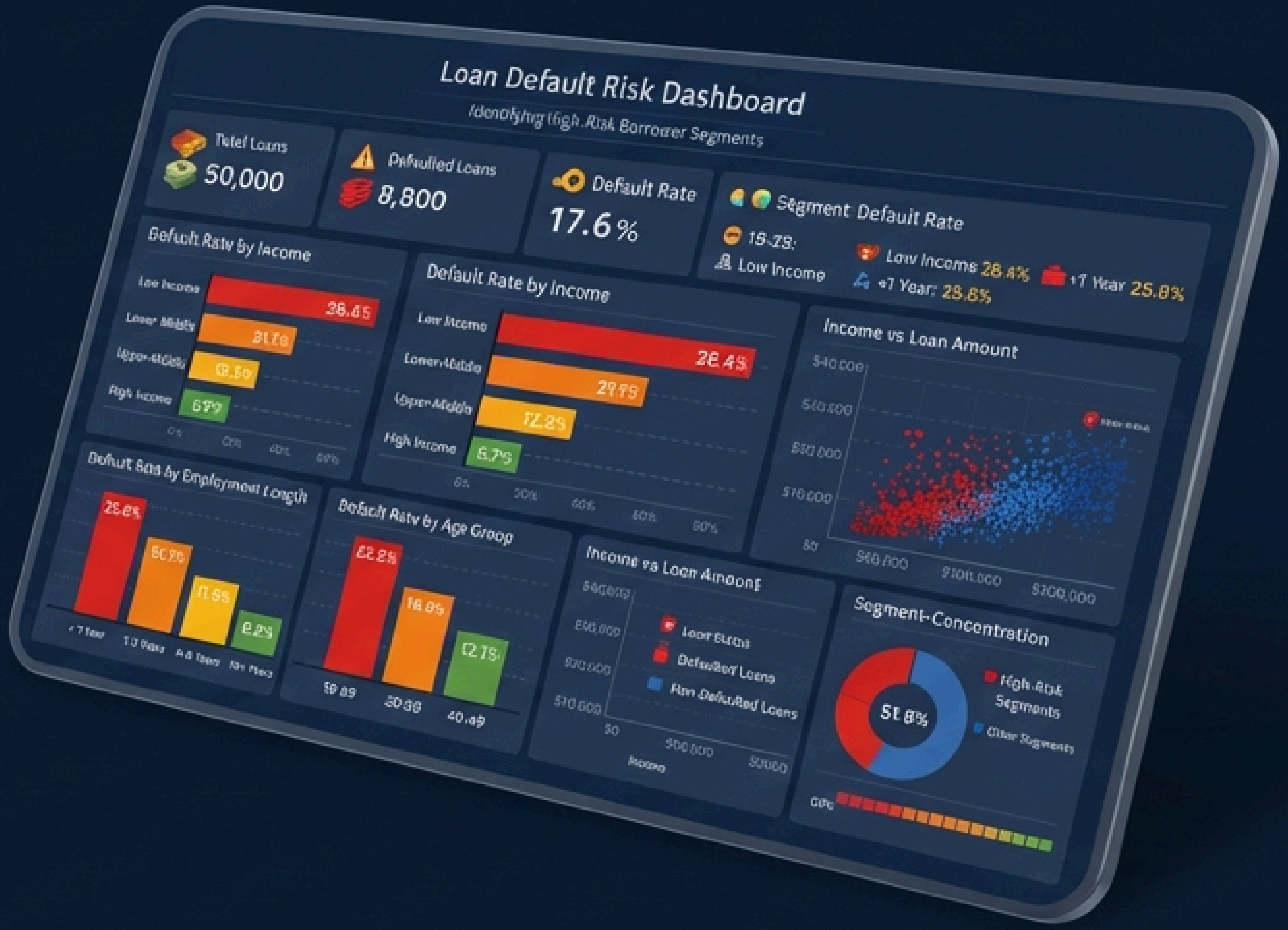
Optimizing Lending Decisions Through Data-Driven Risk Segmentation

A Loan Default Risk Analysis Dashboard for the Banking & Finance Sector.

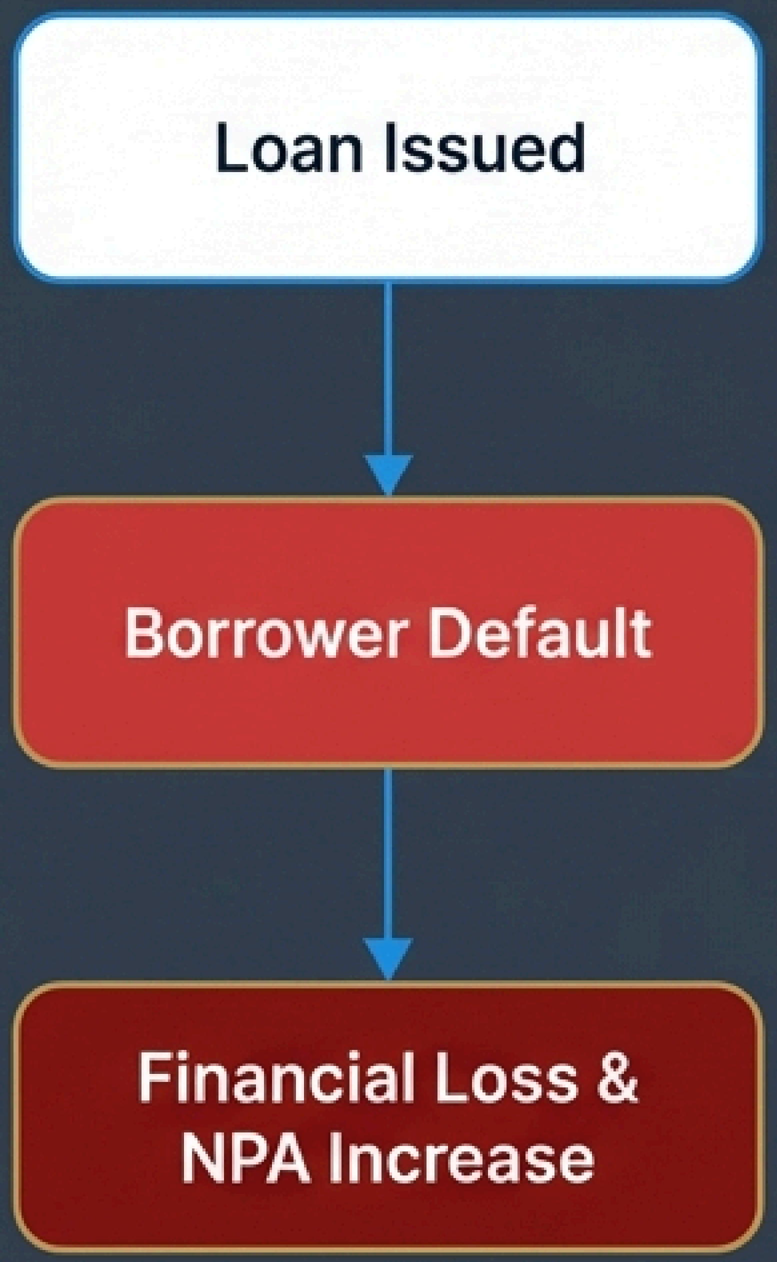


Project Title: Loan Default Risk Analysis Dashboard

Context: Banking & Finance Sector

Team: Team ID / Newton School of Technology / Faculty Mentor

Defaults Erode Profitabiliity and Increase Non-Performing Assets



The Context:

Lending is the primary revenue engine for banks, but it carries inherent risk. When borrowers fail to repay, it leads to direct financial loss and reduced portfolio stabiiity.

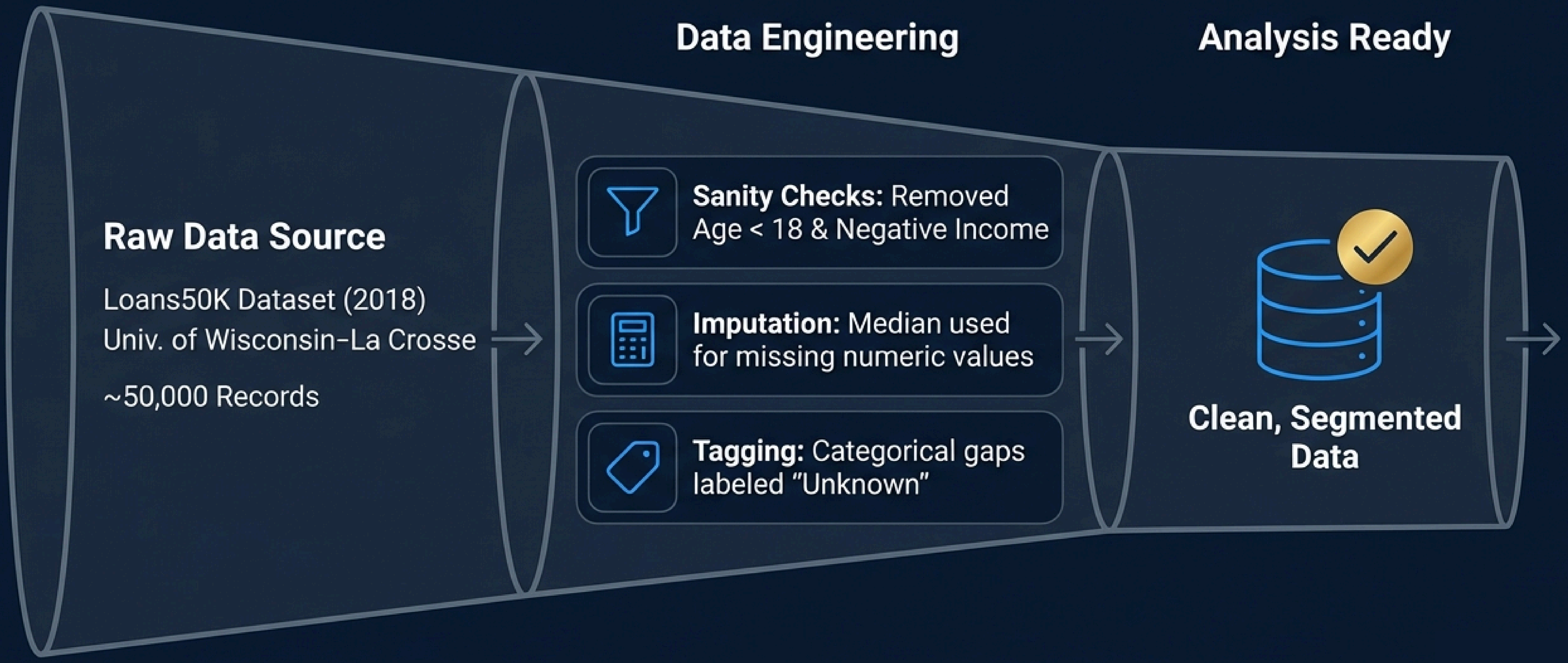
The Problem Statement:

Which customer segments are most likely to default on loans, and how can lending decisions be optimized to reduce credit risk?

The Objective:

To replace intuition with data-driven segmentation that identifies high-risk profiles without stalling business growth.

Ensuring Integrity: Refining the Loans50K Dataset



A KPI Framework for Measuring Portfolio Health

Primary Metric:
Overall Default Rate (%)

High-Risk Segment Contribution (%)

Identifying groups driving losses

Average DTI Gap

Defaulter vs. Non-Defaulter Financial Stress

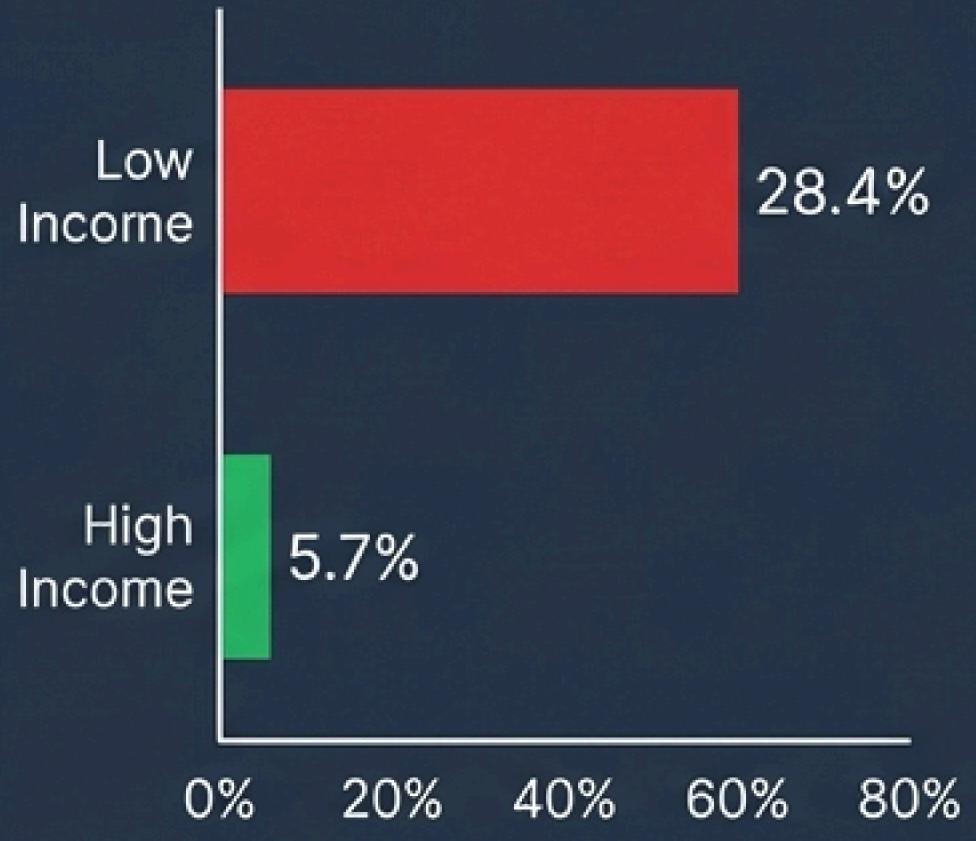
Credit Utilization Risk

Revolving credit usage behavior

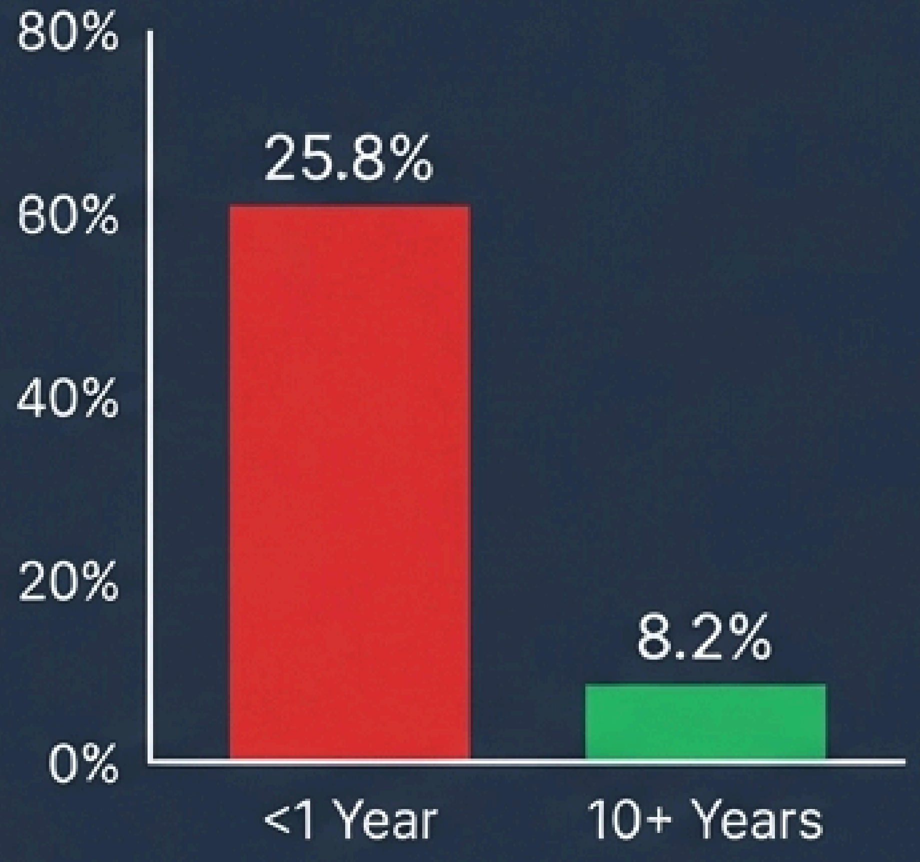
Rationale: These metrics link borrower financial health directly to business outcomes.

Income, Tenure, and Exposure Drive Default Probability

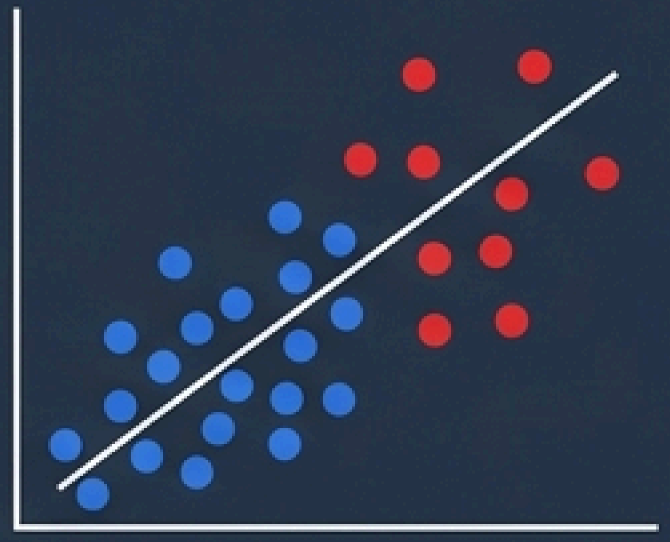
Income Impact



Employment Stability



Loan Exposure

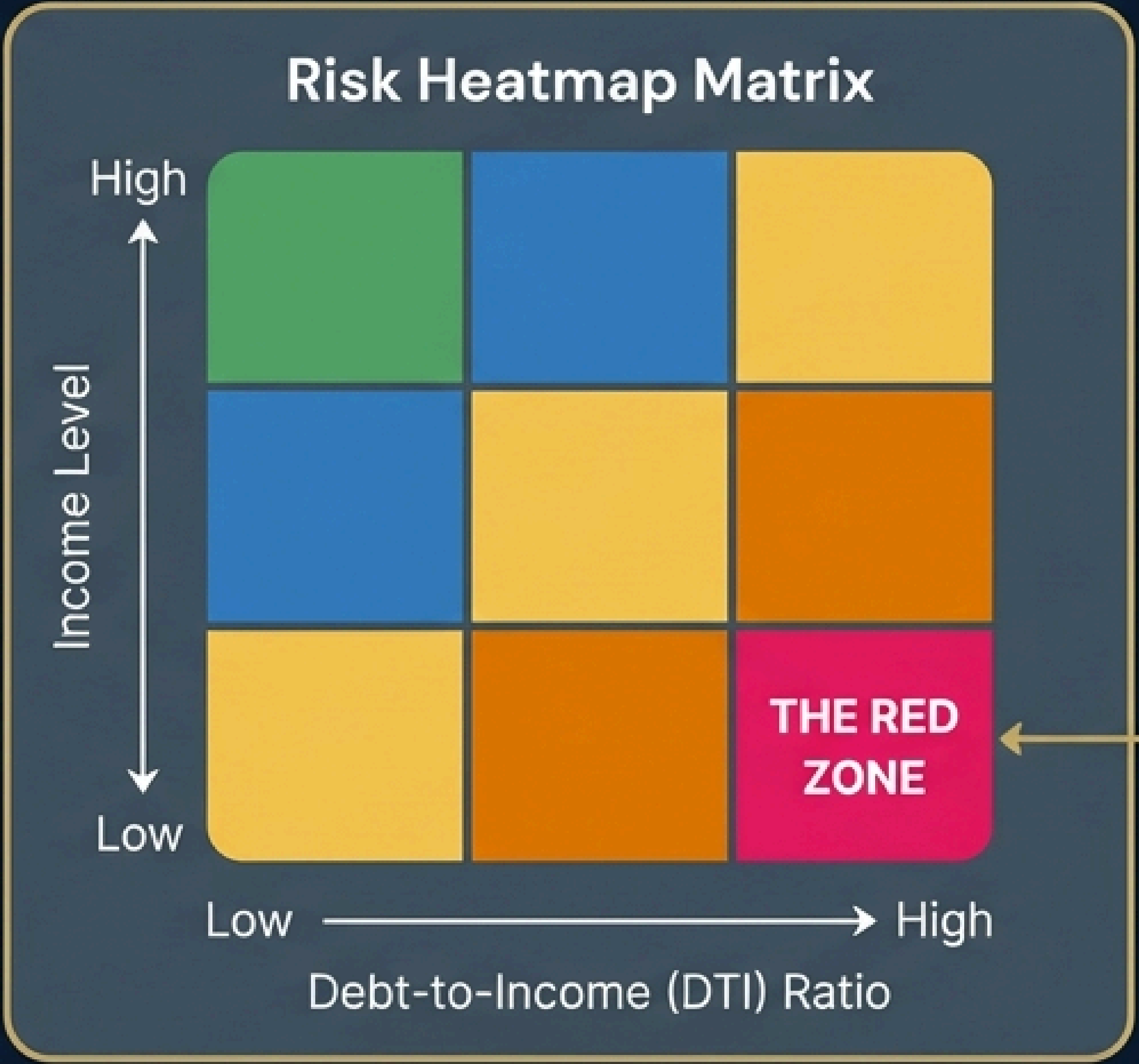


Higher Loan Amounts correlate with higher default probability.

Insights: Financial instability (Low Income) and lack of tenure (<1 Year) are the strongest predictors of default.

Institutional Fintech Premium

Identifying the ‘Red Zone’ of Compounded Risk



Intersection of Low Income & High DTI creates the highest probability of default. Risk is compounded, not linear.

Business Implication: Approval thresholds must adjust dynamically based on this matrix.

The Solution: Loan Default Risk Analysis Dashboard

Executive Ribbon: Instant view of 17.6% Default Rate & 50k Loans

Segmentation View: Drill-down by Income, Age, and Employment

Dynamic Slicers: Filter by Grade and Term

Strategic Recommendations for Risk Mitigation

Risk-Based Pricing

Implement dynamic interest rate increases for “Red Zone” segments (Low Income/High DTI).

Threshold Adjustment

Inter: Tighten approval criteria for applicants with <2 years employment history.

Exposure Management

Inter: Cap maximum loan amounts for high-risk profiles to limit capital loss severity.

Bridge Products

Inter: Offer smaller, short-term loans to risky customers to build credit history safely.

Driving Profitability Through Portfolio Stability

2–3%

Projected Reduction in Default Rate

- **Capital Retention:** Direct increase in bottom-line profitability.
- **Portfolio Stability:** Reduced volatility in Non-Performing Assets (NPAs).
- **Operational Efficiency:** Less time and resource allocation to debt collection.
- **Competitive Edge:** Ability to price risk accurately rather than rejecting all applicants.

Limitations & Future Roadmap

Current

Static Analysis

Based on 2018 historical data. Lacks real-time credit bureau integration.

Next Phase

Live Integration

Integrate API data feeds for up-to-the-minute credit scoring and inflation adjustment.

Future Vision

Predictive AI

Deploy Machine Learning (Random Forest) models to automate approval confidence scores.