AI-Driven Credit Solvency Engine

Automating Lending Decisions to Maximize Revenue and Minimize Default Risk

Maximize Revenue Minimize Risk AI-Driven

The Business Problem

Traditional manual lending processes create financial leaks through inefficiency and human error.

Operational Friction

Manual reviews of applications create high costs and slow "time-to-decision" for thousands of cases.

High Processing Costs
Slow Decision Times

Capital Risk (Type II Error)

Approving "bad" loans leads to expensive defaults that strain capital reserves.

Bad Loan Defaults
Capital Losses

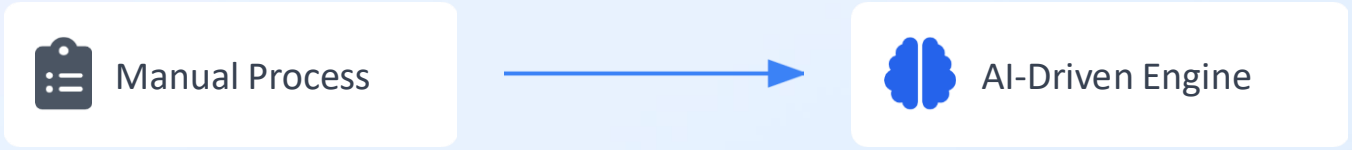
Opportunity Loss (Type I Error)

Rejecting creditworthy customers due to rigid scoring results in lost interest revenue.

Lost Revenue
Competitive Disadvantage

Our Approach

Transitioning from "manual checklists" to an Intelligent Decision Engine.



Data Integration

Consolidated 20,000 customer profiles, analyzing demographics and credit behavior.

20,000 Profiles
Multi-Dimensional Analysis

Pattern Recognition

Identifies complex relationships between financial health and repayment probability.

Complex Patterns
Hidden Insights

Automated Scaling

Instant, data-driven recommendations, focusing only on complex cases.

Real-Time Decisions
Human Focus on Complex Cases

Key Findings - Solvency Sweet Spot

We identified specific Debt-to-Income (DTI) thresholds where default risk **spikes exponentially**, allowing us to set safer hard-limits.

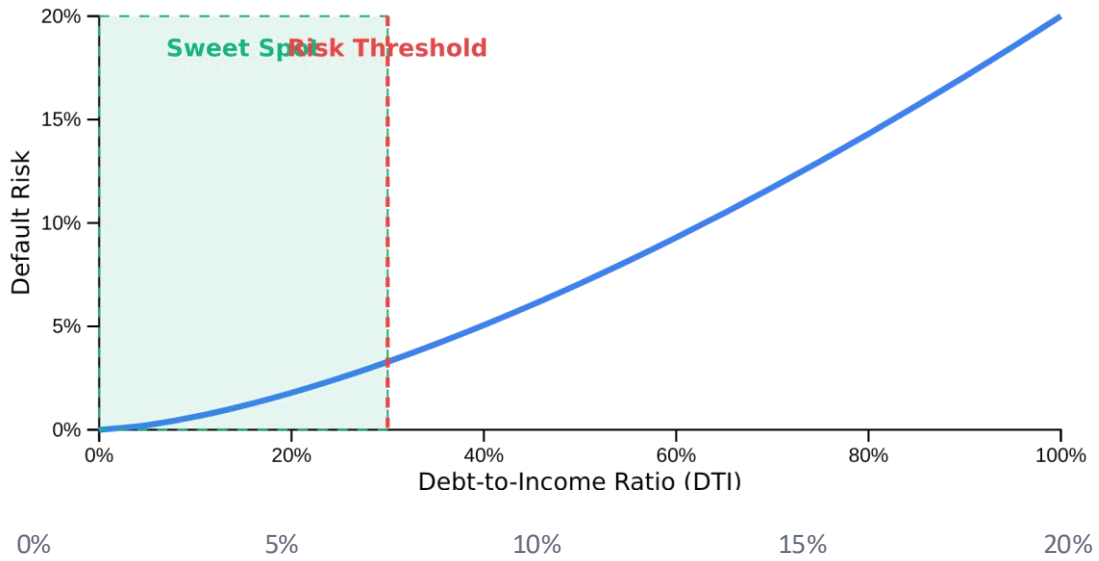
The "Solvency Sweet Spot"

- Identified optimal DTI ranges where borrowers maintain stable financial health
- Discovered exponential risk increase beyond certain thresholds

Business Impact

- Set precise DTI hard-limits to maintain low-risk lending
- Automate decisions for applicants within safe DTI ranges

DTI Risk Profile



0% 5% 10% 15% 20%

Key Insight: The exponential increase in default risk beyond certain DTI thresholds enables precise risk segmentation.

Key Findings - Risk Score Dominance

Our analysis revealed that a composite Risk Score is **10x more powerful** than demographics at predicting loan repayment.

Predictive Power Comparison

Risk Score **10x**

Age **1x**

Education Level **1x**

**Based on model performance in predicting loan repayment*

Untapped Customer Segment

98%

Repayment Probability

The "Low Credit Score, High Net-Worth" Segment:

- Currently rejected by traditional scoring
- High repayment probability
- Significant revenue opportunity

Results - Business Value

By deploying the XGBoost Decision Model, we achieved significant improvements in decision accuracy and business outcomes.

98% Accuracy

Near-perfect identification of safe borrowers, minimizing false positives.

98% Recall

Capturing almost the entire available "safe" market, leaving minimal revenue on the table.

98% Precision

Filtering out high-risk profiles significantly reduces capital set aside for bad debt.

Business Impact

The model has significantly improved our risk assessment while capturing a broader base of creditworthy customers, leading to increased revenue and reduced losses.

Strategic Recommendations

Key actions to maximize the benefits of our AI-driven credit solvency engine.

Phased Automation

Implement "Auto-Approval" for applicants in the top 20% of the Risk Score bracket.

- Reduce operational overhead
- Focus human analysts on complex cases

Implementation: Month 3

Dynamic Pricing

Use the model's probability scores to offer lower interest rates to ultra-low-risk clients.

- Outcompete other banks for premium business
- Create competitive advantage

Implementation: Ongoing

Standardize Data Collection

Incentivize applicants to provide "Net Worth" data, a key driver for loan success.

- Improve model accuracy
- Enhance risk assessment

Implementation: Pilot Program

Risks & Considerations

Key factors to maintain engine effectiveness.

Model "Drift"

Economic shifts could change borrower behavior, requiring quarterly "re-tuning" to stay accurate.

Requires quarterly model updates

Regulatory Compliance

Ensure "Risk Score" logic remains transparent to comply with fair lending laws.

Regular compliance audits

Data Quality

Engine is only as good as the data it receives; "Garbage In, Garbage Out" remains a risk.

Data verification processes

Continuous Monitoring Required

Implement ongoing evaluation to maintain model accuracy.

Model Accuracy	Data Quality
98%	95%

Next Steps & Timeline

Implementation plan for the AI-Driven Credit Solvency Engine.

Month 1: Pilot Phase

Shadow Decision Maker

- Run engine in parallel with human analysts
- Compare decisions and accuracy

Objective:
Validate model accuracy with real-world data

Month 3: Automation

Full Automation

- Automate "Low-Risk" segment approvals
- Human review for "Medium-Risk" cases

Objective:
Scale AI decisions across 20,000 customer profiles

ROI Projection

Quantifying the business impact of AI-Driven Credit Solvency Engine.

25% Reduction

In operational costs

15% Increase

In loan yield

$2M - $5M

Annual impact per $100M in originations

Projected ROI Breakdown