Project Summary: Bank_CustomerSegmentation_RFM_LoanRisk_ProductPerformance_Report

Developed Interactive Report for (**RFM Analysis, Product Performance, Loan Risk, Customer Segmentation**) with 20+ visuals covering **$163B loan portfolio**, product mix, and Loan defaulter rate trends for enhanced decision-making.

Architected a **Star schema model** in Power BI (Fact Loan + 6 dimensions) and imported **1M+ records** from SQL Server to establish a scalable, high-performance data model for loan and customer analytics.

Engineered 15+ advanced DAX measures (ex. RFM Score, Avg Recency, Defaulter Rate, Avg Interest, Outstanding Balance, etc.) and dynamic slicers to enable customer segmentation & risk scoring.

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Data Model

- Star schema with 6 tables:

  - CustomerDim (100 000 customers, demographics, Calculated Column RFM segment)

  - GeographyDim (50 states + Census regions)

  - DateDim (FY 2024 calendar)

  - ProductDim (4 loan products)

  - RiskCategoryDim (High/Med/Low risk)

  - FactLoan (1 000 000 loan transactions, amounts, defaults)

Uncovered high-impact Key Insights

RFM Analysis

Average Monetary Value by RFM Segment

- Champions far outpace all other segments, at $2.01 M average spend, indicating this top tier generates the lion's share of revenue.

- Loyal Customers follow with $1.20 M, showing that retention programs are capturing significant wallet share.

- Potential Loyalists and Needs Attention contribute negligibly ($0.10 M and $0.01 M respectively), highlighting clear upsell and re-engagement opportunities in those cohorts.

Customer Distribution by RFM Segment (Pie)

- Champions comprise 54.16% (54 K customers) of the base.

- Loyal Customers are 45.65% (46 K).

- Potential Loyalists and Needs Attention together account for only 0.18%, underscoring that nearly the entire customer base is already highly engaged.

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Detailed Customer Table with Conditional Formatting

- Top Champions span with annual incomes from $36.8 K to $89.8 K.

- All shown customers have ideal Recency and high Frequency (11 transactions), confirming the uniformity of engagement metrics in the Champion bucket.

- Geographic spread (e.g., Minnesota, Iowa, Wisconsin, New Hampshire) signals broad regional penetration among highest-value clients.

Customer Segmentation

Marital Status

- Married customers lead at 26 K, followed by Single at 21 K, and Divorced slightly lower— suggesting that family-oriented banking products may resonate most strongly.

Gender

- Female customers number 24 K vs. Male at 19 K, indicating a modest female skew that could inform targeted marketing.

Job Classification

- White-Collar dominates at 50.2% (~ 50 K), with Blue-Collar at 29.77% and Other at 20.03%— highlighting that professional income brackets form the core client base.

Geographic Segmentation (Map)

- The U.S. map clearly shows Champions and Loyal customers clustered in the Midwest and Northeast, with sparser representation in the West and South, pointing to region-specific growth opportunities.

Income Segment by Age Group

- Seniors have the highest High-Income count (20 K) but still maintain a non-trivial Medium (13 K) and Low (8 K) cohort.

- Adults show smaller populations across all income bands (High 9 K, Medium 6 K, Low 3 K).

- Young customers surprisingly mirror Seniors in the High-Income band (21 K), suggesting a well-off younger demographic worth targeting with premium digital products.

Loan Risk Analysis

Regional Defaulter Rate

- Bars for Midwest, Northeast, South, and West cluster tightly around 7.3%–7.6% default.

- The West edge slightly higher, signalling a marginally elevated risk environment there.

Defaulter Rate Over Time (Line)

- Default rates fluctuate between 7.27% (Feb) and 7.64% (Aug), but overall remain remarkably stable around 7.5% throughout the year.

Defaulter % by Credit-Score Segment

- High-Risk borrowers' default at 7.66%, compared to 7.54% for Medium-Risk and 7.45% for Low-Risk.

- Narrow spread suggests credit-score band alone is a weak predictor of default in this portfolio.

Default vs. Non-Default by Product (Stacked Bar)

- Home Loans dominate with 463 K issued; default rate 7.50%, high-risk loans just 2.29% of that.

- Auto and Personal Loans each 185 K, Education 92 K—all showing similar 7.5% default rates.

- Uniform default performance across products suggests systemic factors driving risk more than product type.

Product Performance Analysis

Total Loan Amount by Product

- Home Loans: $150 B (vast majority).

- Auto: $6 B, Education: $5 B, Personal: $2 B—reinforcing mortgage-centric balance sheet.

Average Interest & Loan Amount Over Time (Dual-Line)

- Avg Loan Amount holds steady around $163 K–$165 K.

- Avg Interest Rate edges up from 5.33% (Sep) to 5.36% (Jan), then oscillates—indicating modest rate volatility but steady loan sizing.

Outstanding Balance by Product

- Home: $5.6 B, Auto & Education each $200 M, Personal $100 M.

- Outstanding exposure mirrors origination volumes, confirming consistent amortization behaviour across product lines.

Share of Loan Count by Product (Donut)

- Home Loans represent 50.02% of all accounts, auto 20.01%, Personal 19.96%, Education 10.02%.

- Mortgage products not only dominate in dollar terms but also account for half of all loans issued.

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Key KPI Cards

- Avg Loan Amount: $163 K

- Avg Interest Rate: 5.35%

- Total Loans Issued: 1 M

- Avg Credit Score: 700

- Avg Term: 36 months

- These succinct cards provide at-a-glance tracking of portfolio health and risk metrics.

End of Report Thanks