishek Ramachandran
Finance & Analytics Professional
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Prof. Radhakumari
Executive Director & Founder
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EXECUTIVE SUMMARY

Overview: This project, "**Bank Branch Profitability Analysis**", is a comprehensive Power BI analytics tool designed to assess the financial health of a bank's branch network. Over a three-year period, the bank generated **\$5.36 billion** in Net Profit with a margin of **33.10%**. However, the headline numbers often hide underlying risks. The primary goal of this analysis was to move beyond simple "**Net Profit**" and evaluate branches based on **efficiency** and **risk-adjusted returns (RAR)**.

Key Findings

- **The Risk Region:** The East region generates the most revenue **\$5.3bn**, but it is our most volatile and expensive region. It makes money simply because it is huge, not because it has a very smart operational framework.
- **The Cost Problem:** Our cost-structure is very rigid. **90%** of our costs are fixed (**60% Salaries, 30% Rent**). We cannot cut costs fast enough when business slows down. We lack flexibility to deal with economic downturns.
- **The Hidden Risk:** Our top-performing branch (**Houston**) is profitable but runs a high liquidity risk with an **82%** Loan-to-Deposit Ratio.
- **The Future Risk:** When we simulated a **+1%** interest rate shock our Profit Margin boosted from **33%** to nearly **40%**. This shows that our bank is very sensitive to future rate changes. Our inefficient branches are the ones that are most vulnerable to these rate changes.

Recommendations

- Replicate Branch **6016's (Houston)** operational model (**High Efficiency + Active Lending**). We should try to get other branches to lower their costs to match Houston's level (Cost-to-Income of 55%).
- Introduce performance-based bonuses or commissions, making a portion of compensation variable and tying it directly to the company's performance and sales. So, whenever the revenue goes down, salary expenses also go down along with it.
- Conduct an operational audit for "**Bottom 10 Branches**", for potential closure or downsize of specific branches to reduce the fixed real estate burden.
- Implement automated monitoring system to flag out branches with **LDR > 75%** (like Houston), to make sure the branches have enough cash reserves to stay out of **Liquidity Crisis**.



INTRODUCTION

Project Overview: In the banking sector, revenue volume does not always equate to health. Branches with high revenues may also have disproportionately high operating costs or volatile profits. Branch managers need a way to normalize performance to make fair comparisons between small, efficient branches and large, expensive ones.

Problem Statement: The bank lacked a unified view of branch efficiency. There was no mechanism to rank branches based on risk (volatility) or to simulate how external economic factors (like interest rate changes) would impact the bottom line.

Scope and Limitations

- **Scope:** Analysis of 40 branches across 5 regions over 3 years (2023-2025). Focus areas include Profitability, Loan Performance, and Operational Expenses.
- **Limitations:** The analysis is based on historical data. While we used "What-If" scenarios to predict future risks, we cannot account for unforeseen external economic events (like a sudden global recession).

Innovation Component: The project introduces a "**Risk-Adjusted Return**" (RAR) model, which penalizes branches with volatile monthly profits, and a **dynamic "What-If" simulator** that allows users to test interest rate sensitivities in real-time.



PROJECT OBJECTIVES

Primary objectives

- **Assess True Health:** To move beyond Net Profit and evaluate branches based on efficiency (Cost-to-Income Ratio) and stability (Profit Volatility).
- **Identify Structural Weaknesses:** To analyze the bank's expense breakdown and understand why costs do not drop when revenue drops.
- **Stress Testing:** To simulate how a change in interest rates (e.g., +/- 1%) would impact the profitability of different branches.

Specific objectives

- **Data Modeling:** Create a robust Star Schema model from raw Excel files (Deposits, Loans, Fees, Expenses, etc.).
- **KPI Development:** Calculate core metrics (Profit Margin, Cost-to-Income) and advanced metrics (RAR, Profit Volatility Index).
- **Scenario Analysis:** Develop a simulation tool to forecast the impact of interest rate shocks ($\pm 1\%$) on Net Interest Income.
- **Benchmarking:** Implement drill-through features to compare individual branch performance against regional peers.



METHODOLOGY AND RESULTS

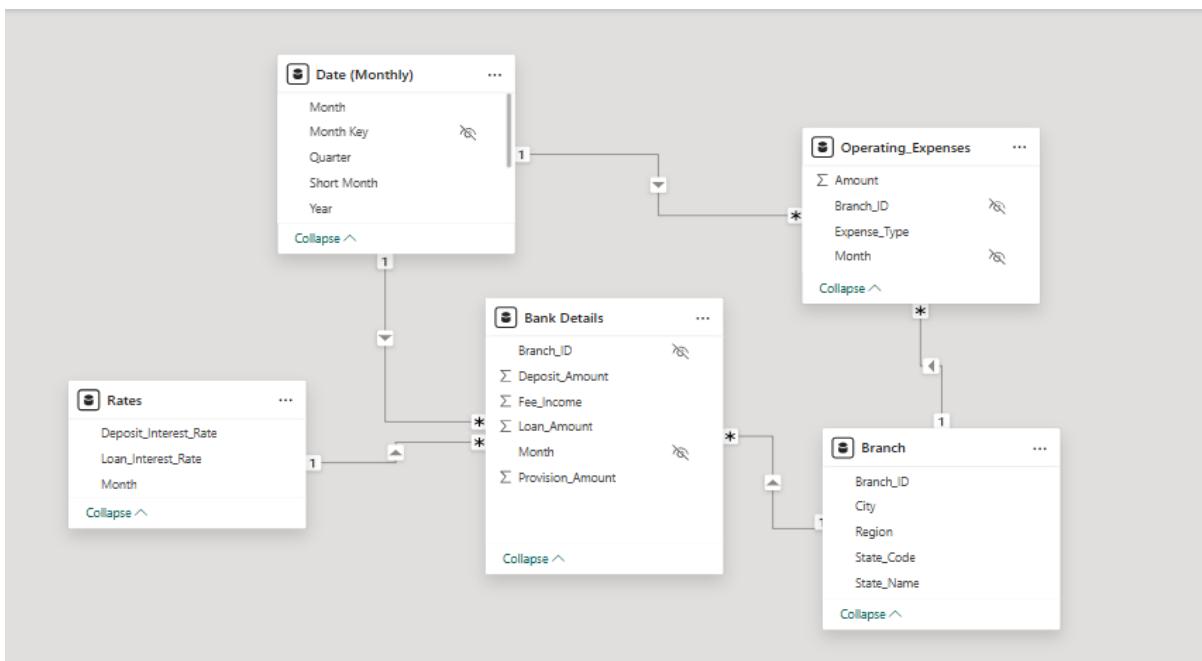
1) Tools/Technology Used

- Data Processing:** Excel, Power Query (for ETL).
- Visualization & Modeling:** Microsoft Power BI Desktop.
- Language:** DAX (Data Analysis Expressions).

2) Data Collection & Architecture

The raw data consisted of separate tables for Loans, Deposits, Fees, Provisions, and Expenses.

- ETL Process:** Using Power Query, I merged the transactional tables into a central **Fact table “Bank_Details”** table. I standardized the date grain to "Monthly" to align financial transactions with operating expenses.
- Data Model:** I designed a **Star Schema**. The model connects two Fact tables (Bank Details, Operating Expenses) to shared Dimension tables (Branch, Date (Monthly), Rates). This ensured fast query performance and accurate filtering.



(Figure 1: The Star Schema Data Model showing relationships between Fact and Dimension tables)

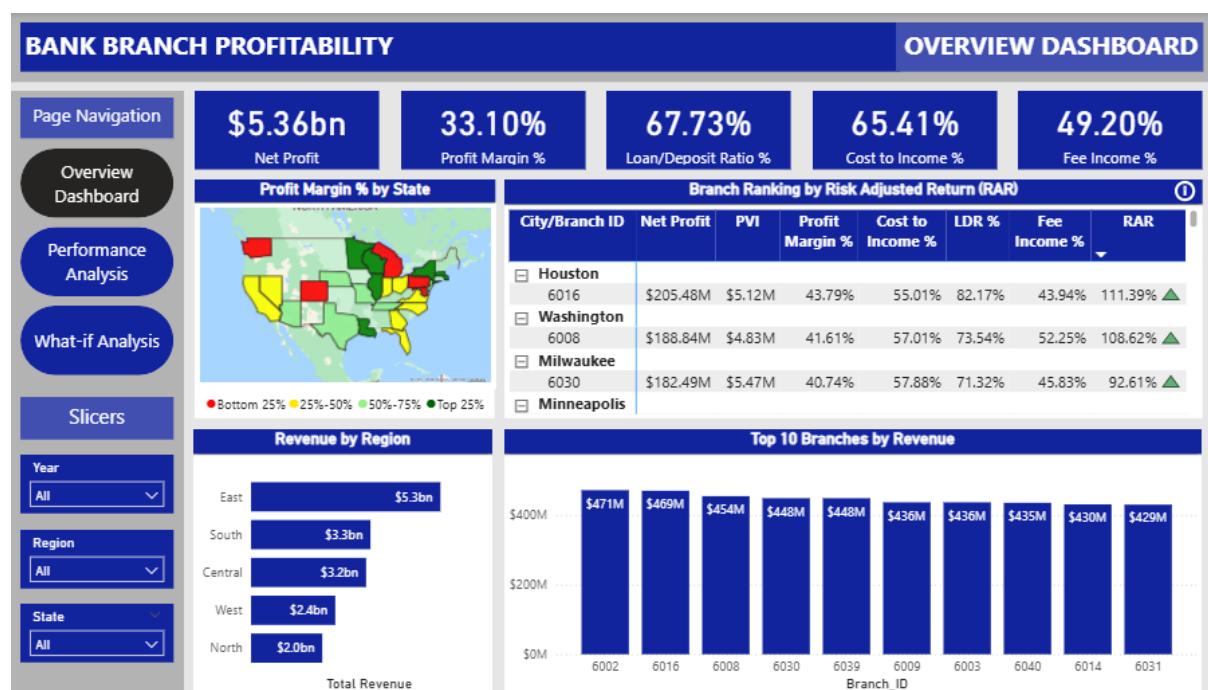


3) Project Results (Dashboard Views)

1. Overview Dashboard: This page serves as the main summary for bank managers, but it requires a careful look to see the truth. At first glance, the headline numbers look very strong, showing a total Net Profit of **\$5.36 billion** and a healthy profit margin of **33.10%**. However, the dashboard visuals quickly reveal that "bigger" does not always mean "better."

When we look at the "**Revenue by Region**" bar chart, the **East Region** dominates the bank, bringing in **\$5.3 billion** in revenue. You might expect the East to also be the best performer. But the "**Branch Ranking by Risk-Adjusted Return (RAR)**" table on the right tells a completely different story. The branches at the top of this list are not from the East, they are branches like **Houston** (from the South) and **Washington** (from the Central region), which have RAR scores over **100%**.

This point is further proven by the "**Profit Margin % by State**" map. This visual uses color-coding to show profitability by state. We can see several "red zones" (indicating the bottom 25% of profit margins) located in our largest and busiest cities. This confirms the key insight from the Executive Summary: The bank is making money simply because it has a massive volume of customers, not because it is running efficiently. We are mistaking volume for quality.



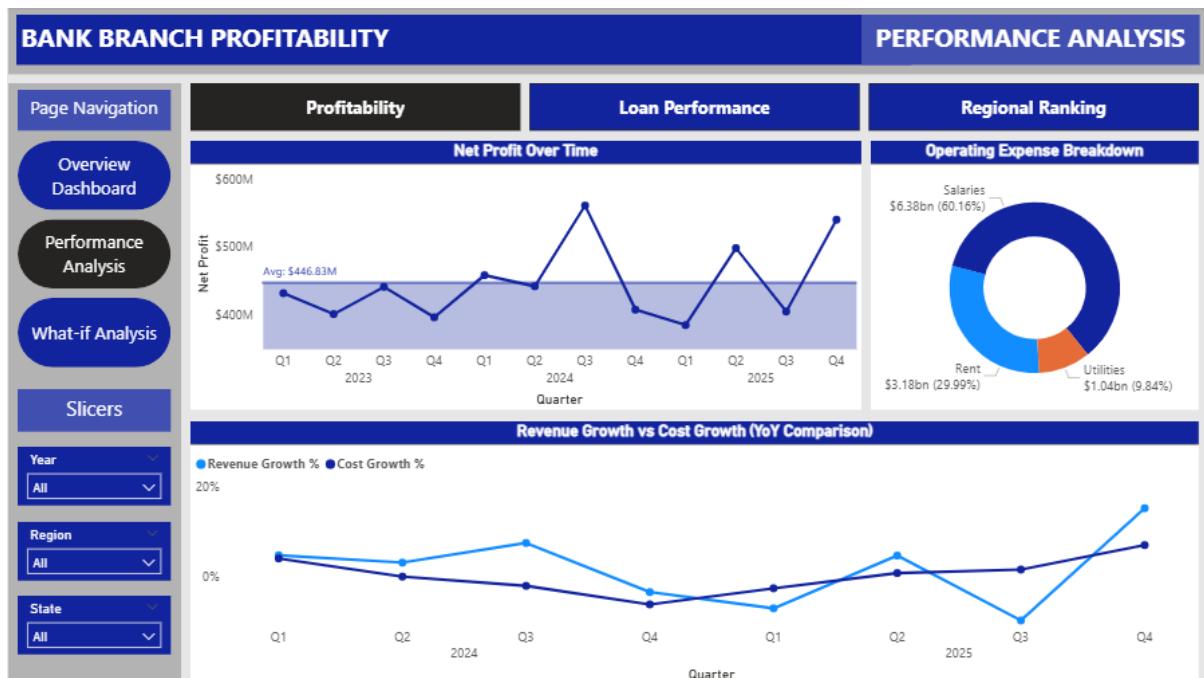
(Figure 2: Full page view of the Overview Dashboard)



2. Performance Analysis Dashboard

i) Profitability View : This page allows us to look deep down to understand why our profits are going up and down so much. The most critical finding here comes from the "**Operating Expense Breakdown**" (the donut chart). It shows that a massive **90% of our operating costs are fixed**, meaning the bank must pay them every month regardless of how much money we make. This consists of **Salaries (60.16%)** and **Rent (29.99%)**.

The danger of this rigid structure is visualized in the "**Revenue Growth vs Cost Growth**" line chart at the bottom. Ideally, when revenue drops, costs should drop too. But looking at **Q1 2025 and Q3 2025**, we see a warning sign that is, the revenue growth dipped (the light blue line went down) but cost growth (the dark blue line) stayed flat or even increased. Because we couldn't cut salaries or rent fast enough to match the drop in sales, our profit margin was squeezed. This visual proof supports the finding that the bank lacks the "flexibility" to handle bad economic times or sudden market downturns.

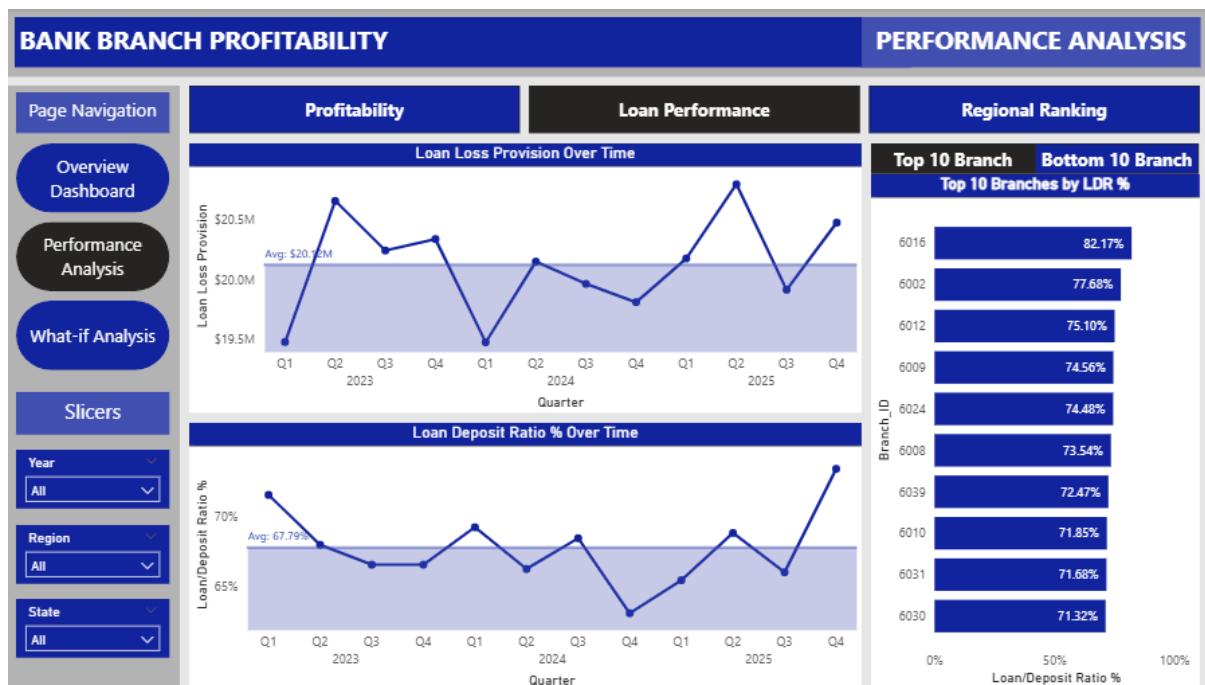


(Figure 3: Full page view of the Profitability Bookmark View)



ii) Loan Performance View: This page investigates how aggressively the bank is lending money, revealing a major hidden risk in our business model. The "**Top 10 Branches by LDR %**" chart highlights that our top-performing branch, **Houston (Branch 6016)**, has a Loan-to-Deposit Ratio (LDR) of **82.17%**. This is significantly higher than the bank's average LDR of **67.73%**.

While lending out more money explains why Houston generates such high profits, it is a double-edged sword. An LDR of 82% means that for every \$100 customers deposit, Houston has lent out \$82, leaving very little cash in the vault. This triggers a serious **Liquidity Warning**. If a large number of customers suddenly decided to withdraw their money, Houston would not have enough cash on hand to pay them. This dashboard view confirms that our most profitable branches are running on the edge, prioritizing short-term profit over long-term safety.



(Figure 4: Full page view of the Loan Performance Bookmark View)



iii) Regional Ranking View: This view compares the five regions side-by-side to determine who is really managing their business best. The "Risk vs Reward by Region" scatter plot is the most powerful visual here. The vertical axis measures "Profit Volatility" (Risk) and the horizontal axis measures "Net Profit" (Reward).

You can clearly see the **East Region** (the dark blue dot) positioned high up on the chart. This means that while it brings in high profit, it comes with very high instability and risk. In contrast, the **South Region** (the purple dot) sits in the "sweet spot" in the middle. It delivers stable returns without the extreme ups and downs. The "Regional KPI Scorecard" table below confirms why: The South achieves a **35.49% Profit Margin** because it keeps its costs lower than the East. This proves that the South is the "Model Zone" we should try to copy across the rest of the bank.



(Figure 5: Full page view of the Regional Ranking Bookmark View)



3. What-if Analysis Dashboard: This tool lets us predict the future. The dashboard features a slider where we can simulate an interest rate shock. When we move the slider to increase interest rates by just **1%**, the "**Simulated Profit Margin**" card jumps from **33.10%** to nearly **40%** (39.78%). The total impact on our Net Interest Income is a massive **\$1.80 billion** increase.

While this extra profit looks like good news, it actually proves a "Future Risk." It demonstrates that our bank's success relies heavily on high interest rates, which are outside our control. If the opposite happens and rates dropped by 1%, we would lose that same massive amount of profit. The "**Top 10 Branches by Margin Impact**" list on the right shows that our inefficient branches (like **Branch 6006** and **6029**) are the most sensitive to these changes. They have such thin margins that a rate drop could instantly push them into losing money.



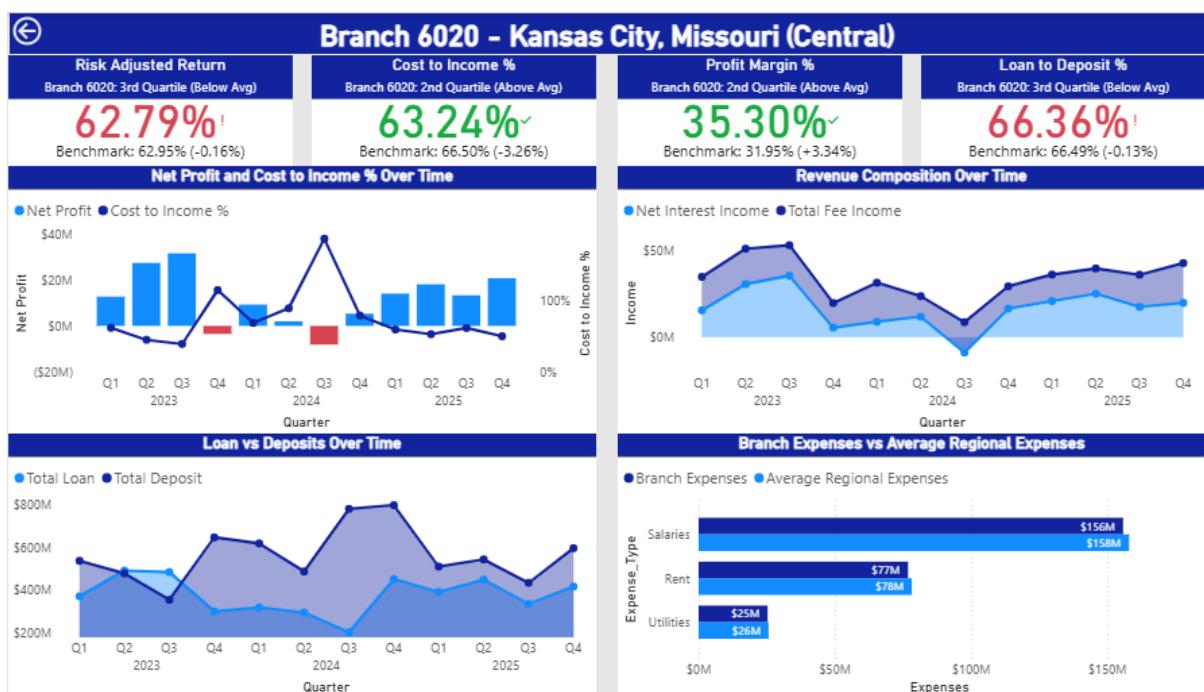
(Figure 6: Full page view of the What-if Analysis Dashboard)



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4. Branch Drill-through Page: This is a detailed "Report Card" designed for individual Branch Managers. Instead of just showing raw numbers, this page uses the new "Peer Quartile Status" formulas to give instant feedback. For example, the sub-header of the KPI card visual for **Branch 6020** immediately flags it as being in the "**3rd Quartile (Below Avg)**" for Risk-Adjusted Return. This removes any guessing about performance.

The visuals on this page help the manager understand why they are behind. The "**Branch Expenses vs Average Regional Expenses**" chart at the bottom right is crucial. It compares the specific branch's spending on Rent and Salaries (dark blue bars) against the average for their region (light blue area). This allows the manager to see, for example, "I am spending \$156M on salaries, which is right on average, but my Rent is higher than my peers." This level of detail creates accountability and helps managers fix specific cost problems rather than just making excuses.



(Figure 7: Full page view of the Branch Drill-through Page)

GitHub Project Repository: <https://github.com/Pankaj-M-Deori/Bank-Branch-Profitability-Analysis>



LEARNING AND REFLECTION

Technical Learnings:

- **Advanced Data Modeling:** I learned the importance of the Star Schema. Initially, I tried to keep everything in one big table, but performance was slow. Breaking it into Fact and Dimension tables made the report faster and the DAX easier to write.
- **DAX Proficiency:** Working with **CALCULATE**, **FILTER**, and **ALL** functions to create the Peer Benchmarking measures was challenging but rewarding. It taught me how to manipulate filter contexts effectively.
- **Visual Storytelling:** I learned that a dashboard isn't just charts, it's a narrative. Using "Information Icons", dynamic titles, and conditional formatting (Red/Green arrows) makes the data accessible to non-technical users.

Domain Knowledge:

- I gained a solid understanding of banking KPIs. I now understand that a high **Loan-to-Deposit Ratio (LDR)** is good for profitability but bad for liquidity risk (e.g., the Houston branch scenario).
- I learned about **Operating Leverage** how fixed costs (Salaries/Rent) can destroy margins if revenue dips slightly, as seen in the 2025 data.



CONCLUSION AND FUTURE SCOPE

Conclusion: The "Bank Branch Profitability Analysis" successfully identifies the structural weaknesses (the rigid cost structure) in the bank's network. We found that efficiency is the primary driver of sustainable profit. The recommendation is to replicate the operational model of the "Houston" branch (High Lending + Low Cost) across the bank's network, especially the underperforming East region branches.

Future Scope

- **Automated Alerts:** Setting up Power BI Service alerts to notify managers immediately if a branch's **LDR exceeds 75%**, ensuring liquidity risks are managed in real time.
- **Row-Level Security (RLS):** Implementing RLS so that Branch Managers can only see data relevant to their specific branch or region, enhancing data security.