

Bank Loan Report and Dashboard for Enhanced Lending Insights

Background:

A leading financial institution seeks to enhance its understanding of lending activities and improve data-driven decision-making by developing a comprehensive Bank Loan Report. The project aims to provide critical insights into key loan-related metrics, performance trends, and borrower behavior.

Problem Statement:

To effectively monitor and evaluate lending operations, the bank requires an integrated reporting and dashboard solution that offers:

- A clear overview of loan application trends and funded amounts.
- Insights into repayment efficiency and cash flow.
- Evaluation of borrower profiles and loan portfolio health.

The absence of a centralized platform for analyzing loan performance, borrower behavior, and repayment patterns hinders the bank's ability to adapt strategies and ensure sustainable growth.

Proposed Solution:

The Bank Loan Report project focuses on creating three interconnected dashboards—**Summary**, **Overview**, and **Details**—each designed to deliver actionable insights into lending operations.

Dashboard 1: Summary

Objective: To monitor overall lending performance and key metrics over time.

Key Metrics:

1. **Total Loan Applications:** Total count, Month-to-Date (MTD) applications, and Month-over-Month (MoM) changes.
2. **Total Funded Amount:** Total loans disbursed, MTD figures, and MoM variations.
3. **Total Amount Received:** Total repayments received, MTD totals, and MoM trends.
4. **Average Interest Rate:** Portfolio-wide averages, MTD interest rates, and MoM changes.
5. **Average Debt-to-Income Ratio (DTI):** Gauging borrowers' financial health, MTD DTI, and MoM fluctuations.

Good Loans vs. Bad Loans:

The Summary Dashboard will differentiate between "Good Loans" (e.g., Fully Paid and Current) and "Bad Loans" (e.g., Charged Off), offering:

- Good Loan Application Percentage and Funded Amounts.
- Bad Loan Application Percentage and Funded Amounts.
- Total repayments received for each category.

A detailed **Loan Status Grid View** will provide an interactive summary of all loan statuses, enabling users to monitor MTD and MoM metrics, average interest rates, and DTIs.

Dashboard 2: Overview

Objective: To provide a visual analysis of loan trends and metrics across regions, time periods, and borrower profiles.

Charts and Insights:

1. **Monthly Trends by Issue Date (Line Chart):** Visualizing trends in applications, funded amounts, and repayments over time.
2. **Regional Analysis by State (Filled Map):** Highlighting loan metrics by state, showcasing regional lending activity and repayment efficiency.
3. **Loan Term Analysis (Donut Chart):** Segmenting loan metrics by terms (e.g., 36 or 60 months).
4. **Employee Length Analysis (Bar Chart):** Evaluating lending patterns based on borrowers' employment duration.
5. **Loan Purpose Breakdown (Bar Chart):** Categorizing metrics by loan purposes (e.g., debt consolidation, credit card refinancing).
6. **Home Ownership Analysis (Tree Map):** Providing a hierarchical view of loan metrics by home ownership status.

These visualizations enable stakeholders to identify trends, assess borrower profiles, and refine lending strategies effectively.

Dashboard 3: Details

Objective: To create a centralized platform for accessing granular loan data, borrower profiles, and performance metrics.

Features:

- Consolidated view of loan applications, funded amounts, and repayments.
- Borrower-specific insights, including employment length, DTI, and loan purpose.
- Filters for detailed analysis by region, loan status, or loan term.

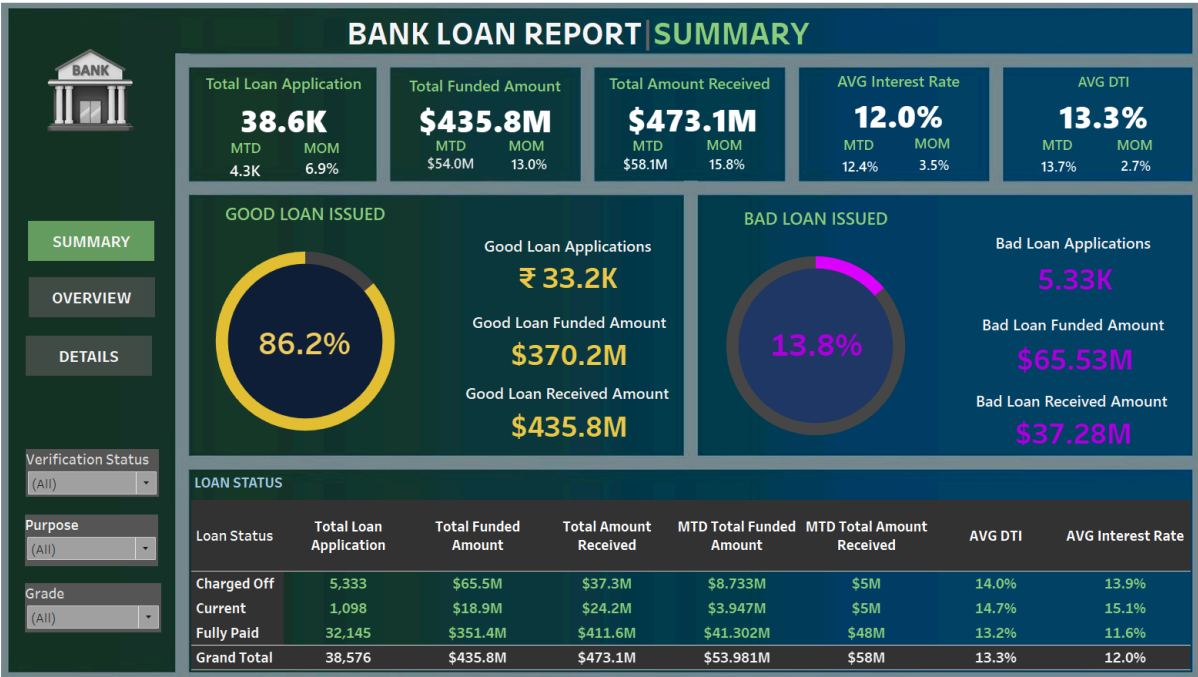
The Details Dashboard ensures users can access vital data efficiently, supporting comprehensive analysis and strategic planning.

Outcome and Strategic Benefits:

By implementing the Bank Loan Report project, the institution aims to:

- Enhance visibility into lending operations and portfolio health.
- Identify high-performing regions, borrower segments, and loan categories.
- Develop targeted marketing and lending policies based on data-driven insights.

Dashboard Overview and Insights



Dashboard 1: Summary Page

The **Summary Dashboard** offers a high-level view of the loan portfolio, providing key performance indicators (KPIs) that help assess the overall health and performance of the bank's lending operations:

- **Total Loan Applications:** 38.6K
- **Total Funded Amount:** \$435.8M
- **Total Amount Received:** \$473.5M
- **Average Interest Rate:** 12%
- **Debt-to-Income (DTI) Ratio:** 13.3%

These KPIs provide a snapshot of the bank's scale and financial performance in lending, offering decision-makers a clear overview of operations.

Loan Classification

- **Good Loans (86.2%)**
 - **Applications:** 33.2K
 - **Funded Amount:** \$370.2M
 - **Received Amount:** \$370.2M

This category demonstrates the bank's successful approval process and effective recovery of payments.
- **Bad Loans (13.8%)**
 - **Applications:** 5.33K
 - **Funded Amount:** \$65.53M

- **Received Amount:** \$37.28M
Despite being a small proportion, bad loans indicate potential risks in certain segments that may require deeper investigation to mitigate.

The segmentation of loan statuses provides insights into approval and repayment pipelines, highlighting bottlenecks and enabling corrective actions.

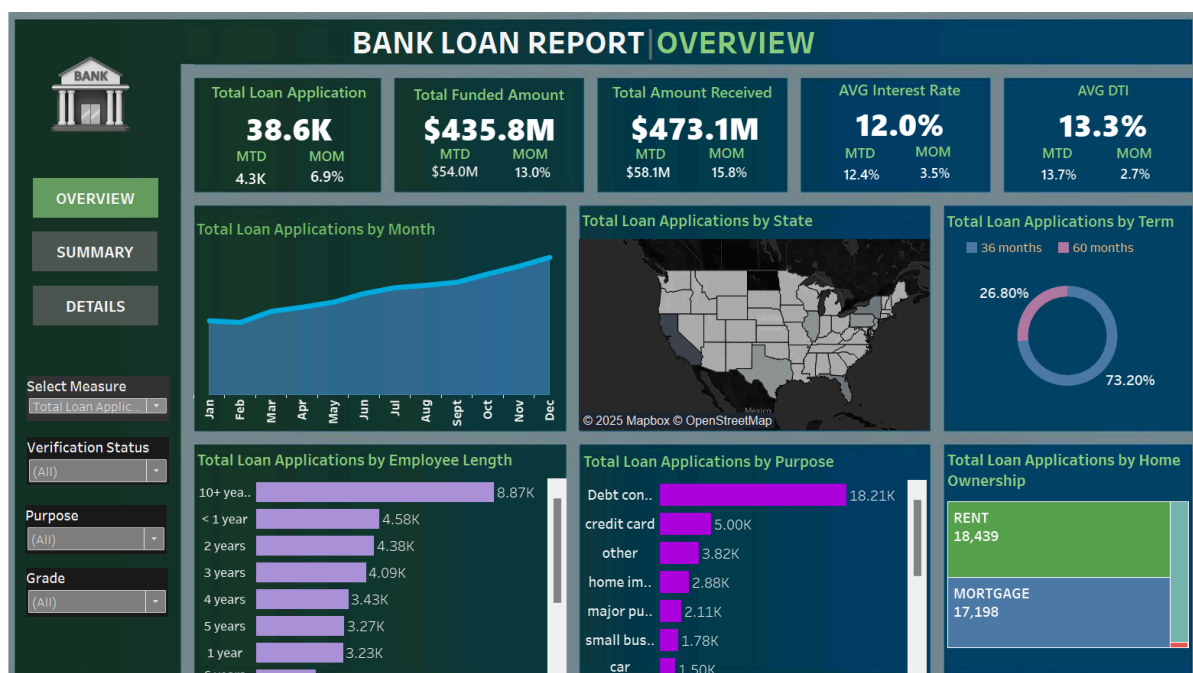
Filters and Navigation

The dashboard includes filters for:

- Verification Status
- Purpose of Loan
- Loan Grade (e.g., High-Risk, Low-Risk,)

These interactive filters enable deeper analysis, making it easier to drill down into specific data segments to uncover trends and patterns based on business needs.

Dashboard 2: Overview Page



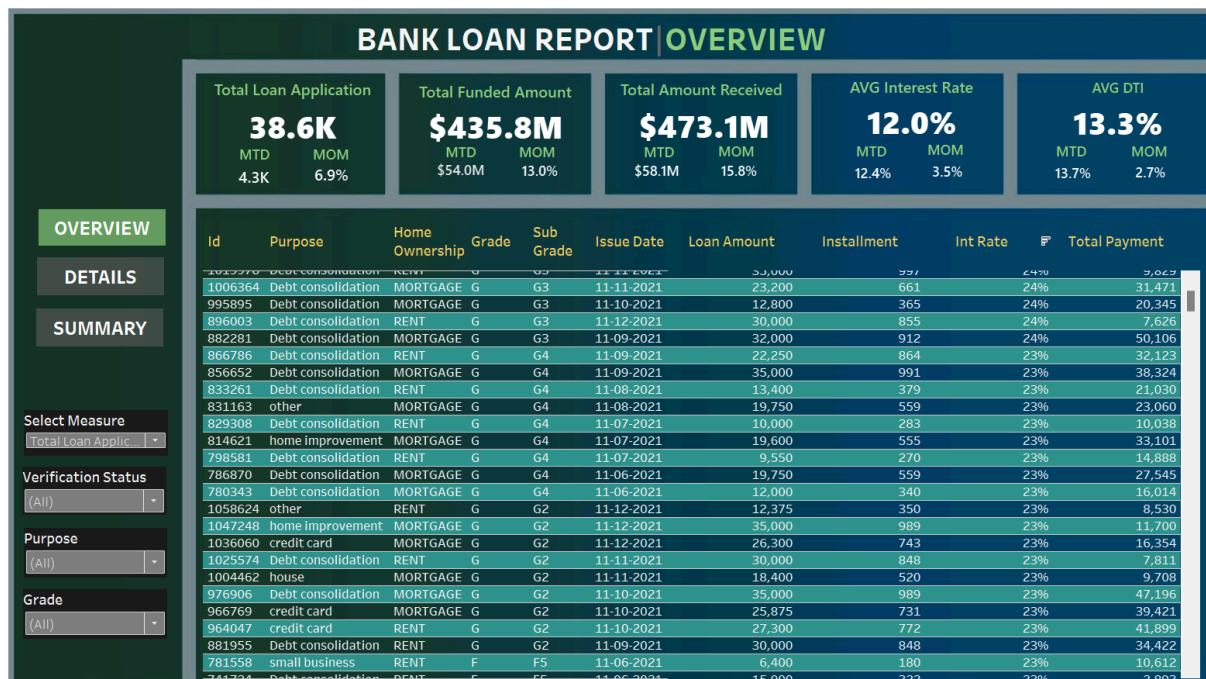
The **Overview Dashboard** provides the same KPIs as the Summary Page for consistency, while featuring key visualizations for deeper analysis:

- **Loan Applications by Month (Trend Chart):** Monitors fluctuations in loan applications, helping to detect seasonal patterns and predict future demand.
 - **Insight:** Spikes in certain months may be due to seasonal factors, marketing campaigns, or economic conditions.
- **Employment Length (Bar Graph):** Shows the distribution of applicants based on their employment tenure, often linked to financial stability.

- **Insight:** Applicants with longer employment tenures repay loans successfully, whereas shorter tenures present higher risk.
- **Loan Purpose (Bar Graph):** Depicts the most common loan purposes (e.g., education, home, car) to help tailor the bank's loan offerings.
 - **Insight:** Understanding which loan purposes dominate helps focus marketing and product development efforts.
- **Homeownership (Tree Map):** Visualizes the relationship between homeownership status and loan types.
 - **Insight:** Homeowners represent lower-risk borrowers due to asset-backed loans, while renters may be higher risk.
- **Loan Term (Donut Chart):** Displays the distribution of loan terms (e.g., 36 months, 60 months).
 - **Insight:** Preference for shorter terms suggests faster repayment cycles, while longer terms may correlate with increased risk.
- **Regional Loan Distribution (Map):** Shows where loans are concentrated geographically, aiding regional managers in identifying trends and opportunities for expansion.

Filters in this dashboard allow users to toggle between total applications, funded amounts, or received amounts, enabling the bank to adjust strategies based on geographic or loan-type insights.

Dashboard 3: Detailed Page



This **Detailed Dashboard** provides granular insights with KPIs consistent with previous dashboards, but focuses on individual loans and borrower profiles. It includes tables and charts that track specific loan details, such as:

- Loan application dates
- Funded amounts

- Repayment dates
- Debt-to-Income (DTI) ratios

Insights by Loan Purpose

- **Debt Consolidation Loans (Highest Volume and Funded Amount)**
 - **Total Applications:** 18,214
 - **Funded Amount:** \$232.46M
 - **Amount Received:** \$253.80M
 - **Insight:** Debt consolidation loans lead in both applications and funded amounts, indicating strong demand for managing high-interest debt.
 - **Recommendation:** Focus marketing efforts on this category, offering attractive terms to capture more customers.
- **Credit Card Loans (Second Highest in Funded Amount)**
 - **Total Applications:** 4,998
 - **Funded Amount:** \$58.89M
 - **Amount Received:** \$65.21M
 - **Insight:** Credit card loans show strong demand, with significant funding and repayment.
 - **Recommendation:** Offer specialized credit card loans tailored to customer needs, like travel or cashback cards.
- **Home Improvement Loans**
 - **Total Applications:** 2,876
 - **Funded Amount:** \$33.35M
 - **Amount Received:** \$36.38M
 - **Insight:** Home improvement loans show steady demand, suggesting customers are willing to invest in home upgrades.
 - **Recommendation:** Partner with home improvement businesses to increase uptake of these loans.
- **Car Loans**
 - **Total Applications:** 1,497
 - **Funded Amount:** \$10.22M
 - **Amount Received:** \$11.32M
 - **Insight:** Car loans show moderate activity, indicating a steady market.
 - **Recommendation:** Offer special promotional rates or partner with car dealerships to increase car loan applications.
- **Small Business Loans**
 - **Total Applications:** 1,776
 - **Funded Amount:** \$24.12M
 - **Amount Received:** \$23.81M
 - **Insight:** Small business loans have steady demand, with entrepreneurs seeking financing for business growth.
 - **Recommendation:** Improve offerings with flexible terms and business consultancy services to attract more small business owners.
- **Wedding Loans**
 - **Total Applications:** 928
 - **Funded Amount:** \$9.23M

- **Amount Received:** \$10.27M
- **Insight:** Wedding loans, though smaller in volume, have strong repayment figures.
- **Recommendation:** Offer personalized wedding loan packages to boost uptake during peak seasons.
- **Medical Loans**
 - **Total Applications:** 667
 - **Funded Amount:** \$5.53M
 - **Amount Received:** \$5.85M
 - **Insight:** Medical loans, though fewer in number, represent a critical financing option for health-related expenses.
 - **Recommendation:** Provide flexible repayment options for medical emergencies or long-term treatments.

Geographical Trends in Loan Applications and Repayments Across U.S. States:

Insight:

- **High Application Volume:** States with larger populations tend to see a higher volume of loan applications. For example, **California (CA)**, **Texas (TX)**, and **New York (NY)** lead in the number of loan applications due to their significant populations and large consumer markets.
- **Repayment Efficiency in Smaller States:** Despite having fewer loan applications, smaller states like **South Dakota (SD)** exhibit higher repayment efficiency. These states may have smaller but more financially stable populations, resulting in better repayment rates relative to the number of loans funded.

California (CA):

- **Applications:** 6,894
- **Amount Funded:** \$78,484,125
- **Amount Received:** \$83,901,234

California leads in loan applications and total funding but may experience a lower repayment efficiency when compared to smaller states due to its higher volume of loans and diverse borrower profiles.

South Dakota (SD):

- **Applications:** 63
- **Amount Funded:** \$606,150
- **Amount Received:** \$656,514

Despite a significantly smaller number of applications, South Dakota shows higher repayment efficiency. The state has a higher repayment amount relative to the funded loans, suggesting that borrowers in this state are more reliable or financially stable.

Key Questions Answered by the Dashboards

What are the most popular loan purposes?

Debt consolidation leads in both volume and funded amount, followed by home improvement and credit card loans.

How do loan grades affect funding and risk?

Lower loan grades (E and F) are associated with higher risk but contribute significantly to funded amounts.

How does employment length affect loan applications and repayments?

Borrowers with longer employment histories (10+ years) tend to repay loans successfully, while those with less than 1 year of employment pose higher risks.

What are the trends in loan terms (36 months vs. 60 months)?

The majority of loans are for 36 months, but there's significant demand for 60-month loans, indicating a preference for flexibility in repayment.

Which loan purpose category has the highest default rate?

Credit card loans and small business loans show the highest default rates, with bad loan proportions more significant in these categories.

What is the total loan application volume by state?

The states with the highest loan applications are CA (6,894), NY (3,701), and FL (2,773), indicating these regions as key contributors to the loan application volume.

Which state contributes the highest total funded amount?

California (CA) stands out with the highest total funded amount of \$78.48 million, followed by New York (NY) at \$42.07 million and Florida (FL) at \$30.05 million.

Which state has the lowest loan applications?

The states with the lowest loan applications are IA (5), NE (5), and IN (9), which indicates a potential area for growth or focus in marketing campaigns.

Which loan purpose has the highest proportion of bad loans by amount?

Credit card loans show the highest proportion of bad loans by amount, with \$65.53M funded in bad loans.

Key Insights from the Data

Loan Purpose Focus

Debt consolidation is the most popular loan purpose and should be the focus of marketing efforts.

Risk Management and Loan Grades

While lower-grade loans bring in more funding, they also come with higher risks. Stricter criteria and higher interest rates can help mitigate these risks.

Employment Length and Loan Repayment

Longer employment history correlates with higher repayment success, suggesting that employment tenure is a key factor in loan approval.

Loan Term Preferences

Shorter loan terms (36 months) are preferred, but flexibility with longer terms (60 months) is also valuable.

Larger States (e.g., CA, TX, NY): High loan applications, but potential for lower repayment efficiency due to a diverse borrower base.

Smaller States (e.g., SD): Higher repayment efficiency despite fewer applications, which may reflect a more financially stable borrower population.

Recommendations Based on Insights

Focus on Debt Consolidation Loans

Targeted campaigns emphasizing debt consolidation can drive higher loan applications.

Strengthen Risk Mitigation for Lower Loan Grades

Implement stricter eligibility criteria, higher interest rates, and collateral requirements for higher-risk loans (Grades E and F).

Leverage Employment Length as a Factor in Loan Approvals

Offer more favorable loan terms for applicants with longer employment histories.

Tailor Loan Offerings Based on Term Preferences

Emphasize the benefits of both 36-month and 60-month loan options to cater to different customer preferences.

These insights can help target marketing strategies and loan servicing approaches, focusing on improving repayment rates in high-application states and leveraging high repayment efficiency in smaller states for more favorable loan offerings.

Tools Used in the Project

SQL Server Management Studio (SSMS):

Used for importing, managing, and querying loan data.

Executed SQL queries to calculate KPIs, validate dashboard metrics, and extract insights.

Tableau

Imported data from SQL Server to create interactive visualizations and dashboards.

Utilized calculated fields for KPIs and created multiple sheets to organize metrics.

Designed three dashboards: Summary, Overview, and Details.