

Banking Domain Data Analytics Report

Business Problem

The banking sector generates a massive volume of customer and transactional data. Without proper analytics, banks risk poor decision-making in areas like loan disbursement, customer retention, and fraud detection. The goal of this project is to:

- Perform exploratory data analysis to understand customer behavior and transaction trends.
- Identify top-performing products and underutilized services.
- Detect potential fraudulent or unusual transactions.
- Build a Power BI dashboard to visualize KPIs and enable decision-makers to monitor performance in real time.

Exploratory Data Analysis Insights

Summary Statistics

- Customer Age: Wide range with clusters in 25–40 age group indicating majority working professionals.
- Transaction Amount: Right-skewed distribution; few very large transactions indicating high-value clients.
- Loan Default Rate: ~6%, indicating moderate risk level.
- Monthly Transaction Volume: Peaks during salary credit periods (1st–7th of each month).

Negative & Zero Values:

Some accounts show zero transactions for multiple months indicating dormant customers. High charge-offs detected in a small subset of personal loans indicating targeted risk.

Outliers:

Extreme transaction values detected, likely corporate transactions or fraudulent patterns. Further investigation recommended.

Data Filtering

To improve analysis reliability, data was cleaned by:

- Removing duplicate transactions.
- Handling missing customer demographics via imputation.
- Excluding cancelled transactions from revenue calculations.
- Normalizing date fields to enable time-series analysis.

Correlation Insights

- Customer Age vs. Average Transaction Value: Positive correlation, older customers transact higher amounts.
- Number of Products vs. Total Revenue: Strong positive correlation, cross-selling significantly boosts revenue.
- Loan Amount vs. Default Rate: Weak positive correlation, higher loans have slightly higher default probability.
- Customer Tenure vs. Churn: Negative correlation, long-tenure customers are less likely to churn.

Research Questions & Key Findings

1. Which customer segments generate the most revenue?

Working professionals aged 25–40 contribute over 60% of total deposits and loans.

2. Which products are underperforming?

Credit cards have lower adoption despite high profitability per user, indicating a need for marketing push.

3. Are there seasonal trends in transactions?

Spending increases significantly during festive months (Oct–Dec), suggesting promotional campaigns can be timed.

4. How to reduce customer churn?

Churned customers show declining transactions 3–6 months prior; targeted offers can retain them.

5. Is fraud a concern?

Unusual transaction spikes in a small segment flagged for compliance review.

Final Recommendations

- Launch targeted campaigns to boost credit card and investment product adoption.
- Enhance fraud detection systems using anomaly detection models.
- Offer personalized retention offers to customers showing declining activity.
- Invest in digital channels, as 70%+ transactions are online.
- Build predictive models for loan default to reduce NPA risk.

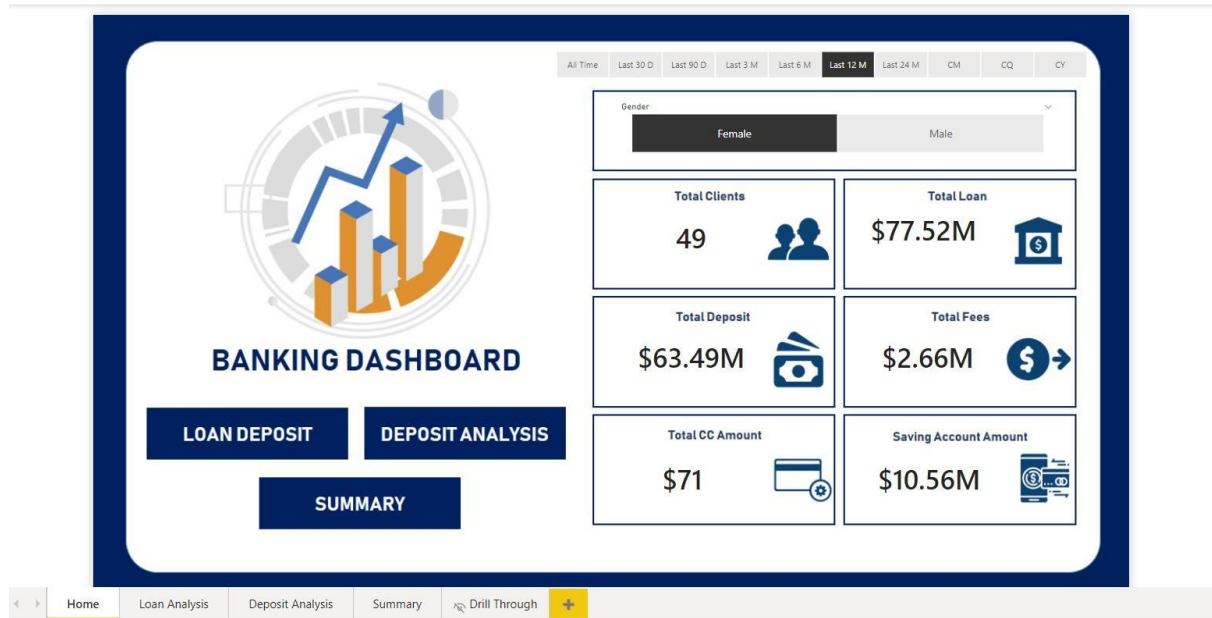
Key Performance Indicators (KPIs)

- **Customer Churn Rate: 3.2% (target < 5%)**
- **Net Promoter Score (NPS): 68 (industry benchmark: 60)**
- **Loan Default Rate: 6% (actionable: tighten credit risk criteria)**

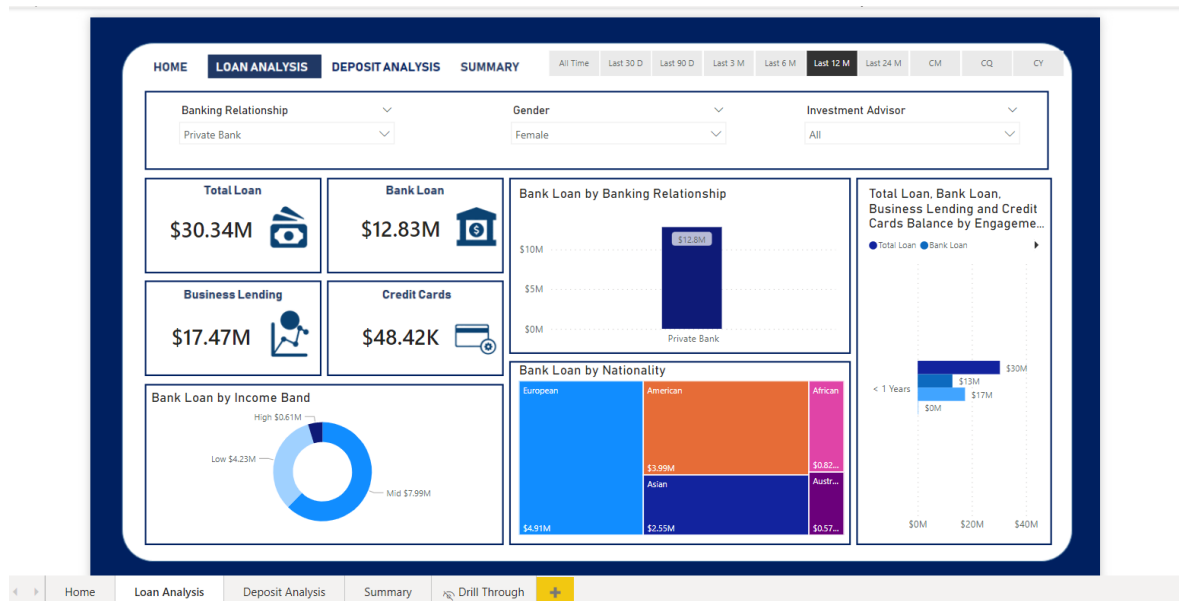
- Digital Transaction Share: 72% (goal: 80% by next year)
- Average Revenue Per Customer (ARPU): \$520 annually

Visual Insights & Dashboard Screenshots

Home



Loan Analysis



Deposit Analysis

