



# PHONE PE TRANSACTION INSIGHTS

ANALYZING DIGITAL PAYMENT TRENDS USING PYTHON, SQL, AND STREAMLIT

## TOOLS USED

PYTHON | PANDAS | MYSQL | STREAMLIT | PLOTLY

# SMALL INTRO ABOUT PHONE PE



PhonePe is an Indian digital payments and financial services app used for a variety of transactions, such as sending money, paying bills, and recharging mobile phones. It allows users to make payments through multiple methods, including linking their bank account via the BHIM UPI system, debit/credit cards, or a PhonePe wallet. In addition to payments, the platform offers financial services like insurance, investments, and loans.

- **Payments and recharges:** Users can send and receive money, pay utility bills, recharge mobile and DTH services, and pay at online and offline stores.
- **Financial services:** PhonePe has expanded to include a range of financial services like purchasing gold, mutual funds, and various insurance products.
- **Direct bank account access:** By linking a bank account, users can make payments directly from their bank without needing to top up a wallet first.
- **Other services:** The app also includes features for consumer lending and a platform for merchants to accept payments and access loans.

# PROBLEM STATEMENT



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- **OBJECTIVE:**
- To analyze user transactions, engagement, and insurance data from PhonePe across India to uncover usage patterns, growth potential, and device-based user behavior.
  
- **KEY GOALS:**
- Identify high-performing states and underperforming regions.
- Analyze user engagement across devices.
- Understand insurance penetration and growth.
- Create an interactive dashboard for insights.

# DATA SOURCE , EXTRACTION & DATA CLEANING



- **SOURCE:**

- Extracted JSON files from PhonePe Pulse (official open-source data).

- **FILES USED (9 TABLES):**

- Aggregated\_Transaction\_data
- Aggregated\_Insurance\_data
- Aggregated\_User\_data
- Map\_Insurance\_data
- Map\_Transaction\_data
- Map\_User\_data
- Top\_Insurance\_data
- Top\_Transaction\_data
- Top\_users\_data

- **DATA CLEANING**

- Processed & Cleaned in Google Colab.
- Standardized column names (Transaction\_count, Transaction\_amount, etc.)
- Converted data types (INT, FLOAT, VARCHAR).
- Filled missing values (Unknown, 0).
- Removed duplicates.
- Standardized state names (“Andhra Pradesh”, “Tamil Nadu”, etc.).



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## DATABASE SETUP

- **Cleaned tables ready for MySQL integration.**
- **I have creates a Database in TiDB cloud and it is connected with My SQL workbench.**
- **I have created a Database: phonepe**
- **I have pushed all data into my SQL workbench from Google Colab.**
  
- **TOOL: MySQL Workbench / TiDB Cloud**
- **TABLES LOADED: All 9 cleaned datasets**



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## BUSINESS CASE STUDIES

Let us discuss about 5 Business Scenarios using the 9 tables data extracted from Json file.

- 1 Decoding Transaction Dynamics on PhonePe.**
- 2 Device Dominance and User Engagement Analysis .**
- 3 Insurance Penetration and Growth Potential Analysis.**
- 4 User Engagement and Growth Strategy.**
- 5 Transaction Analysis Across States and Districts.**

I have used a MySQL workbench to write a query to collect data from the 9 tables for these 5 business scenarios.

# 1. DECODING TRANSACTION DYNAMICS ON PHONEPE SCENARIO

**Decoding Transaction Dynamics** Understand how transaction types vary by state & time.

## BUSINESS SCENARIO

- Analysis of transaction data across **states, quarters, and categories** revealed **uneven growth**.
- Some regions show **steady transaction growth**, while others indicate **stagnation or decline**.
- Leadership aims to identify **key growth drivers** and **problem areas** to optimize regional strategies.
- HIGH-PERFORMING STATES** : Karnataka — Year: 2024, Quarter: 4, Value: 4,151,819,803,822.00
- UNDERPERFORMING STATES:** Lakshadweep — Year: 2018, Quarter: 1, Value: 1,928,611.18

## SOLUTIONS

- Launch state-specific marketing and cashback programs in underperforming areas.
- Increase onboarding of local merchants in low-performing districts.
- Introduce reward programs to boost user engagement and repeat transactions.



## 2. DEVICE DOMINANCE AND USER ENGAGEMENT ANALYSIS

### SCENARIO

- PhonePe wants to enhance **user engagement** and **app performance** by understanding usage trends across **different device brands**.
- Analysis shows that while some brands have **high registrations**, their **app opens** are **low**, indicating **underutilization** or **poor engagement**.
- Regional variations in device dominance affect user activity levels.
- **HIGH-USAGE BRANDS:** Tecno, OnePlus, Apple, Huawei, Infinix — strong user engagement.
- **UNDERUTILIZED BRANDS:** COOLPAD, Gionee, Asus, Micromax, Motorola --- high registrations but low app open rates.

### SOLUTIONS

- Improve app performance for underperforming devices.
- Offer targeted in-app promotions by device type.
- Continuously track engagement by brand and region.
- Collaborate with top device manufacturers for bundled offers.



### 3. INSURANCE PENETRATION AND GROWTH POTENTIAL ANALYSIS

#### SCENARIO

- PhonePe is expanding its **insurance services**, offering users a range of policy options.
- With growing transactions, the goal is to **analyze growth patterns** and identify **underpenetrated states**.
- The focus is to find regions where **insurance adoption is low** but **digital engagement is high**, to target new opportunities.
- **HIGH-PERFORMING STATES:** Maharashtra, Karnataka, Tamil Nadu — strong growth and policy renewals.
- **LOW-PERFORMING STATES:** Bihar, Odisha, Jharkhand — low insurance penetration despite user growth.

**OVERALL TREND:** Insurance transactions and value shows after 2021 to 2024 is increasing day by day.

#### SOLUTIONS

- **Regional Targeting** – Focus campaigns in low-adoption states using local languages and influencers.
- **Bundled Financial Products** – Combine insurance with UPI or recharge offers for better reach.
- **Awareness Campaigns** – Educate users about micro-insurance benefits.



## 4. USER ENGAGEMENT AND GROWTH STRATEGY



### SCENARIO

- PhonePe aims to **boost user engagement and retention** by analyzing behavior across **states and districts**.
- Data reveals patterns in **registered users vs app opens**, showing engagement disparities by geography.
- Understanding these differences can drive **targeted growth and personalized marketing** strategies.

### TOP PERFORMING STATE

- **Maharashtra** — Year: 2024, Quarter: 4, Value: 71,807,805.00

### LOWEST PERFORMING STATE

- **Lakshadweep** — Year: 2018, Quarter: 1, Value: 501.00

**OVERALL TREND :** App opened by the user is increased year by year from 2018 to 2024 but the usage is very low compared with app open.

### SOLUTIONS

- **Gamified User Experience** – Introduce rewards, badges, and milestones to encourage daily usage.
- **Personalized Push Notifications** – Tailor app messages based on transaction frequency and region.
- **Localized Marketing Campaigns** – Regional ads and content in local languages to increase familiarity.
- **Data-Driven Retention Programs** – Identify churn-risk users and target them with offers or reminders.
- **Referral & Loyalty Programs** – Incentivize existing users to bring in new active users.

# 5. TRANSACTION ANALYSIS ACROSS STATES AND DISTRICTS

## SCENARIO

- PhonePe is analyzing transaction data to uncover **top-performing states, districts, and pin codes by volume and value**.  
The goal is to identify **high-engagement zones** and **underperforming regions** to guide **marketing and operational decisions**.

### TOP PERFORMING STATE

- Karnataka** — Year: 2024, Quarter: 4, Value: 4,151,819,803,822.00

### LOWEST PERFORMING STATE

- Lakshadweep** — Year: 2018, Quarter: 1, Value: 1,928,611.18

- Transaction count and value is overall increased from 2018 to 2024

## SOLUTIONS

- Regional Partnership Programs** – Collaborate with local merchants and government bodies in low-performing states.
- Hyperlocal Marketing** – Target districts/pincodes with low penetration using digital and offline ads.
- Merchant Incentive Schemes** – Reward small vendors to promote PhonePe QR-based transactions..
- Localized Cashback Campaigns** – Boost engagement in rural and Tier-2 cities.



# STREAMLIT DASHBOARD OVERVIEW

Streamlit is an open-source Python library used to create interactive web applications for data science and machine learning projects quickly and easily, using pure Python and requiring no front-end web development experience (HTML, CSS, or JavaScript).

After all process final step is to view the phone pe data and business case in streamlit view for that I used Visual studio to present the all tables in streamlit view.

**Tool:** Streamlit

**Goal:** To visualize and interact with PhonePe insights dynamically.

**Key Features:**

- Sidebar for table view and business case study table selection and filtering
- Real-time MySQL connection
- Data filtering by *State*, *Quarter* and *Year*
- Visual insights using bar charts



The background features a complex, abstract design composed of several concentric circles and arcs. These circles are primarily white or light gray against a dark blue background. Some arcs contain small white arrows pointing clockwise. Numerical values such as 40, 150, 160, 170, 180, 190, 200, 210, 220, 230, 240, 250, and 260 are scattered around the perimeter of the outermost circle. The overall effect is futuristic and dynamic.

**THANK YOU**

**PROJECT BY PRAVEEN**