

End-to-End Business Analysis Report

PhonePe Digital Payment Ecosystem

Project Workflow:
Google Cloud → BigQuery → Power BI

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Project Type: End-to-End Business Intelligence

Executive Summary

Project Overview

This project presents an end-to-end business intelligence solution built using **Python** (Google Colab), **Google BigQuery**, and **Power BI**, focused on PhonePe's digital payment ecosystem and its position within India's UPI market. The analysis transforms raw transaction data into meaningful insights, covering multiple verticals — Insurance, Loans, Money Transfers, Recharge & Bills, and UPI Market Intelligence — with an emphasis on performance trends, growth metrics, and competitive market share.

Objective

To design a cloud-based ETL and analytics pipeline that captures and visualizes PhonePe's service performance, customer transaction behavior, and UPI market positioning, enabling data-driven decision-making and demonstrating enterprise-grade data handling.

Key Highlights

- Built a scalable ETL pipeline using Google Colab and BigQuery.
- Created dynamic Power BI dashboards connected via DirectQuery to BigQuery.
- Integrated five business segments and a final UPI Market Intelligence page for market benchmarking.
- Delivered real-time, interactive analysis through KPIs, charts, and state-wise maps.

Strategic Insights

- UPI Market Dominance:** PhonePe leads India's UPI ecosystem with an estimated **46% market share**, surpassing competitors such as Paytm and Google Pay.
- Segment Growth:** Recharge & Bills contribute around 12–15% of total transactions, showing high growth due to daily payment adoption. Money Transfers remain the largest volume driver.
- Geographic Distribution:** Maharashtra and Karnataka lead UPI adoption, accounting for over 25% of PhonePe's total transaction value.
- Business Resilience:** Failure rate below 4%, with “Insufficient Balance” being the most common cause — suggesting strong technical reliability and user trust.

Table 1: Core Performance Metrics (KPIs)

Metric	Value	Description
Overall Success Rate	96.2%	Reliability and smooth user experience
YoY UPI Growth	34.8%	High digital adoption rate
Avg. Transaction Value	₹436	Indicates retail-scale digital adoption
PhonePe Market Share	46.4%	Strong competitive lead in UPI

Business Impact

The analysis demonstrates how a fintech platform like PhonePe leverages UPI to scale digital payments across diverse services, optimizes user engagement and service efficiency through analytics, and strengthens its competitive advantage in India's fintech ecosystem.

Business Analysis Report – Detailed Breakdown

1. Data Engineering & ETL Process

The process was initiated with raw UPI and PhonePe transactional datasets. **Python** (pandas, numpy) was used in Google Colab for the Extract, Transform, and Load (ETL) steps, involving:

- Data cleaning and standardization.
- Feature creation (e.g., PhonePe_Value, Market_Share_%, Transaction_Status).
- Merging and aggregation of related datasets.

The output consisted of cleaned CSVs which were loaded into **Google Cloud Storage** and then ingested into **BigQuery** for subsequent SQL-based modeling.

2. Data Modeling in BigQuery

A robust data model was established in BigQuery by building aggregated views essential for the dashboard's performance. Key aggregations included:

- Total UPI vs. PhonePe transactions and state-wise performance.
- Payment channel distribution and Year-over-Year (YoY) growth calculations.

A `phonepe_project_master_final.sql` query was created to serve as the unified source for all dashboard data points.

3. Visualization Layer (Power BI)

The Power BI dashboard was built with **DirectQuery** connectivity to BigQuery, ensuring real-time data integrity and reducing latency. The dashboard is structured into several focus pages:

Table 2: Dashboard Pages and Focus Areas

Page	Focus	Key Visuals
Overview	Summary of overall PhonePe ecosystem	Total Value, Avg Value, Success Rate
Insurance	Premium payment analytics	Payment status, category breakdown
Loans	Loan type distribution	Product contribution, failure rate
Money Transfer	Core UPI usage insights	Monthly volume, success %
Recharge & Bills	Everyday UPI utility payments	Category-wise analysis, YoY growth
UPI Market Intelligence	Market landscape comparison	Market share, state map, top states

4. Business Insights

- UPI growth is strongly driven by micro-payments and recurring utility transactions.
- Recharge & Bills are emerging as the new frontier of daily UPI use, indicating a fundamental shift in user behavior.
- **Market Expansion:** While Tier-1 states dominate transaction volume, Tier-2 regions exhibit significantly faster YoY growth, signaling crucial market expansion potential.

- **Failure Analysis:** Failure causes are predominantly behavioral (*insufficient balance, PIN errors*) rather than infrastructural, highlighting the technical stability of the PhonePe platform.

5. Technology Stack

Table 3: Project Technology Stack

Layer	Tools Used	Purpose
Data Cleaning	Python (Google Colab)	ETL transformation
Data Warehousing	Google Cloud Storage	Data warehousing
SQL Analytics	Google BigQuery	Data modeling & aggregation
Visualization	Power BI (DirectQuery)	Interactive dashboarding

6. Project Deliverables

- `phonepe_data_cleaning_etl.ipynb`: Python ETL notebook
- `phonepe_project_master_final.sql`: BigQuery master SQL query
- `Phonepe Dashboard - POWER_BI.pbix`: Power BI Dashboard file
- `PhonePe_Final_Report.xlsx`: Excel report with summary & charts

7. Project Outcome

This project demonstrates a complete business intelligence lifecycle — from raw data ingestion and transformation to insightful delivery — using cloud-native and enterprise analytics tools. The structure and findings closely reflect real-world data workflows utilized by leading fintech companies in the UPI space.