Business Summary Report: Predictive Insights for Collections Strategy

1. Summary of Predictive Insights

Our predictive model identifies customer segments most likely to become delinquent and highlights key risk factors driving that outcome. Key findings from our analysis:

- **High-risk segments** include customers who are *new to credit (low account tenure)*, *unemployed/self-employed*, or located in *Los Angeles* and *Houston*.
- The most predictive features for delinquency are:
    - **Missed and late payments** in the past 6 months
    - **High credit utilization** (above 70%)
    - **High debt-to-income ratio** (above 0.4)
    - **Inconsistent payment patterns** (frequent shifts between on-time, late, and missed)
- These insights align with operational data: customers with poor payment consistency and high financial strain show elevated delinquency risks.

Key Insights Summary Table

Key Insight	Customer Segment	Influencing Variables	Potential Impact
Low tenure + inconsistent payment = high risk	New customers (<12 months)	Account Tenure, Payment History	Prioritize early intervention outreach
High credit utilization increases risk	Across all income groups	Credit Utilization, Debt-to-Income Ratio	Trigger financial education prompts or counseling offers
Employment type influences delinquency	Unemployed, Self-employed	Employment Status, Loan Balance, Income	Tailor credit limits and repayment plans by group

2. Recommendation Framework

Restated Insight:

Customers with low account tenure and high credit utilization are significantly more likely to default.

Proposed Recommendation:

Launch a **targeted early intervention program** for new and high-utilization customers to provide support before delinquency occurs.

- **Specific:**
  Identify customers with <12 months of credit history and credit utilization above 70%, and enroll them into a payment support and education program.
- **Measurable:**
  Reduce delinquency in this group by **20%** over the next **6 months**.
- **Actionable:**
  Use the trained AI model to flag at-risk accounts weekly and trigger automated outreach via SMS, app alerts, and customer support.
- **Relevant:**
  Aligns with Geldium's goals to proactively reduce collection costs and improve repayment rates through strategic intervention.
- **Time-bound:**
  Pilot the program in **Q3**, evaluate performance by **Q4**, and scale if success thresholds are met.

Justification and Business Rationale:

By addressing risk **before delinquency occurs**, Geldium can significantly reduce downstream collection expenses, improve customer satisfaction, and ensure sustainable repayments. The approach is data-driven, targeted, and cost-efficient.

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3. Ethical and Responsible AI Considerations

Fairness and Bias

- The initial model showed a **Demographic Parity Δ of 0.237**, indicating **selection rate imbalance** across employment groups (e.g., Unemployed vs. Employed).
- **Mitigation:** Applied post-processing with **Fairlearn** using Equalized Odds, which reduced the fairness gap and ensured more equitable outcomes across sensitive features.

Explainability

- The model's predictions are **based on clear behavioral signals** (payment history, credit use), which are **easily explainable** to both internal stakeholders and customers.

Responsible Use

- The recommendation promotes **supportive financial engagement**, not punitive action.
- At-risk customers are **offered help—not denied service**, fostering **trust and transparency** in collections processes.

Additional Principles

- **Transparency:** Decision rules and risk flags are shared with support agents.
- **Accountability:** Regular audits of prediction outcomes are recommended to maintain fairness and integrity.
- **Data Privacy:** All model inputs follow standard privacy protocols and avoid sensitive personal information.