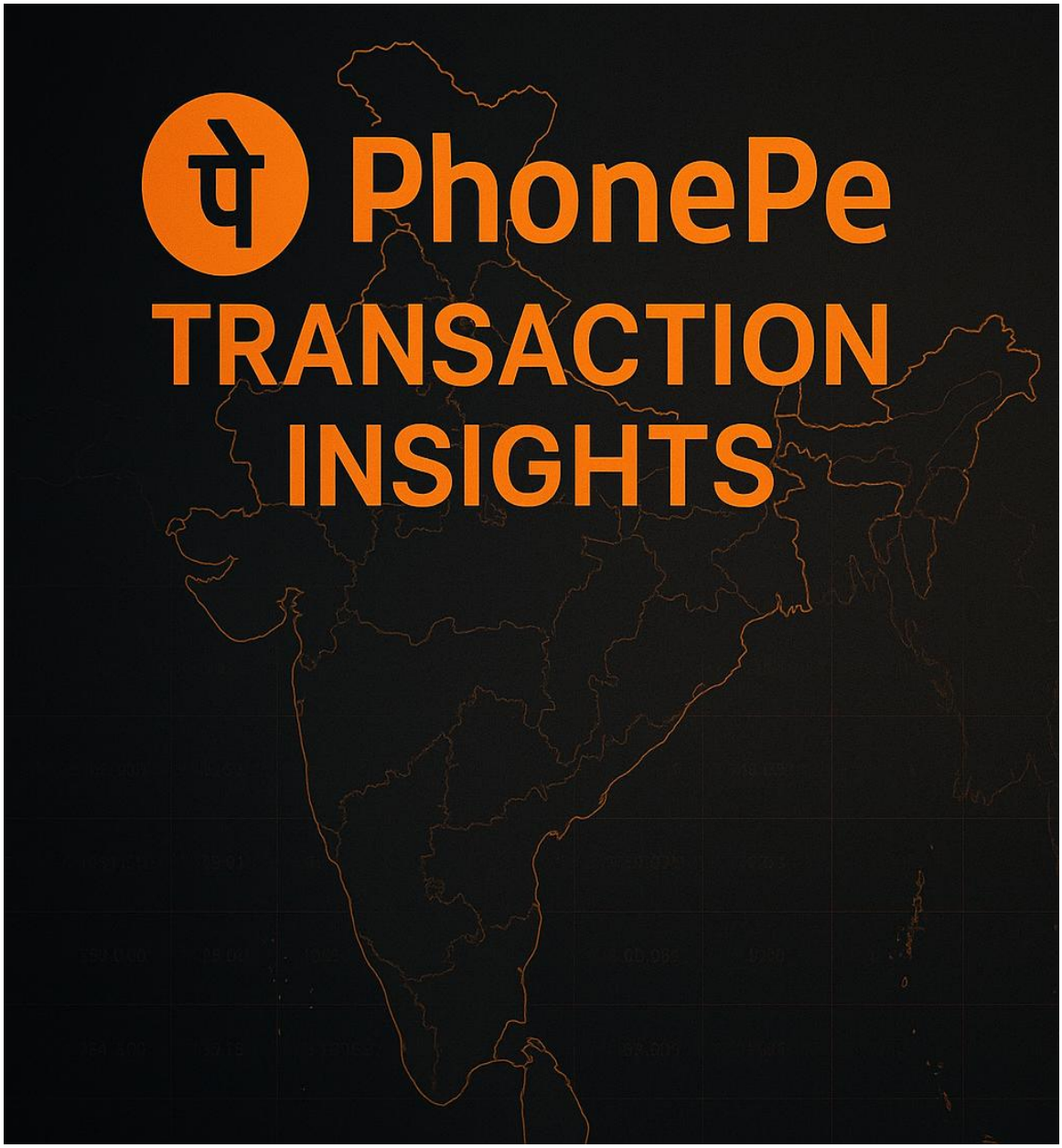
Project Report

Project Title: PhonePe Transaction Insights

Name: Shivam Shashank

Domain: Finance / Digital Payments

Tools Used: Python, SQL, Streamlit, MySQL, Pandas, Plotly



Problem Statement

With the increasing reliance on digital payments like PhonePe, there's a need to analyze transaction trends, user engagement, and insurance adoption across India. This project focuses on extracting, analyzing, and visualizing aggregated payment data to generate valuable insights for businesses, governments, and financial institutions.

Business Use Cases

- Customer Segmentation
- Fraud Detection
- Geographical Insights
- Payment Performance Evaluation
- User Engagement & Retention
- Insurance Insights
- Trend Analysis

Approach

a. Data Extraction

Cloned PhonePe GitHub dataset → Loaded JSON files → Stored in MySQL tables (aggregated, map, and top).

b. SQL Table Setup

Created 9 structured tables:
- Aggregated: transaction, user, insurance
- Map: map_transaction, map_user, map_insurance
- Top: top_user, top_transaction, top_insurance

c. Dashboard Development

Used Streamlit to create an interactive dashboard with state-level map, district-wise bar chart, pie, line, area charts, and AI-based prediction.

Visualizations

1. Choropleth Map: State-wise transaction/user/insurance heatmap
2. Bar Chart: Top 10 districts by transaction amount
3. Pie Chart: Distribution of payment types
4. Line/Area Chart: Quarterly trends

AI Integration

Used OpenAI API to generate insights and forecast future values (quarter-wise) based on historical data trends.

Insights

- UPI transactions in Maharashtra rose by 15.2% in Q4 compared to Q3.
- Insurance adoption remains highest in Karnataka and Tamil Nadu.
- Peer-to-peer payments form 60% of all transactions across India.
- PhonePe user base continues to grow steadily in Tier 2 and 3 cities.

Results & Learnings

- Developed strong understanding of ETL workflows.
- Improved SQL and data analysis skills.
- Gained practical experience building dashboards with Streamlit.
- Understood how AI can assist in data-driven decision making.

Deliverables

- Video Demonstration (with explanation)
- PDF Report (this file)
- Jupyter Notebook (.ipynb)
- Streamlit Dashboard Code
- SQL Dump of Cleaned Data

Dataset Source

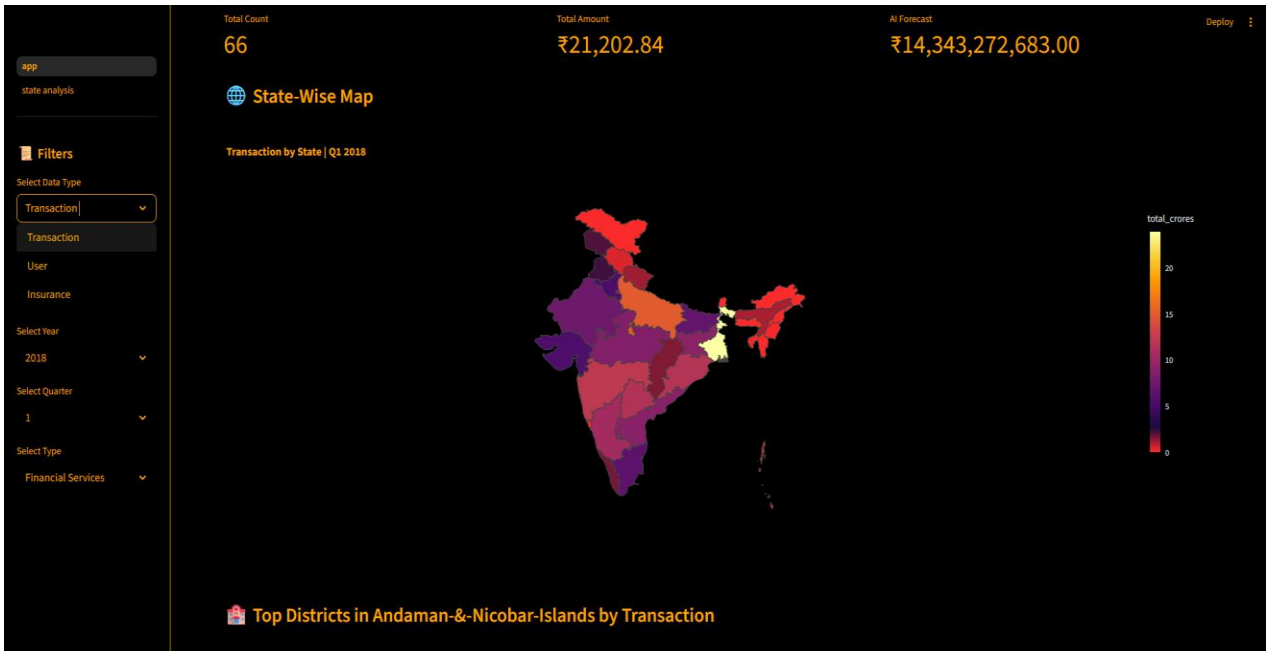
PhonePe Pulse GitHub Repository

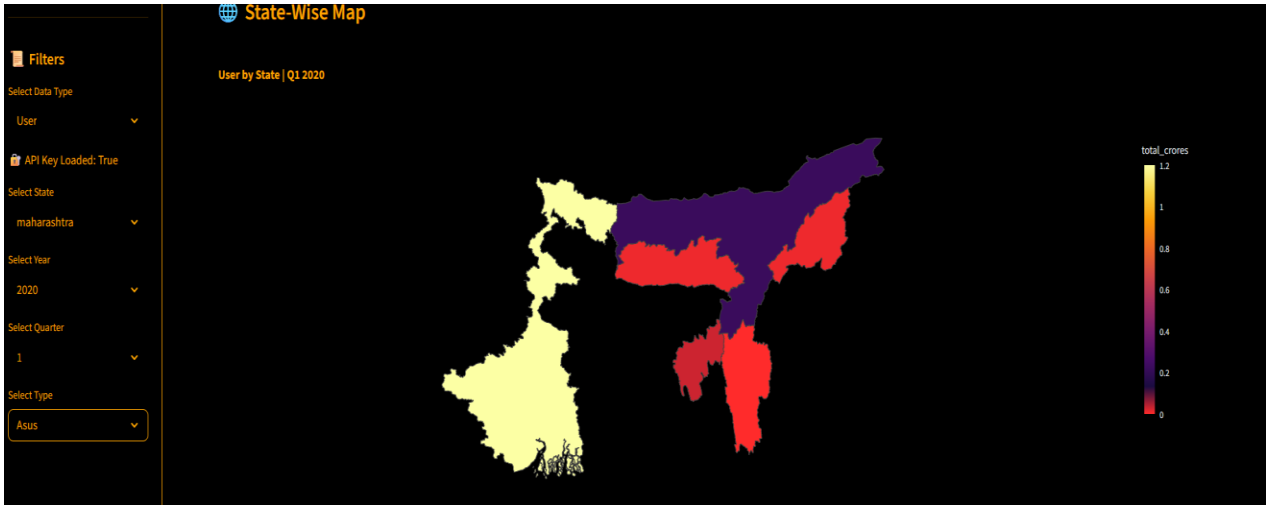
🔗 https://github.com/PhonePe/pulse

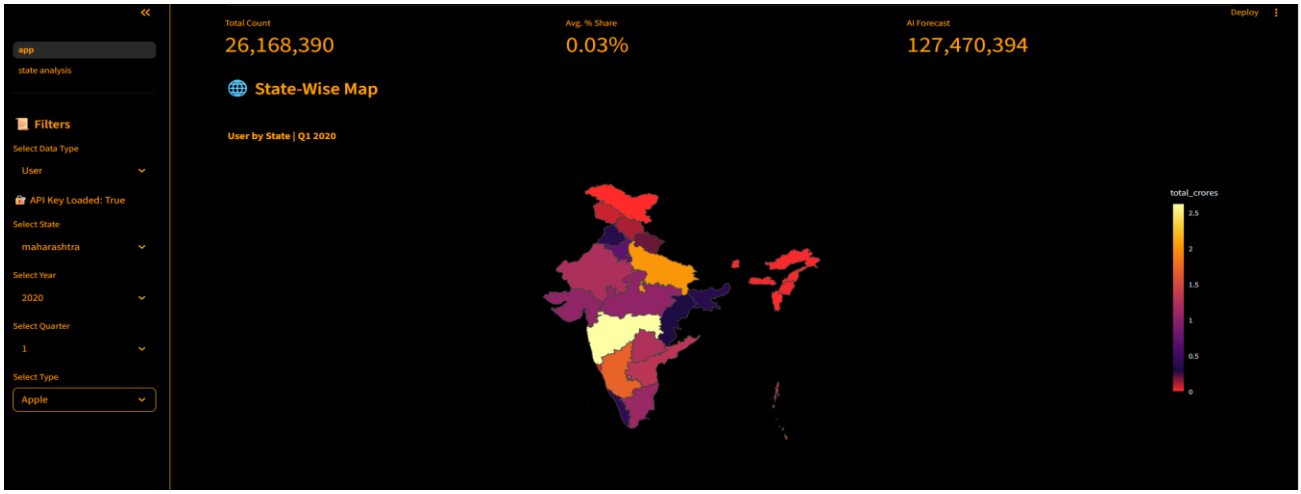
Visual Dashboard Snapshots

To demonstrate the functionality and user interface of the PhonePe Transaction Insights dashboard, here are a few key screenshots from the Streamlit application. These visuals represent dynamic, real-time insights generated from the MySQL database using interactive filters and AI-based predictions.

1. State-Wise Choropleth Map

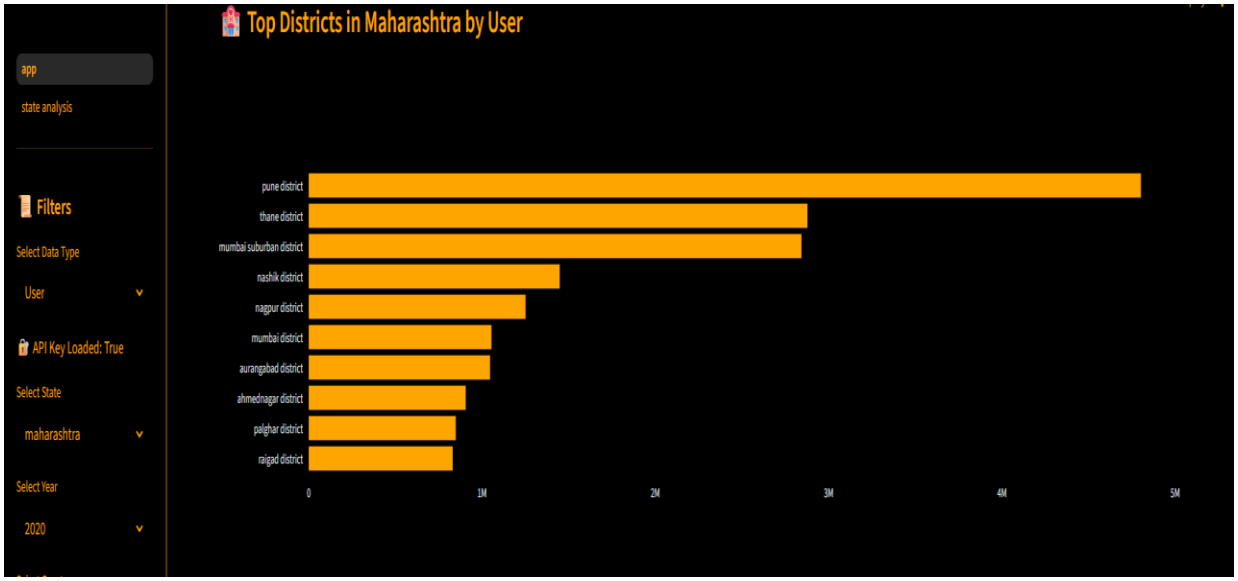


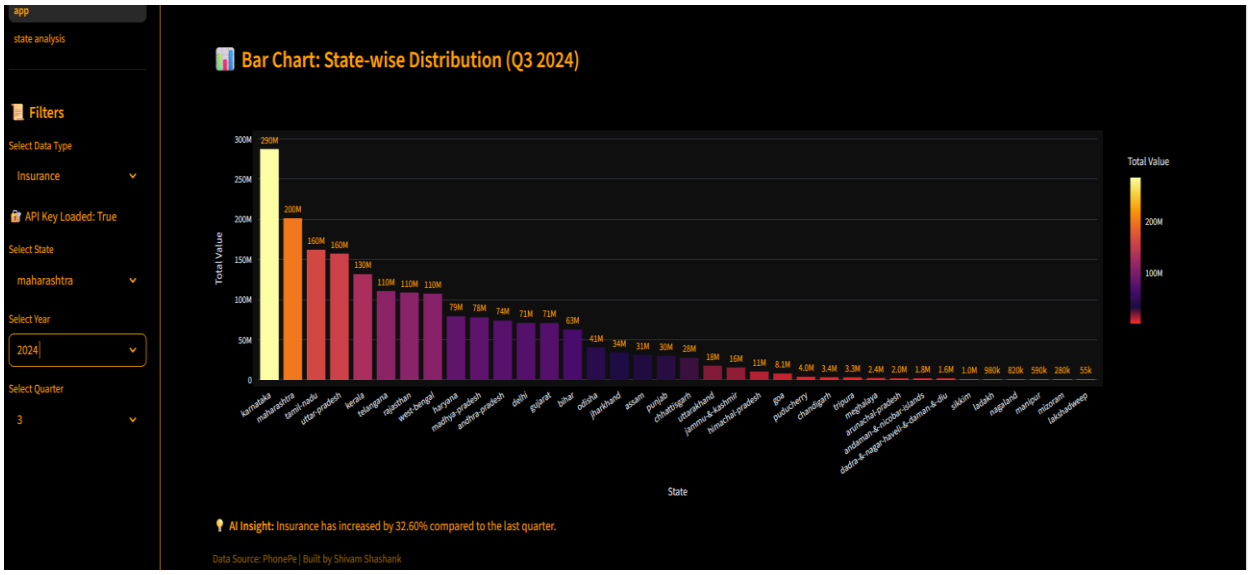


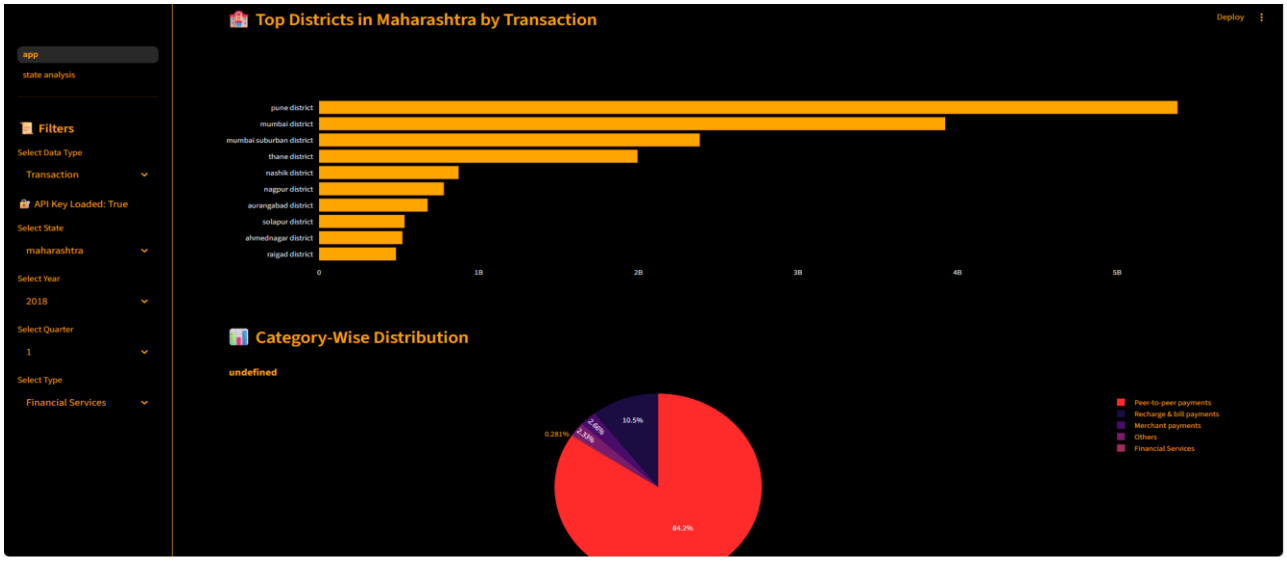


This map displays state-level aggregated transaction, user, or insurance data using a vibrant heatmap. Users can select the **data type (Transaction/User/Insurance)**, **year**, and **quarter** from the sidebar, and the map updates accordingly. It helps identify regional trends and performance.

2. Top 10 Districts Bar Chart

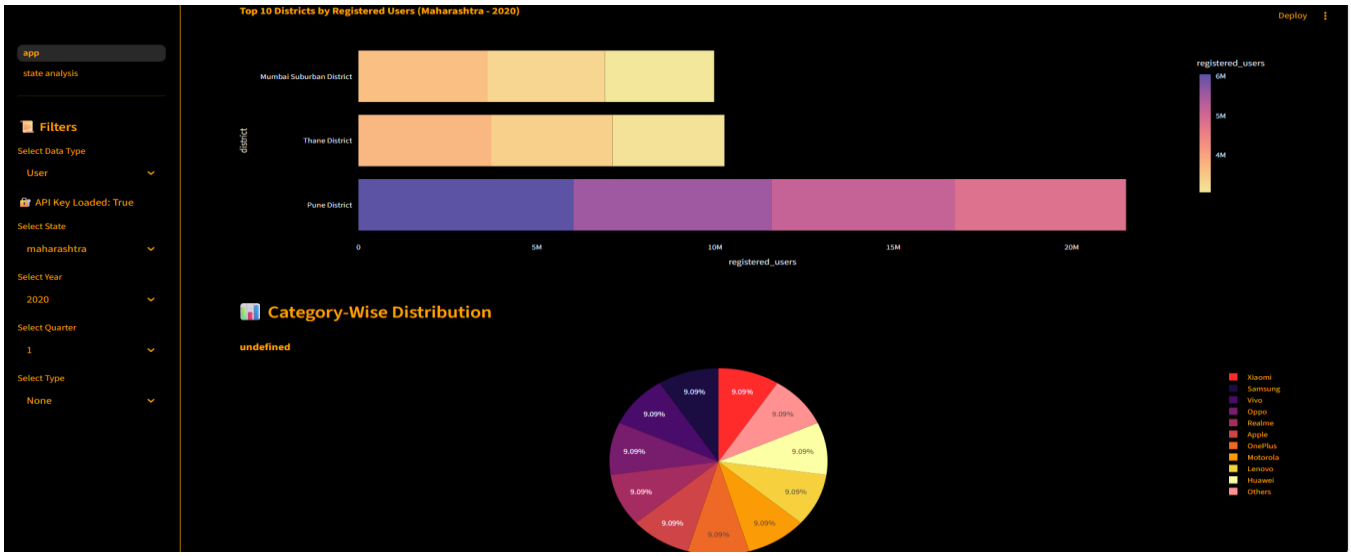


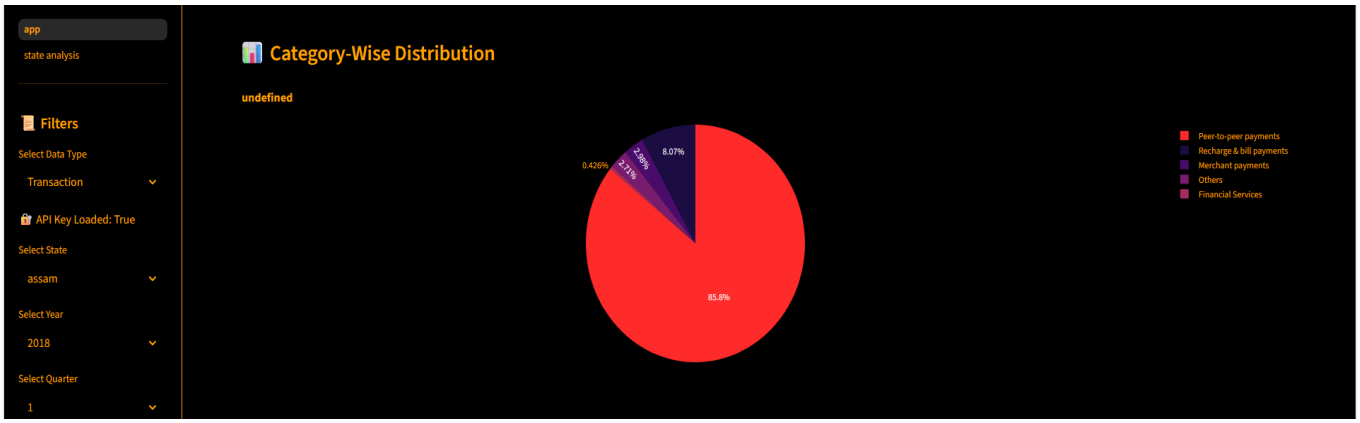


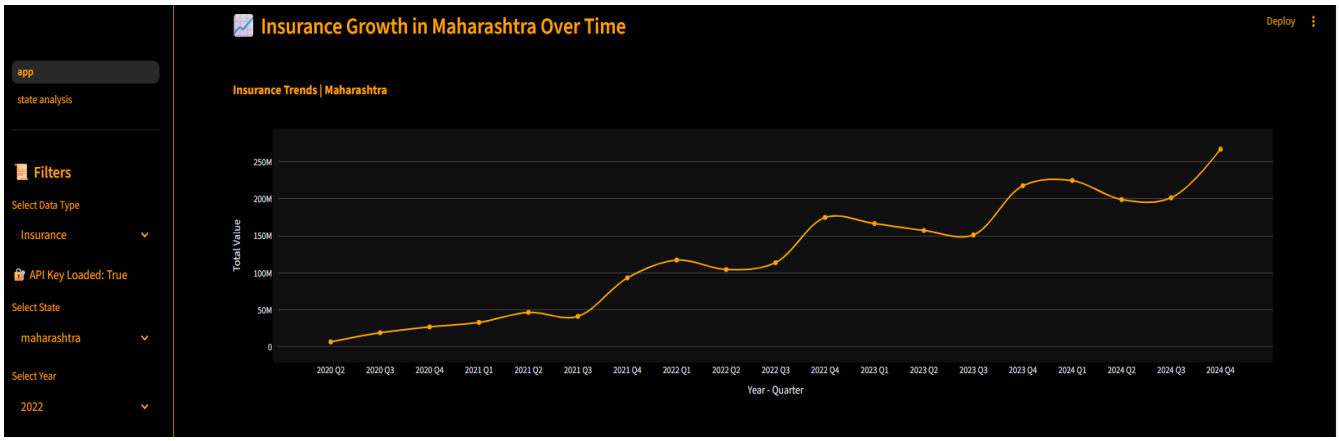


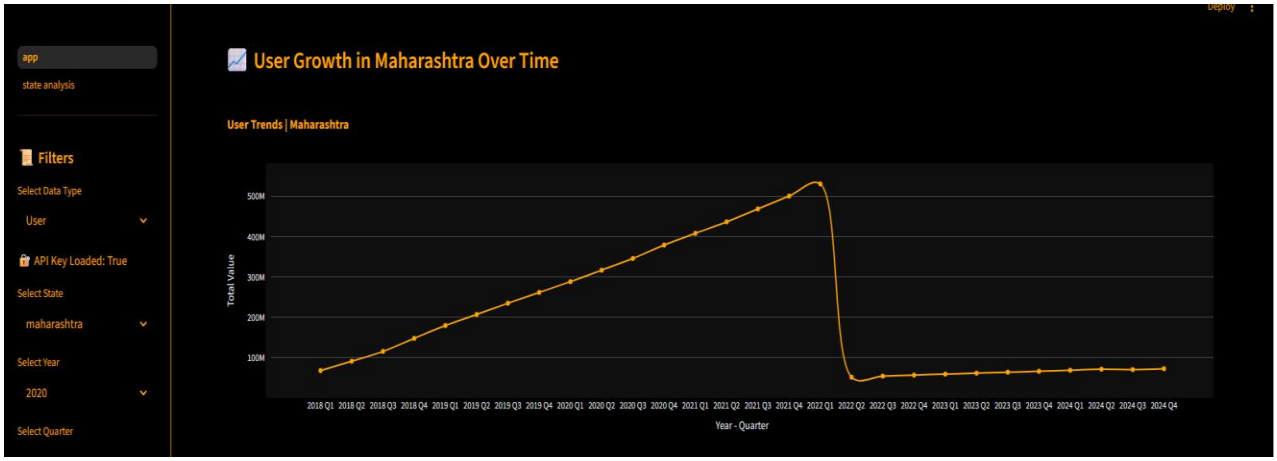
The bar chart visualizes the **top-performing districts** within the selected state based on the filtered metrics. It gives granular insight into where user engagement or transaction activity is the highest.

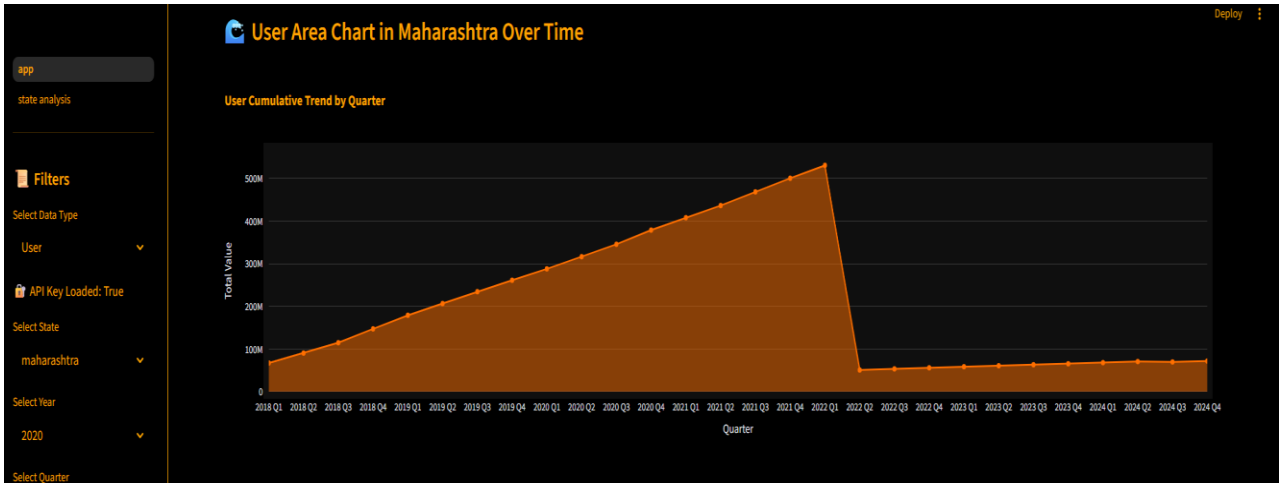
3. Pie & Line Charts

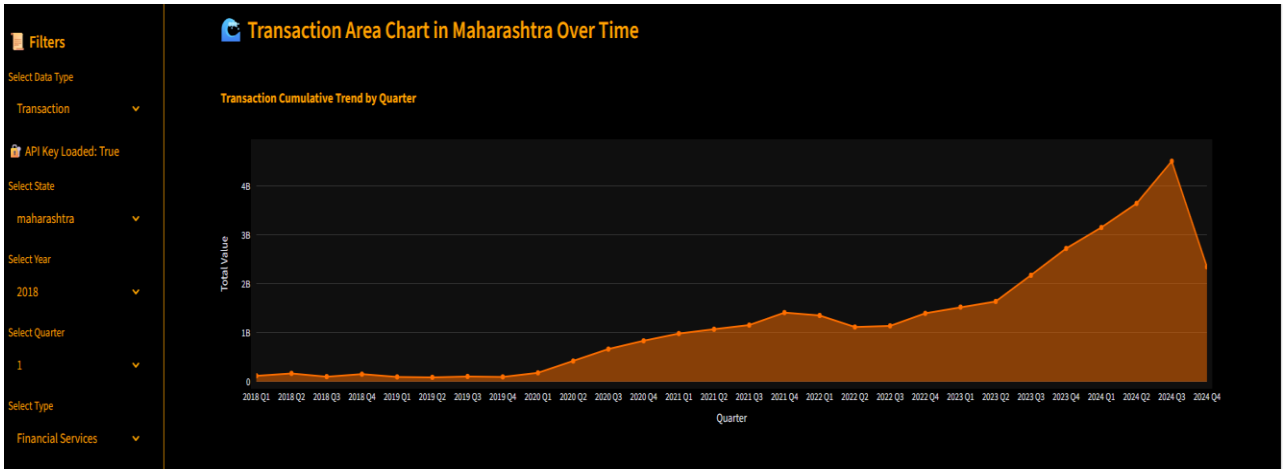

Top 10 Districts by Registered Users (Maharashtra - 2020)
Deploy
app
state analysis
Filters
Select Data Type
User
API Key Loaded: True
Select State
maharashtra
Select Year
2020
Select Quarter
1
Select Type
None
Mumbai Suburban District
Thane District
Pune District
district
registered_users
0
5M
10M
15M
20M
registered_users
6M
5M
4M
Category-Wise Distribution
undefined
9.09%
Xiaomi
Samsung
Vivo
Oppo
Realme
Apple
OnePlus
Motorola
Lenovo
Huawei
Others


app
state analysis
Filters
Select Data Type
Transaction
API Key Loaded: True
Select State
assam
Select Year
2018
Select Quarter
1
Category-Wise Distribution
undefined
85.8%
8.07%
2.38%
2.71%
0.426%
Peer-to-peer payments
Recharge & bill payments
Merchant payments
Others
Financial Services


Insurance Growth in Maharashtra Over Time
Deploy
app
state analysis
Filters
Select Data Type
Insurance
API Key Loaded: True
Select State
maharashtra
Select Year
2022
Insurance Trends | Maharashtra
Total Value
250M
200M
150M
100M
50M
0
2020 Q2
2020 Q3
2020 Q4
2021 Q1
2021 Q2
2021 Q3
2021 Q4
2022 Q1
2022 Q2
2022 Q3
2022 Q4
2023 Q1
2023 Q2
2023 Q3
2023 Q4
2024 Q1
2024 Q2
2024 Q3
2024 Q4
Year - Quarter

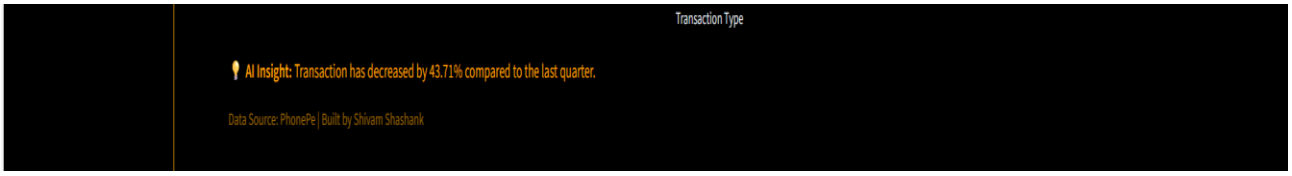

app
state analysis
Filters
Select Data Type
User
API Key Loaded: True
Select State
maharashtra
Select Year
2020
Select Quarter
User Growth in Maharashtra Over Time
User Trends | Maharashtra
Total Value
Year - Quarter


Deploy
app
state analysis
Filters
Select Data Type
User
API Key Loaded: True
Select State
maharashtra
Select Year
2020
Select Quarter
User Area Chart in Maharashtra Over Time
User Cumulative Trend by Quarter
Total Value
Quarter


Filters
Select Data Type
Transaction
API Key Loaded: True
Select State
maharashtra
Select Year
2018
Select Quarter
1
Select Type
Financial Services
Transaction Area Chart in Maharashtra Over Time
Transaction Cumulative Trend by Quarter
Total Value
Quarter

These charts illustrate the **distribution of categories** like transaction types or user brands (for example, P2P vs merchant transactions) and how they trend quarter-over-quarter. This helps track usage evolution over time.

4. AI Forecast & Insights Panel



This section shows automated AI-generated insights and forecasts using OpenAI's language model. It predicts expected transaction/user growth for upcoming quarters and provides insight summaries based on historical data trends.