PhonePe Transaction Insights Report

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An end-to-end analysis and visualization project on India's Digital Payment Landscape using PhonePe Data

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1 Introduction

This project aims to extract, process, analyze, and visualize PhonePe transaction data across India to derive business-critical insights. Using technologies like Python, MySQL, and Streamlit, the project showcases digital transaction trends, insurance growth, and user engagement patterns over time.

Key metrics such as total transaction volume, amount, and insurance premiums were analyzed along with device brand usage, state-wise distribution, and category-wise patterns. The insights aim to support decision-making for improving user outreach and financial product expansion.

2 Project Objectives

- Extract and clean PhonePe JSON data across multiple years and levels (state, district, pincode).
- Load structured data into a MySQL database.
- Perform SQL-based aggregation and visual analysis.
- Build an interactive dashboard using Streamlit.
- Generate actionable insights for business and technical teams.

3 Technology Stack

- **Backend**: Python, Pandas, JSON parsing
- **Database**: MySQL (loaded via SQLAlchemy)
- **Frontend**: Streamlit
- **Visualization**: Plotly, Matplotlib
- **Tools**: VS Code, MySQL Workbench, Git

4 Data Overview

- **Transaction Count**: 235.3 Billion
- **Transaction Amount**: *(INR)*345.58 Trillion
- **Registered Users**: 3.46 Billion
- **Insurance Premiums Collected**: *(INR)*20.01 Billion

Quarterly Transaction Amount:

- Q1: *(INR)*73.3T

- Q2: *(INR)*82T
- Q3: *(INR)*88.2T
- Q4: *(INR)*101.9T

5 Visualizations and Analysis

Transaction Trends Over the Years

- 2018: 1B
- 2019: 4B
- 2020: 7.97B
- 2021: 19.29B
- 2022: 39.3B
- 2023: 64.26B
- 2024: 99.31B

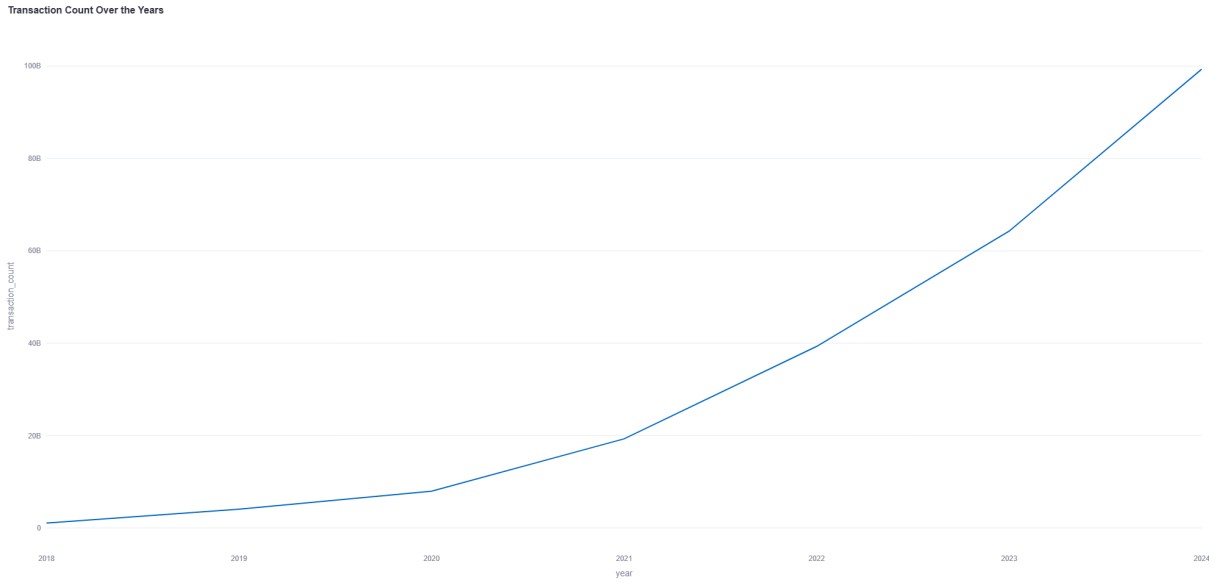

Figure 1: Transaction Growth Over the Years

Top 10 States by Insurance Premium

- Karnataka: *(INR)*2.7B
- Maharashtra: *(INR)*2.3B
- Uttar Pradesh: *(INR)*1.74B

- Tamil Nadu: *(INR)*1.55B
- Kerala: *(INR)*1.3B

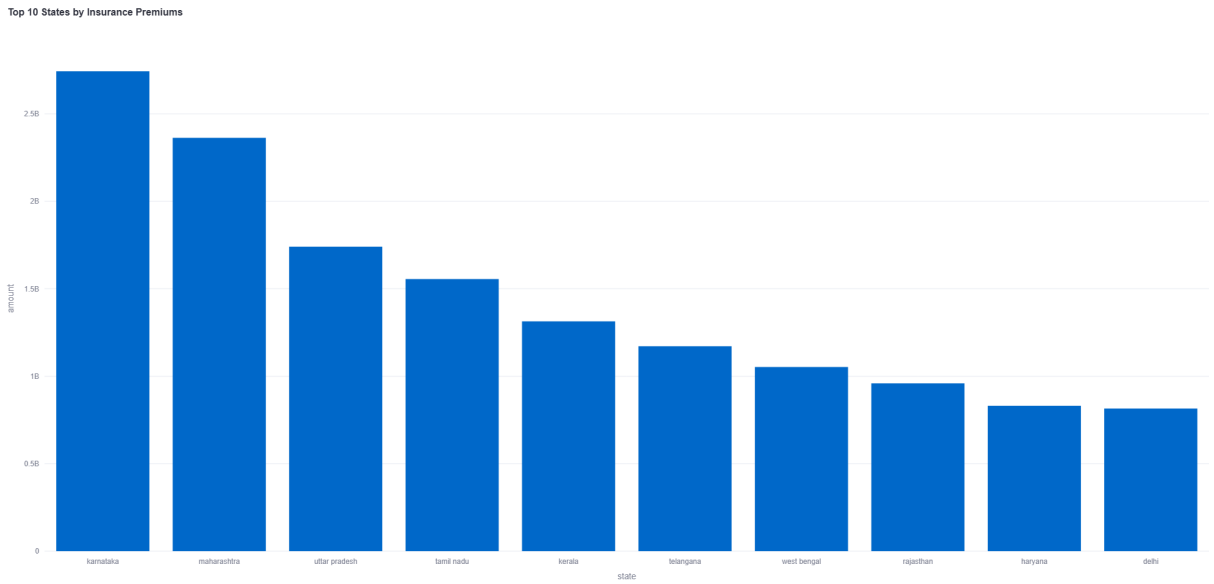

Figure 2: Top States by Insurance Collection

Top 10 Device Brands

- Xiaomi: 869.4M users
- Samsung: 671.6M
- Vivo: 625.4M
- Oppo: 420M
- Others: 296M

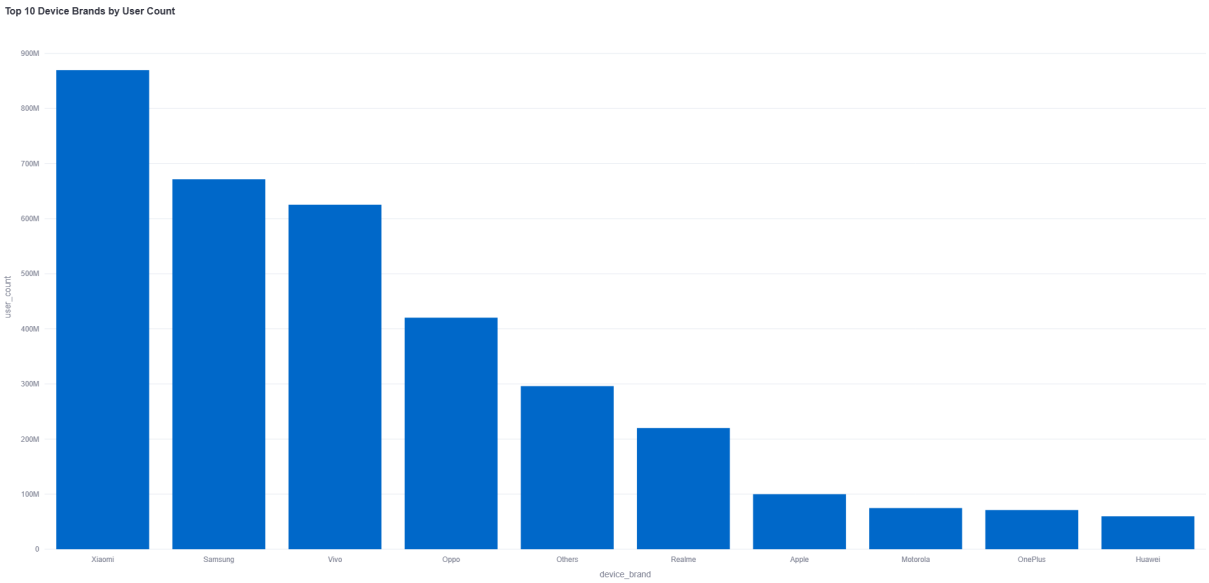

Figure 3: Device Brand Usage by User Count

Category-wise Transaction Share

- Merchant Payments: 55.3%
- P2P Payments: 36.1%
- Recharge and Bills: 8.33%

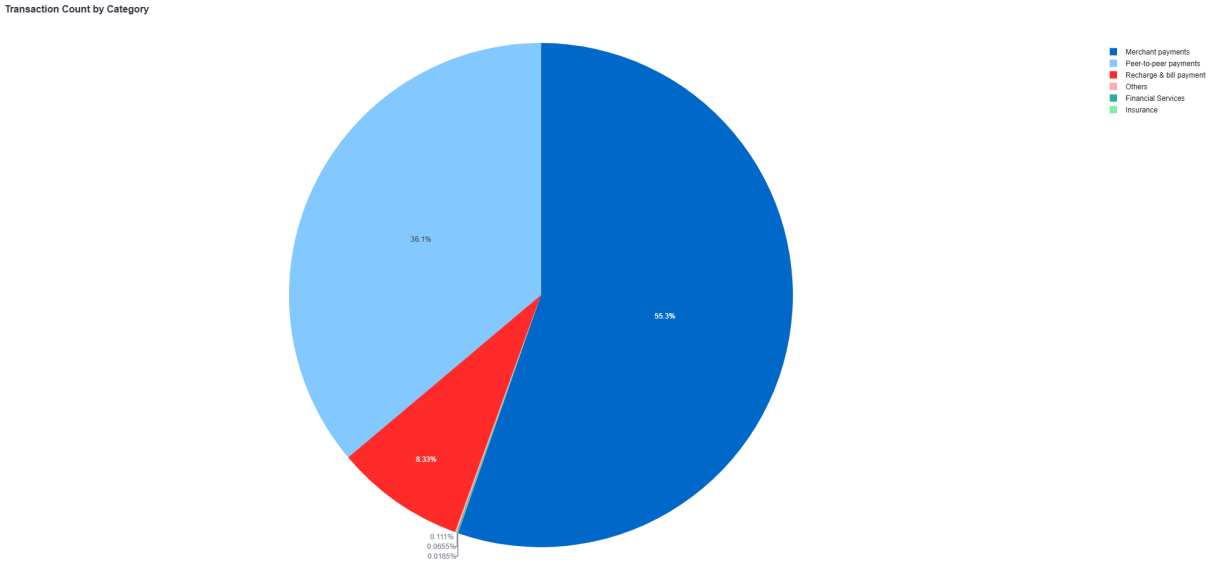

Figure 4: Distribution of Transaction Types

6 Geographic Analysis

Top Performing States

- Maharashtra: *(INR)*32B
- Karnataka: *(INR)*30.9B
- Uttar Pradesh: *(INR)*18.5B
- Rajasthan: *(INR)*17.1B
- Madhya Pradesh: *(INR)*14B

Low Performing Regions

- Mizoram, Sikkim, Nagaland: *(INR)*145M each
- Lakshadweep and Ladakh: *(INR)*170M
- Manipur: *(INR)*150M

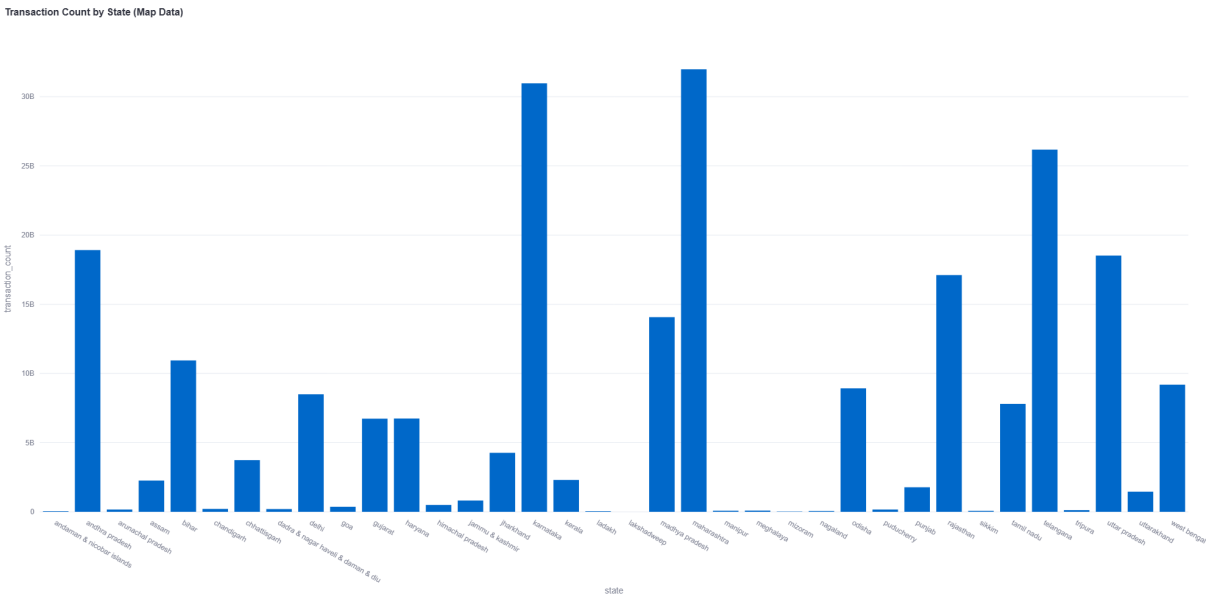

Figure 5: State-wise Transaction Distribution

7 User and Insurance Growth

Insurance Growth Over Time

- 2020: 788.25K
- 2021: 1.5M
- 2022: 3.09M

- 2023: 3.98M
- 2024: 5.06M

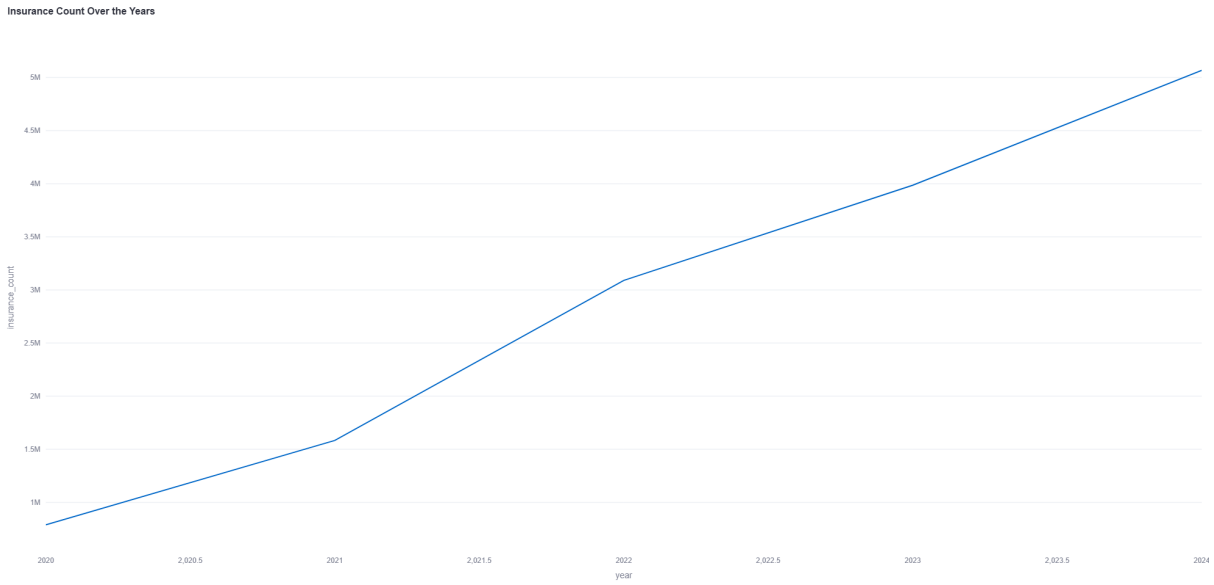

Figure 6: Insurance User Growth (2020–2024)

8 Key Insights

- Massive growth in transaction count from 1B (2018) to 99.3B (2024).
- Karnataka and Maharashtra lead in both transactions and insurance premiums.
- Tier-2 states like Odisha and Jharkhand show significant emerging growth.
- Xiaomi is the top-used brand, signaling strong Android user base.
- Merchant payments dominate usage, showing strong retail transactions.

9 Actionable Recommendations

1. **Regional Strategy:** Focus outreach in underperforming regions to drive inclusion.
2. **Device Optimization:** Ensure app stability and performance for top Android brands.
3. **Insurance Awareness:** Promote insurance in states with low premium collection.
4. **Quarter Planning:** Launch features during high activity quarters (Q3, Q4).
5. **Merchant Ecosystem:** Expand onboarding and support in rural areas.

10 Conclusion

This project demonstrates the ability to extract, transform, and visualize national-scale digital transaction data. It provides insights that can influence business and technical strategies in digital payments and financial inclusion.

The end-to-end pipeline—from JSON data to visual dashboards—can be extended with anomaly detection, forecasting, and deeper regional segmentation to further enrich insights and impact.

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GitHub Repo: https://github.com/SadabAli/PhonePe-Transaction-Insights/tree/main/src