TRANSACTION RECONCILIATION AND SYSTEM INTEGRITY REPORT

A SQL DATA ANALYSIS

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PROJECT SUMMARY

This project focuses on reconciling transaction data to evaluate the effectiveness of system controls and data integrity measures across systems. By identifying discrepancies, missing transactions, and processing errors, the report highlights recommendations for strengthening reconciliation and mitigating financial risk that ensure end-to-end system integrity, data accuracy, and operational reliability.

OBJECTIVES

1. Bank transfer reconciliation: to investigate the forward/reverse flow analysis of transfers

2. Investigation of utility transactions: identify duplicates and missing transactions

3. Transaction status mismatches: how many transactions have status discrepancies and the total value

4. Service provider: find out which service provider is unreliable

5. Revenue analysis: calculate the value of all missing/mismatch transactions

6. Trend analysis: when are these issues most common?

DATASETS DESCRIPTION

- app_transactions.csv

- banklink_transactions.csv

- coralpay_transactions.csv

- irecharge_transactions.csv

- nibbs_transactions.csv

- key fields — txnref, date, time, amount, transaction_type, status, provider, settlement_date, transaction_id, service_type

DATA CLEANING

- change date and time columns using DATE and TIME

KEY KPIs

Total Transactions Processed	80000
Reconciled Transactions Count	67470
Orphaned Value	184,382,610
Reconciliation Rate (%)	84.3
Unreconciled transactions value	Over 270million
Provider Failure Rate (Coralpay vs Irecharge)%	12.0 vs 11.8
Duplicate Transactions	93

FINDINGS 1

- Bank transfers done on the app are 40,054. Meanwhile 38,002 made it to banklink and only 35,907 is seen on NIBBS

- 34,862 transactions are seen across the 3 services (app → banklink → NIBBS), 28750 are successful

- 1140 banklink transactions have no matching app record

- About 718 NIBBS transactions have no matching banklink record

ghost_banklink_transfers	amount	status	settlement_date
BL1751570643	1721.02	failed	2025-01-09
BL2568190830	22114.1	successful	2025-12-12
BL6432174509	47605.54	failed	2024-08-19
BL7288894933	38685.85	successful	2025-04-06
BL7555084502	49428.57	failed	2024-04-16
BL9790570265	48360.28	successful	2024-10-13
BL1608005997	48942.67	failed	2025-09-15
BL3756472007	378.03	successful	2025-02-22
BL0074982407	30658.74	failed	2024-12-17
BL1190188579	19242.29	successful	2025-12-29
BL6329473980	49553.34	successful	2024-10-05
BL1436755154	23388.75	failed	2025-03-10

FINDINGS 1 Contd.

- About 2052 transactions exist in the app but are missing in banklink.

- 3235 transactions exist in banklink but are missing in NIBBS

- Total value of the orphaned transactions is 135,193,832. Orphaned transactions are transfers that encountered gateway failure(money debited but stuck) and settlement failure (stuck in transit)

orphaned_tranz_count	total_orphaned_value
5287	135193832

- These orphaned transactions are more successful (about 83%).

FINDINGS 2

- No app utility transactions appear in BOTH coralpay and irecharge. Meanwhile 93 coralpay duplicate transactions are seen in the app

count_duplicate_coralpay	total_duplicate_coralpay
93	4796950

- 2016 app utility transactions are missing from BOTH providers

missing_utility_count	total_missing_utilty
2016	49188778

- No app transactions went to the wrong provider

- 386 coralpay and 371 irecharge transactions have no matching app record

FINDINGS 3

- 922 transactions are "successful" in app but "failed" in banklink

- 522 transactions are "successful" in banklink but "failed" in NIBBS

- Total of 1168 utility transactions have status mismatches between app and providers

utility_status_mismatches	total_utility_mismatches
1168	29044781

- The total value of transactions with status discrepancies is 65,553,947

count_status_discrepancies	total_status_discrepancies
2612	65553947

FINDINGS 4

- The success rate for transactions through banklink vs direct to NIBBS is 81%

- The success rate for utility transactions to coralpay is 82.2% vs 81.8% to irecharge.

- Irecharge provider has the most missing transactions. Coralpay provider has 802 missing transactions while irecharge has 1214. Missing transactions here refer to coralpay/irecharge transactions on the app that did not make it to the respective providers.

coralpay_mssing_tranz	irecharge_missing_tranz
802	1214

- Irecharge provider has the most status mismatches. Coralpay provider has 536 status mismatches while irecharge has 632.

coralpay_status_mismatch	irecharge_status_mismatch
536	632

FINDINGS 5

Transaction discrepancies	Total count	Total value
Missing transactions from banklink	2770	71,013,660
Missing transactions from NIBBS	3235	82,540,012
Missing utility transactions	2016	49,188,778
Duplicate utility transactions	93	4,796,950
Status mismatched transactions	2612	65,553,947
Daily average loss rate	---	6.6%

FINDINGS 6: Identifying Trends

- Reconciliation issues are usually higher on Tuesdays and lesser on Mondays

- Reconciliation issues is non-linear during the months of the year with July, October and March at the peak and February the lowest

day_name	no_of_issues
Tuesday	1734
Thursday	1711
Friday	1693
Sunday	1687
Wednesday	1647
Saturday	1642
Monday	1616
NULL	612

month_name	no_of_issues
July	1036
October	1003
March	1002
May	988
December	984
September	975
August	968
January	966
April	965
June	964
November	948
February	931
NULL	612

FINDINGS 6: IDENTIFYING TRENDS

- Transaction failure times are higher by 1pm and lowest by 6pm.

hour_of_day	transaction_count	total_amount
13	454	11011654
4	432	10760339
14	427	10723394
17	411	10062503
10	411	10352016
20	410	10115221
21	407	10113345

- Transaction issues do not correlate with transaction volume spike, as we have more issues on Thursdays and more transactions on Tuesdays.

day	issues_count	transaction_count	total_value
Thursday	757	11412	286145652
Tuesday	756	11613	291399911
Saturday	754	11396	287997813
Friday	748	11244	282438218
Wednesday	745	11524	285446767
Monday	741	11317	285206268
Sunday	735	11495	288904429

SUMMARY OF FINDINGS

- 28,750 bank transfer initiated in the app successfully flows through Banklink and reaches NIBBS for final settlement

- Total value of the orphaned (app transfer) transactions is 135,193,832 (customer money that is stuck)

- 81% success rate of transactions seen across the 3 services

- Utility transactions are processed by either Coralpay or Irecharge.

- There are 93 duplicate utility transactions that is seen in Coralpay channel. The value is 4,796,950

- Value of missing (orphaned) utility payments is 49,188,778

- The total value of transactions with status discrepancies is 65,553,947 (money that was never actually received).

- Irecharge provider has the most missing transactions and the most status mismatches

- The rate of transaction failure in coralpay is slightly higher than that of irecharge with 0.2%

SUMMARY OF FINDINGS Contd.

- 12530 transactions have reconciliation issues. This is about 15.7% of the total transactions processed

- Unreconciled transactions is over 270million naira in volume.

- Transaction failure times are higher by 1pm and lowest by 6pm

- Transaction issues do not correlate with transaction volume spike, as we have more issues on Thursdays and more transactions on Tuesdays.

RECOMMENDATIONS

- Implement automated end-to-end transaction tracking across App → Banklink → NIBBS to immediately flag transactions that do not reach final settlement, in order to address orphaned & stuck fund

- Introduce time-based escalation rules (e.g., auto-alert if a transaction is not completed within specified minutes)

- Create an automated reversal/refund workflow for orphaned transactions to prevent prolonged customer fund lock-up.

- Prioritize recovery of the ₦135M App-transfer orphaned funds and ₦49M missing utility payments due to direct customer impact and regulatory risk.

- Set a minimum acceptable success-rate SLA (e.g., ≥97%) across all services, to improve the current 81% rate

- Introduce retry logic with idempotency keys to reduce failures caused by transient network or provider issues.

- Enforce duplicate transaction checks (txnref + amount + time) at the Coralpay entry point to eliminate repeat postings.

- Immediately reconcile and resolve the 93 duplicate Coralpay transactions (₦4.8M) and strengthen validation rules.

RECOMMENDATIONS

- Conduct a deep technical and operational review of Irecharge, as it has:
  - the highest number of missing transactions
  - the most status mismatches

- Enforce stricter SLAs and penalties for reconciliation failures with Irecharge.

- Proactively notify customers for delayed or failed transactions and provide clear timelines for resolution.

- Implement status validation checks before marking transactions as "successful" in customer-facing channels.

- Immediately investigate the ₦65.5M worth of transactions marked successful but never received, as this poses financial and reputational risk.

- Increase system monitoring, capacity, and support staffing around 1pm, when failures peak.

- Since transaction issues do not correlate with volume, shift focus from scaling capacity to process and provider reliability, especially on Thursdays.

CONCLUSION

The analysis reveals significant gaps in transaction integrity and reconciliation, with over ₦270 million unreconciled and an overall success rate of 81%, exposing the bank to financial and reputational risk. Issues are driven mainly by system and provider weaknesses—particularly with the Irecharge channel—rather than transaction volume. Immediate focus is required on resolving orphaned funds, strengthening reconciliation controls, and enforcing stricter provider SLAs to protect customer funds and restore confidence.

Thank you