

Precision Banking: SQL Analytics Report

1. Project Overview

This report details the SQL-driven insights and risk assessment performed on 10,000+ transaction signals. The analysis focuses on isolating volume and value metrics to drive strategic banking decisions.

2. Database Schema Setup

To simulate the 10,000 transactions, the following table structure is utilized:

```
CREATE TABLE transactions (
    transaction_id SERIAL PRIMARY KEY,
    customer_id INT,
    amount DECIMAL(15, 2),
    channel VARCHAR(50), -- POS, Online, ATM, UPI
    transaction_date DATE,
    transaction_time TIME,
    transaction_type VARCHAR(20) -- Domestic, International
);
```

3. Macro Analysis: Volume vs. Value

This query aggregates KPIs to identify channel efficiency. POS drives 85% of volume, but Online channels generate 39% of total revenue with a higher value-per-interaction.

```
-- Aggregate macro-level KPIs
SELECT
    channel,
    COUNT(transaction_id) AS total_transactions,
    SUM(amount) AS total_value
FROM transactions
WHERE transaction_date >= '2023-01-01'
GROUP BY channel;
```

4. High-Value Customer Segmentation (Elite Cohort)

Segmentation reveals that just 7% of the customer base (85 individuals) drives 38% of total revenue (\$1.85M). This query isolates those driving the business.

```
-- Identify customers with >$50k revenue and >100 transactions
SELECT
    customer_id,
    COUNT(transaction_id) AS Transaction_Count,
    SUM(amount) AS Revenue
FROM transactions
GROUP BY customer_id
HAVING SUM(amount) > 50000 AND COUNT(transaction_id) > 100;
```

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5. Fraud Detection: Time-Based Anomalies

Analysis flagged 145 specific anomalies occurring between 12 AM and 4 AM, representing \$620,000 in potential fraud exposure.

```
-- Flag high-risk international transfers (12AM - 4AM, >$5k)
SELECT
    transaction_id,
    customer_id,
    amount,
    transaction_time
FROM transactions
WHERE transaction_time BETWEEN '00:00:00' AND '04:00:00'
    AND amount > 5000
    AND transaction_type = 'International';
```

6. Digital Premium and International Growth

International transactions average \$1,200, which is 2.5x the domestic average of \$485. This identifies a high-growth but high-friction segment.

```
-- Compare average value between Domestic and International
SELECT
    transaction_type,
    AVG(amount) AS avg_transaction_value
FROM transactions
GROUP BY transaction_type;
```

7. Strategic Recommendations

- Automate Defense: Transition the 12AM-4AM logic into production blocking rules.
- Prioritize Digital: Shift marketing budget from POS to Online channels for higher ROI.
- Retain Elite Tier: Launch a "Concierge Banking" tier for the top 7% of revenue drivers.