AI-Powered Collections Strategy

Leveraging Agentic AI for Scalable, Fair, and Effective Debt Management at Geldium

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How the System Works

1. Inputs (Data Ingestion)
- **Static Data:** Demographics, Income (with median imputation applied).
- **Dynamic Data:** Real-time **Credit Utilization** (our #1 predictor), Payment History, and Recent Transaction Volume.
- **Interaction Data:** Email open rates, SMS response times, past call outcomes.

2. Decision Logic (The "Brain")
- **Predictive Layer:** The **Random Forest Model** calculates a daily "Delinquency Probability Score."
- **Agentic Layer:** The AI assesses the context.
  -Example: "Customer Risk > 50% due to Utilization spike + No missing payments before? Trigger 'Soft Nudge' strategy."

3. Actions (The "Hands")
- **Low Friction:** Automated SMS/Email reminders with self-service payment links.
- **Education:** Sending financial wellness tips (e.g., "How to lower your DTI").
- **Escalation:** Queuing the customer for a human call if digital outreach fails after 3 attempts.

4. Learning Loop (The "Memory")
- **Outcome Monitoring:** Did the SMS sent at 6 PM get a better response than the one at 9 AM?
- **Model Retraining:** The system feeds successful intervention data back into the Random Forest model to improve future accuracy.

Role of Agentic AI

Autonomous AI (The Agent)	Human Oversight (The Manager)
Real-time Risk Scoring: Instantly flagging customers when Utilization crosses 50%.	**Complex Hardship Requests:** Reviewing cases where customers declare bankruptcy or severe medical distress.
Channel Optimization: Deciding whether to send an SMS, Email, or Push Notification based on customer preference.	**Adverse Actions:** Final approval before reducing a credit limit or closing an account to ensure fairness.
Content Personalization: Selecting the right "Tone" (e.g., Supportive vs. Urgent) based on risk level.	**Model Auditing:** Monthly review of the "Learning Loop" to ensure the AI isn't developing new biases.

Responsible AI Guardrails

1. Fairness Circuit Breakers:

- **The Issue:** We know Income data is often missing.
- **The Guardrail:** The system will automatically pause if it detects a disproportionate number of interventions targeting specific low-income zip codes, triggering a human review for **Socioeconomic Bias**.

2. Explainability (The "Why"):

- Every automated action must have a logged reason code derived from the Random Forest Feature Importance (e.g., "Action taken because *Debt-to-Income Ratio* exceeded threshold," not just "High Risk Score").

3. Regulatory Compliance (ECOA & GDPR):

- The system acts as a "Glass Box." Customers have the right to ask *why* they were contacted, and the system can generate a plain-language explanation of the decision factors.

4. Proportionality Check:

- The AI is restricted from taking aggressive actions (like reporting to bureaus) on customers with High Credit Scores who have only 1 missed payment (addressing the "Good Score Anomaly" we found).

Expected Business Impact

1. Quantitative Outcomes (The Numbers)

- **Reduce Early Delinquency:** Target a **10% reduction** in 30-day delinquency within the first quarter by catching "High Utilization" spikes early.
- **Operational Efficiency:** Reduce manual call volume by **25%** by automating low-risk outreach (SMS/Email), freeing up agents for complex cases.

Improve Recovery Rate: Increase successful collections by optimizing the *timing* of outreach (Agentic AI sending messages when customers are most likely to pay).

2. Qualitative Outcomes (The Value)

- **Enhanced Customer Experience:** Moving from "Harassment" to "Help." Customers receive helpful nudges rather than angry calls.
- **Scalability:** The system can handle 10,000 or 10 million customers without adding headcount.
- **Fairness & Consistency:** Removes human mood/bias from the equation; every customer is treated based on data, not an agent's gut feeling.