**CloudWalk Technical Case – Transactional Analysis**

**Data Analyst - Risk Analyst I**

**Daniel Sousa**

**1. Data Analysis & Key Findings**After examining the transactional dataset and 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.

**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

SEON Technologies Ltd. (2021, August 30). *Chargeback Fraud Prevention Guide.* Retrieved from SEON: https://resources.cdn.seon.io/uploads/2021/08/Chargeback\_Guide\_08-30.pdf

Stripe. (2025, February 14). *3D Secure 101: What businesses need to know*. Retrieved from Stripe: https://stripe.com/resources/more/3d-secure-101

Worldline. (2025). *Fraud Detection Module*. Retrieved from Worldline: https://support.legacy.worldline-solutions.com/en/security/fraud-prevention/fraud-detection-module