Predicting Delinquency in Financial Services

A Strategic Approach to Minimizing Risk and Enhancing Customer Retention

1. Summary of Predictive Insights

Based on exploratory data analysis (EDA) and predictive modeling, the following key insights were identified regarding customer delinquency risk:

Top 3 Risk Factors for Delinquency

- **Missed Payments (Past 6 Months):** Customers with 3+ missed payments in the last six months show significantly higher delinquency risk.
- **High Credit Utilization (>50%):** Customers using more than half of their available credit are 2.5x more likely to become delinquent.
- **Low Credit Score (<500):** Individuals with lower credit scores exhibit a higher propensity for missed payments and delinquency.

High-Risk Customer Segments

- **Younger Customers (Age <30):** Often have limited credit history and higher credit utilization.
- **Unemployed/Self-Employed Individuals:** Income instability correlates with payment inconsistencies.
- **Customers with Short Account Tenure (<1 Year):** Newer account holders may lack established repayment behavior.

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2. Recommendation Framework

SMART Recommendation

"Reduce delinquency risk by implementing a proactive credit limit adjustment policy for customers with credit utilization above 50%, coupled with financial counseling for high-risk segments."

Rationale:

- **Specific:** Targets high-utilization customers, a key predictor of delinquency.
- **Measurable:** Success can be tracked via reduced delinquency rates in this segment.
- **Achievable:** Uses existing credit risk data without major operational changes.
- **Relevant:** Aligns with Geldium's goal of minimizing bad debt.
- **Time-bound:** Pilot program to be reviewed after 6 months.

Stakeholder Explanation:
"By proactively adjusting credit limits for high-utilization customers and offering financial guidance, we can reduce their risk of delinquency while maintaining customer relationships. This approach balances risk mitigation with customer retention."

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3. Ethical and Responsible AI Considerations

Fairness Risks & Mitigation Strategies

Risk	Mitigation Strategy
Age Bias: Younger customers may be unfairly flagged due to limited credit history.	Ensure model accounts for alternative data (e.g., income stability, employment status) to avoid over-penalizing younger applicants.
Income Disparity: Lower-income individuals may face higher false-positive risk.	Implement dynamic thresholds for risk scoring, adjusting for income levels to ensure fairness.

Explainability for Non-Technical Stakeholders

- **"The model predicts delinquency risk by analyzing past payment behavior, credit usage, and financial stability—similar to how a loan officer assesses risk, but with greater consistency."**
- **Transparency:** Provide clear documentation on model logic and allow manual review for borderline cases.

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4. Conclusion & Next Steps

This report highlights key delinquency risk factors and proposes a targeted, ethical intervention to reduce defaults. Next steps include:

1. **Pilot the credit limit adjustment program** with a select high-risk group.
2. **Monitor impact** over 6 months before full-scale implementation.
3. **Review model fairness** quarterly to ensure unbiased outcomes.

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