

CloudWalk Technical Case – Transactional Analysis

Data Analyst - Risk Analyst I

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1. Data Analysis & Key Findings

After examining the transactional dataset in Power BI dashboard (Total Transactions = 3199; Chargeback Rate = 12%; Unique Users = 2704; Unique Devices = 1997), I found suspicious behaviors:

- **High-Risk Users & Devices**
 - The top 5 users account for disproportionately high chargeback rates (81%–93%), despite being a small fraction of total transactions.
 - Similarly, a handful of devices show both elevated chargeback counts and rates (up to 93%).
 - **Conclusion:** Repeated disputes on the same user accounts or devices suggest credential-sharing, friendly fraud, or compromised credentials.
 - **Action:** Place these user_id/device_id pairs into a manual-review queue and enforce stricter verification (e.g., step-up authentication).
- **Amount-Based “Test-and-Hit” Patterns**
 - Chargeback frequency peaks in low-value bins (R\$0–100 and R\$100–200), then drops sharply, then briefly resurges at mid/high values, consistent with “test small amount → validate stolen card → commit larger fraud”.
 - **Action:** Implement dynamic amount-based velocity rules, declining or challenging multiple small transactions followed by large ones on the same device.
- **Temporal Clustering**
 - Chargebacks cluster in off-peak hours, showing automated or scripted fraud tries when human review may be slowest.
 - **Action:** Increase real-time monitoring and enforce lower risk thresholds during this time windows (e.g., require 3D Secure at 2 a.m.) (Stripe, 2025).

2. Additional Data to Enhance Fraud Detection

To uncover deeper fraud patterns, I recommend integrating:

- **Device & Network Metadata:** IP geolocation, VPN/proxy flags, browser-fingerprint scores, and device fingerprinting.
- **Customer Profile & Historical Trends:** Lifetime chargeback history, average order value per user, and account age.
- **Order Fulfillment Data:** Shipping address velocity (same address used by multiple cards), carrier GPS-stamps, and proof-of-delivery images.

- **External Fraud Feeds:** BIN risk scores, global fraud deny lists, and peer network alerts from other merchants.
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3. Fraud & Chargeback Prevention Recommendations

Building on these insights, I suggest:

1. Hybrid Rule-and-ML Engine

- **Rule Module:** Enforce velocity/amount rules and time-window restrictions (e.g., max 2 small transactions/hour on same device) (Worldline, 2025).
- **ML Module:** Train a supervised model on enriched features (device risk score, user history, amount bin) to output a dynamic risk score.

2. Step-Up Authentication

- Trigger 3D Secure or OTP verification for medium-risk transactions (e.g., new device, high-value purchase, or off-hour order).

3. Manual Review & Rapid Response

- Automatically route transactions above a specified risk threshold to a specialized team for the same day review (SEON Technologies Ltd., 2021).

4. Continuous Monitoring & Feedback Loop

- Collect outcome data from disputes and chargeback representments to retrain the ML model and tune rule parameters, ensuring the system adapts to emerging fraud tactics.

References

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