Problem Statement

Product Dissection for top leading Platforms

Welcome to this case study on dissecting and designing products for top leading platforms. In this case study, you will delve into the intriguing world of schema design for a prominent platform of your choice. Your task is to choose a top leading platform, research its features, and meticulously craft a schema design that encapsulates the essence of its functionality. By focusing on key entities, attributes, and relationships, you will gain invaluable insights into how data architecture drives the platform's effectiveness.

Step 1: Choose a Leading Platform
Select a leading platform of your choice, which could span various domains such as social media, e-commerce, finance, or any other industry. This choice will form the foundation of your exploration into its schema design.

Step 2: Research:
Thoroughly research the platform you have selected. Investigate its core features, functionalities, and user interactions. Identify the top features that define its user experience and contribute significantly to its popularity.

Step 3: Product Dissection and Real World Problems solved by the platform
In this step, you will meticulously analyse the platform's standout features and how they provide innovative solutions to real-world challenges. By identifying key functionalities that resonate with users, you'll unravel how the platform effectively addresses problems and enhances user experiences. This dissection will serve as the foundation for understanding how the schema design aligns with the platform's core objectives.

Step 4: Case Study on the real world problems and approach to solving them
In this pivotal step, you will expand on the real-world challenges uncovered in Step 3 through a comprehensive case study. Delve into specific instances where users encountered difficulties and showcase how the platform's unique features provided effective solutions. By dissecting the approach taken by the platform to overcome these challenges, you'll gain a deeper appreciation for the platform's user-centric design philosophy and how it shapes the schema design.

Step 5: Schema Design Based on Top Features
Based on the features you have identified, craft a schema design that reflects the platform's data structure. Focus on the key entities, attributes, and relationships that underpin the chosen features. Your schema should capture the essence of how the platform organises and utilises its data.

Step 6: Rationale Behind the Design
While creating the schema design, consider the rationale behind the platform's choices. Reflect on why certain entities and relationships were chosen and how they align with the

platform's goals. This will help you understand the strategic decisions driving the schema's architecture.

Step 7: Create an ER Diagram
Utilise tools like the Miro platform or similar applications to create an illustrative Entity-Relationship (ER) diagram. This diagram should vividly depict the entities, attributes, and relationships present within your schema design. The ER diagram will serve as a visual representation of your insights.

Step 8: Presentation of Findings
Present your findings in a clear and concise manner. Showcase your understanding of how the schema design impacts the platform's functionality and user experience. Explain how your chosen features are integrated into the schema and how the schema's structure supports the platform's objectives.

Task Details:

1. **Answer Submission:** Your submission should include well-structured solutions for all provided questions related to product schema designs.

2. **Video Creation:** Create an informative and engaging video where you thoroughly explain the Case Study.

3. **Depth and Clarity:** Ensure your solutions are detailed and showcase your understanding of product schema design principles. Similarly, in the video, provide clear explanations that are easy to understand for a wide audience.

4. **Creativity Encouraged:** You are welcome to utilise visuals, diagrams, or creative elements to enhance the clarity and impact of your explanations.

Note:

1. Duplicate this document and proceed to write your solutions and prepare your video.
2. Include the video link in this document before final submission.

Best of luck in completing this project and showcasing your prowess in dissecting and designing product schema for leading platforms!

Product Dissection for PhonePe

Company Overview:

PhonePe is an Indian multinational digital payments and financial services company headquartered in Bengaluru, Karnataka, India. PhonePe was founded in December 2015, by Sameer Nigam, Rahul Chari and Burzin Engineer. The PhonePe app, based on the Unified Payments Interface (UPI), went live in August 2016. PhonePe is licensed by the Reserve Bank of India (RBI) for the issuance and operation of a Semi Closed Prepaid Payment system. The company aims to offer every Indian equal opportunity to accelerate their progress by unlocking the flow of money and access to services.

Problem 1: Inability to carry out transactions in cashless economy

Real-World Challenge:
Demonetisation in 2016 removed 86% of cash (by value) circulating in the Indian economy. Transacting at stores became a real challenge for customers and shopkeepers alike, who were accustomed to using cash. Cash was the king, and suddenly the king was down.

Majority of customers lacked means to carry out digital payments and most of stores didn't had necessary infrastructure to accept or verify cashless payments. The then prevalent digital payment methods like **Card payments and Netbanking were more complex** and time consuming.

Even the available digital payments methods involved problems related to record keeping and management. Additionally, no UPI based payment system existed to pay foreign merchants till very recently.

PhonePe Solution:
PhonePe capitalized on the opportunity provided by demonetisation and government's encouragement to UPI. It came out with a plethora of business solutions empowering customers and stores all over India, with a mission to make lives easier with cashless payments.

Depending on the size of business and the volume of sales, it offer a wide range of payment solutions. PhonePe is accepted at **3.8 Crore stores - everywhere from small *kiranas* to big supermarkets and showrooms.**

PhonePe provides **Scan 'n' Pay solution,** which is swift, effortless and perfect for small businesses! It provide **QR stickers,** table-top standees and nifty hangings that customers can scan using PhonePay app to make lightning fast payments. The money is credited directly to the bank account.

To keep transactions transparent, PhonePe provides an innovative solution as **PhonePe SmartSpeaker**. It provides loud and clear payment confirmations delivered instantly in up to 11 languages.

Besides, PhonePe provides **POS based solution** which can be merged with store's own point-of-sale systems for easy record-keeping and management. Such a set-up is ideal for stores with high-volume sales, be it local shops or bigger stores. They include:-
1. **Collect Request Solution** to **auto populate** the amount the customers need to pay. The customers get a collect request on their phones and all they need to do is use their PhonePe app to complete the payment.
2. **Dynamic QR**, which is **integrated** with the POS system. When the customers scan and pay, the records are captured in the system.
3. **EDC(Electronic Data Capture) Machine-based Solution**, the **Collect Request & Dynamic QR solutions can be integrated with the EDC machines** at the store as well. Storekeepers can send collect requests to customers using these machines, and a dynamic QR can be set-up on the EDC screen.

In recent times, PhonePe is stepping up to make transactions effortless, globally. The first steps to achieving this ambition came about with two groundbreaking initiatives: **UPI Lite and UPI International.**
UPI Lite allows users to initiate **low-value payments under Rs. 200, with a single tap** from their UPI LITE account without entering a PIN. The transaction is processed directly by debiting the on-device UPI LITE balance, making transactions more seamless and even faster.
UPI International allows PhonePe's Indian users traveling abroad to instantly pay foreign merchants using UPI. The current launch supports all international merchant outlets in UAE, Singapore, Nepal and Bhutan that have a local QR code. PhonePe is the first fintech app to launch this feature in India.

By combining these features, PhonePe enabled customers and stores to continue transacting in easy, hassle-free and transparent manner. PhonePe, today, is synonymous with UPI and has cemented its leadership in the UPI space. In March 2023, it hit an annualized TPV (Total Payment Value) run-rate of USD $1Trillion. Simplifying customer experience while ensuring fast, secure and reliable transactions, has helped it win the trust of millions of Indian users. PhonePe crossed 500 million lifetime registered users on its platform, becoming the first Indian Internet company to have reached this scale globally. Every 1 in 3 Indians are now on PhonePe.

Problem 2: Difficult for offline businesses to scale in face of rising competition from online giants

Real-World Challenge:
Traditional retail businesses face intense competition from online retailers, e-commerce platforms, and big-box stores. These competitors often offer a wide range of products, competitive pricing, and convenient shopping experiences, attracting customers away from traditional brick-and-mortar stores. Online shopping has altered consumer behavior. More people now prefer the convenience of browsing and purchasing products online, impacting foot traffic in physical stores.

PhonePe's Solution:
PhonePe's commitment to equip merchants with the power to scale continues as it offers a suite of solutions for diverse business needs.

The company distributes engaging **'scratch cards'** to its transacting customers on the **Rewards page of the PhonePe app. Storekeepers can use these to distribute coupons for the products/services at their store** thus attracting a segment of consumers.

Additionally, storekeepers can act like **PhonePe ATM**. Customers can discover the shop in **the 'Stores' section, visit the shop, withdraw and pay the withdrawal amount directly on the PhonePe app**. With this, walk-ins can be increased and stores can acquire new nearby customers.

Pincode, a shopping app built on the **ONDC network**, was launched in April 2023. The revolutionary new approach, reflected in the name 'Pincode'**, places local stores and sellers at the forefront and digitally empowers every Indian shopkeeper to tap into the vast potential of e-commerce.**

Credit is the lifeblood of any business. As a step towards driving financial inclusion for SMEs (Small and Medium Enterprises**), PhonePe launched its Merchant lending platform allowing Banks and NBFCs (Non-Banking Financial Companies) to provide access to credit in a completely digital and seamless manner** to its vast merchant base of over 37 million merchants, helping merchants unlock the full potential of their businesses.

Problem 3: Managing multiple apps for various needs.

Real-World Challenge: Over the years, prompted by technological innovations and government policies, the economy is becoming digital. The ways to invest, recharge, pay bills, buying insurance etc are all becoming digital. However, all these diverse needs compel one to keep several apps, remember diverse login-ids and passwords, and keep a track of all of them. All this creates extra challenges in an individual life beyond ones job and family.

PhonePe's Solution:
PhonePe caters to all such needs within the PhonePe app.
Besides transacting and money transfer, PhonePe provides comfortable solution to **recharge-mobile,dth,fastag etc., pay bills- electricity, water, gas etc., pay education fees, loan interests/insurance premium installments, rent, hospital bills etc**. In addition, PhonePe provides the following services through its app.

The **PhonePe Account Aggregator** services allow Indian consumers **to consent to and share all their financial data, such as bank statements, insurance policies and tax filings with regulated Financial Institutions** or FIUs (Financial Information Users) for several use cases such as applying for loans, buying new insurance, getting investment advice, etc.

As a first in the Indian Insurance market, **PhonePe launched a unique monthly subscription option for health insurance plans.** This new feature makes Health Insurance more affordable, allowing individuals to pay premiums in smaller, recurring installments via convenient UPI mandates.

The new **Credit section on the PhonePe app** houses the option for users to view their credit bureau score without any additional cost, conveniently **manage their credit/Rupay cards and repay loans & credit card bills.**

Problem 4: Cyberthreats

Real-World Challenge: As finances and transactions went online, so were the cases of rising online thefts, frauds and cyber crimes. It warrants that digital economy is guarded and secured against such malicious activities. Only then, can less cash economy prevail, as trust, confidence and guarantee are pre-requisites to enforce citizen behaviour changes.

PhonePe's Solution: PhonePe's innovative business solution **'GUARDIAN'** manages and reduces the risk of cyber threats. It prevent fraud efficiently with an automated fraud management platform that scales with the business. **The platform adapts to new-age fraud practices with a combination of data, device and user behavioural attributes** therefore responding quickly to evolving fraud techniques. It secure customer journeys throughout their lifecycle by performing operations at scale with low latencies across multiple channels.

Guardian's features includes **Eval Engine for Pre-Emptive Fraud Detection & Prevention**. It is a real-time evaluation engine built on a **no-code platform** that **allows one to set up rules or deploy models real-time.**

Next, it features **Device Guard which uses risk, transactional, and behavioural data from every device to profile and predict malicious activity and to prevent fraud at source**.

Guardian also includes a **'Knowledge Store' which is a store of attributes for each user which are stored to detect malicious patterns**, making for actionable intelligence to deter fraud.

And finally, Guardian provides a customisable **case management console to help the risk operations** team reduce investigation time and manage compliance-related activity.

Conclusion:
PhonePe's commitment to offer every Indian equal opportunity to accelerate their progress by unlocking the flow of money and access to services is evident in its various offerings. With each new business and product launch, it has pushed the boundaries in the fintech world, leaving a trail of incremental progress. This case study highlights how PhonePe has

today become synonymous with UPI and has cemented its leadership in the UPI space. Simplifying customer experience, providing opportunity for boosting businesses while ensuring fast, secure and reliable transactions, has helped it win the trust of millions of Indian users.

Top Features of PhonePe:

PhonePe is a leader in fintech space with more than **500 million lifetime registered users** on its platform and annualized TPV (Total Payment Value) run-rate of USD $1Trillion as in March 2023. Some of its top features include:

- **Transfer money**: Users can transfer money with few clicks to other a/c by scanning QR code or entering linked mobile number or entering bank a/c details or upi id. Money can even be transferred to oneself a/c in other banks, linked to same mobile number.
- **Receive Money**: PhonePe let users receive money from anyone, by generating a QR code, which needs to be scanned by the remitter.
- **Recharge and Pay Bills**: Users can recharge their mobile, FASTags, DTH or pay Rent, Water/Electricity bills etc,
- **Insurance**: Users can get the subscription or renew insurances for bike, car, health, accidental, life, term, travel etc.
- **Travel bookings**: Users can book flights, trains, bus, hotels directly from PhonePe app.
- **Switch**: On the PhonePe homepage, the user scrolls down to the ‘Switch’ section On clicking on a business app, the user is redirected to the respective m-site/PWA. Users log into the m-site through a ‘Single Click’ login.They make a transaction on the m-site and pay using PhonePe
- **Subscription and Vouchers**: Users can buy or renew subscriptions of new age tech services like OTT, Song/Movie streaming services, App store codes, Online Pharmacies, e-education etc.
- **Credit**: Credit section on PhonePe app allows one to manage credit cards and check credit score for free.
- **Wealth**: Wealth section on PhonePe app provides a simple way to invest in mutual funds(SIP) etc.
- **Rewards**: Vouchers are gifted as a promotional means by companies on PhonePe transactions.They can either be availed or gifted to others.
- **Refer and earn**: This allows users to invite others, and earn credits in wallet.

Schema Description:

The schema for PhonePe involves multiple entities that represent different aspects of the platform. Each entity has specific attributes that describe its properties and relationships with other entities. The following are various entities and their attributes.

Users_profile Entity:
Users are central to PhonePe. The user profile entity contains mandatory information about each user_id on PhonePe:

- User_id (Unique): A unique identifier for each user.
- mobile_Number (not null): User mobile no. linked to the bank account.
- bank name (not null): Add bank in which a/c linked to entered mobile no.
- upi_id (Primary_key): Enter UPI Id for the PhonePe .
- debit_atm_card_last_6_digit: last 6 digits of debit card (not null)
- upi_pin: Enter 4 digit upi pin(not null)
- profile_date: The date when the user profile created on PhonePe.

Authentication Entity:
Authentication is used to enhance security of ones PhonePe account. It contains the following information.Any one of these features can unlock the app.

- auth_id (Primary key): A unique identifier for each user initials.
- upi_id (Foreign_Key): To reference Users_profile table
- pin(in numeric): 4 digit pin to unlock the app
- pattern(in bytea): Screen pattern to unlock the app
- facial_features(in bytea): Face capture to unlock the app
- fingerprint (in bytea): Fingerprint to unlock the app

Users_personal_profile Entity:
This entity records personal information of PhonePe app users.

- person_id (Primary_Key)
- upi_id(Foreign_key): References Users_profile table
- first_Name: The First name of the user.
- last_Name: The Last name of the user.
- email_id: The user's email address for professional communication.
- address: User’s Address
- gender: check('Male','Female','Others') User gender
- age: check(>0 and <120) User age
- marital_status: check Marries,’Unmarried,’Others’) User marital status
- family_members_count: check(>=0) No. of family members of user

Users_financial_profile Entity:
This entitiy records financial information of PhonePe app users.

- person_finance_id (Primary_Key)
- upi_id (Foreign_Key): References Users_profile table
- annual_income CHECK(>=0)
- house_ownership `bool`

- car_ownership `bool`
- two-wheeler_ownership `bool`
- insurances: `CHECK (col in ('Life','Health',’Vehicle’,’Travel’,’Others','No’)`
- investments: `CHECK (col in ('Amount < 50k','50k< Amt < 2L’,’2l< Amt < 10L’,’10L< Amt above 50L’,’50L<Amt<1 cr’,’amt above 1 cr’,’None’)`
- domestic_travel_frequency `CHECK (col in ('Atleast Once a month','Atleat once in 6 month’,’Atleast once a year’,’Once in More than a year’,’None’)`
- international_travel_frequency `CHECK (col in ('Atleast Once a month','Atleat once in 6 month’,’Atleast once a year’,’Once in More than a year’,’None’)`

Wallet_record Entity
Phone Pay wallet is easy to use financial solution to transact quickly.Amt can be credited or debited from wallet.

- wallet_id (Primary_Key)
- upi_id (Foreign_Key): References users_profile table
- pan: stores 10 characters alphanumeric number
- aadhaar: stores 12 characters number
- address_proof_number: stores address proof document number

Wallet_transaction Entity
The entity records all transactions(credit/debit) from the phonePe wallets, corresponding to each wallet id.

- transaction_id (Primary_Key)
- wallet_id(Foreign key) References Wallet record entity
- credit_top_up: Amount credited in wallet
- debit: Amount: Amount debited from wallet
- net_balance:Net of debit and credit
- transaction_time (timestamp with timezone): Capture date,time and timezone of transaction.

Refer_and_earn Entity
The entity records all invitations made by users and records if invited member joins and credits earned in wallet.

- re_id: Primary key
- wallet_id(Foreign key) References Wallet record entity
- invited_mobile_number: char(10) check(only digits allowed)
- new_join: bool (check’yes’/’no’), if invited no. joined PhonePe
- credit_earned (check if ‘new_join is yes’), earned credit value if invited mobile number joins.
- credit_earned_time (timestamp with timezone): Capture date,time and timezone of transaction.

Payee Entity:
The Payee entity records all information about payees corresponding to each user,like payee name,upi,mobile no,,bank account,amount send by user,any added comment,status if transaction success/fail and time of transaction occurring.

- transaction_id (Primary_Key)
- upi_id (Foreign_Key): References Users_profile table
- scanned_qr_code: (bytea): Store detail of scanned qr code
- payee_mobile_number: (check 10 digits) Payee mobile no. recorded
- payee_first_name
- payee_last_name
- payee_bank_account_number: (Foreign_Key): References Add_beneficiary table
- payee_upi_id (Foreign_Key) References Add_UPI_ID table
- payee_upi_number (Foreign_Key) References Add_UPI_Number table
- self_other_account (Foreign_Key) References Add_Self_other_A/C Number table
- amount_entered
- added_comment: Shows added comments.
- transaction_status: bool: If transaction success or failure
- transaction_time: The date/time when the transaction happened.

Add_Beneficiary Entity
If the user wants to send money in beneficiary bank account, beneficiary has to be added. Its details are recorded in the add_beneficiary entity.

- benf_id: Serial no.
- bank_name
- account_number(Primary key): Newly added a/c no.
- ifsc_code
- beneficiary_added_time: Time at which new beneficiary added for transaction

Add_UPI_ID_Entity
Any new upi id, user wishes to send money can be added, its detail recorded in add_upi_id entity.

- Added_upi_id :Serial no.
- Payee_upi_id: (Primary Key): Newly added upi id
- id_added_time: Time at which new upi id. was added

Add_UPI_Number_Entity
Any new upi number, user wishes to send money can be added, its detail recorded in add_upi_number entity.

- added_upi_number: Serial no.
- payee_upi_number (Primary Key): Newly added upi no.
- upi_number_added_time: Time at which new upi no. was added

Add_Self_Bank_Account_Entity
If the user wishes to send money to self, but in other bank account,its details recorded in add_self_bank_account entity.

- self_acc_id
- bank_name
- bank_account: Bank account number (Primary key)
- ifsc_code
- beneficiary_added_time: Time when beneficiary was added

Payer Entity
A user may receive money cashless manner in numerous ways. On receiving of money, the following information is recorded pertaining to each transaction.

- rec_id: Serial no.
- upi_id (Foreign key): References User_profile entity
- payer_first_name
- payer_last_name
- payer_upi_id: UPI id of payer
- amount_credit
- added_comment
- credit_time: Time when amount credited

Mobile_Recharge_Entity
A user may recharge any mobile number directly from PhonePe app.The following information is entered and recorded in mobile_recharge_entity.

- recharge_id (Primary key)
- upi_id (Foreign key) references user_profile entity.
- mobile_number_recharged – recharged mobile no.
- first_name
- last_name
- plan_tariff_amount
- transaction_time: Time of performing recharge

Fastag_purchase_Entity
A user may purchase FASTag from PhonePe app.The following information is entered and recorded in fastag_purchase_entity.

- recharge_id: Primary key
- upi_id: (Foreign key) References users_profile Entity
- vehicle_registration_number
- owner_id: Document name
- owner_id_number
- owner_first_name
- owner_last_name
- pan
- mobile_number
- amount
- transaction_time: Time of performing transaction

Dth_recharge_Entity
A user may recharge DTH(Direct to home) TV connection directly from PhonePe app.The following information is entered and recorded in dth_recharge_entity.

- recharge_id: Primary key
- upi_id(Foreign key): References users_profile Entity
- biller_name
- subscriber_id
- mobile_number: Linked to DTH

- monthly_auto_recharge(check ‘yes’/’no’)
- amount
- transaction_time

Electricity_recharge entity
A user may pay bills for any electricity connection directly from PhonePe app.The following information is entered and recorded in electricity_recharge_entity.

- recharge_id: Primary key
- upi_id(Foreign key): Reference to users_profile entity
- biller_name
- subscriber_id
- mobile_number
- monthly_auto_recharge(check ‘yes’,’no’)
- amount
- transaction_time: Time when recharge done

Cylinder_gas_booking entity
A user may book gas cylinder or pay for piped gas bill directly from PhonePe app.The following information is entered and recorded in Cylinder_gas_booking Entity.

- recharge_id: Primary key
- upi_id(Foreign key): Reference to users_profile entity
- biller_name
- subscriber_id
- mobile_number
- monthly_auto_recharge(check ‘yes’,’no’)
- Amount
- transaction_time: Time when recharge done

Water_bill entity
A user may pay bills for any water connection directly from PhonePe app.The following information is entered and recorded in water_bill_entity.

- recharge_id: primary key
- upi_id(Foreign key): Reference to users_profile entity
- biller_name
- subscriber_id
- mobile_number
- monthly_auto_recharge(check ‘yes’,’no’)
- amount
- transaction_time: Time when recharge done

Rent_payment entity
A user may pay rent for property directly from PhonePe app.The following information is entered and recorded in Rent_payment entity.

- rent_id: Primary key
- upi_id :(Foreign key): References users_profile entity
- property_name
- property_category
- amount

- monthly_auto_recharge
- transaction_time: Time when recharge done

Loan repayment entity

A user may pay loan installments directly from PhonePe app.The following information is entered and recorded in Loan_repayment entity.

- repayment_id:Primary key
- upi_id :(Foreign key): References users_profile entity
- loan_account_number
- loan_category: Category of loan
- amount
- monthly auto_repayment
- transaction_time: Time when recharge done

Insurance entity

A user may pay for insurance policy premiums directly from PhonePe app.The following information is entered and recorded in Insurance entity.

- insurance_id: Primary key
- upi_id :(Foreign key): References users_profile entity
- insurance_category(check 'Bike'/'Car'/'Health'/'Accident'/'Term'/'Travel'/'Life'/'Other')
- policy_number
- monthly_auto_repayment
- amount
- transaction_time: Time when recharge done

Travel entity

A user may pay rent for tickets for Flight'/'Train'/'Bus'/'Hotel' from PhonePe app.The following information is entered and recorded in Travel entity.

- travel_id: Primary key
- upi_id :(Foreign key): References users_profile entity
- travel_category(check 'Flight'/'Train'/'Bus'/'Hotel' /'Other')
- reservation_number
- Amount
- transaction_time: Time when recharge done

Education Fees entity

Users can pay education fees of institution directly from PhonePe app.The following detail are entered and recorded in Education_fees entity.

- fee_id: Primary key
- upi_id :(Foreign key): References users_profile entity
- institute_name
- institute_account_number
- amount
- transaction_time: Time when recharge done

Wealth_investments entity

A user can pay for investments of various types usng PhonePe app.The entered information is recorded in Wealth_investments entity.

- wealth_id

- upi_id :(Foreign key): References users_profile entity
- insurance_category(check ‘SIP’/’Stocks’/’Govt bonds’/’Private bonds’/’Funds’/’Others)
- depository_name
- customer_id
- investment_category
- monthly_auto_repayment
- amount
- transaction_time: Time when recharge done

Credit_cards entity
A user can pay for credit cards instalments directly using PhonePe app.The entered information is recorded in Credit_cards entity.

- credit_id
- upi_id :(Foreign key): References users_profile entity
- credit_card_number.
- month_validity(mm)
- year_validity(yy)
- cvv(3 DIGIT)
- amount
- monthly_auto_payment(check ‘Yes’/’No’)
- Transaction_time: Time when recharge done

Switch entity
Switch option let users to make payments using PhonePe by redirecting them to a partner app.This entity records all details regarding such transactions, like app name, id, subscription id, amount etc.

- s_id: Primary key
- upi_id(Foreign key): References users_profile entity
- app_name
- app_id
- subscription_id
- amount
- monthly_auto_payment
- transaction_time: Time when switch app booking done

Subscription_and_vouchers entity
Various subscriptions and vouchers like ott etc. can be availed directly from PhonePe app.This entity records information for all such transactions.

- s_id(primary key)
- upi_id(Foreign key): References users_profile entity
- subscription_voucher_name
- subscription_voucher_id
- amount
- transaction_time: Time when subscription taken

Rewards_record entity

Users win variety of rewards by transacting on PhonePe app.All details regarding such rewards is recorded in rewards_record entity.

- r_id
- upi_id(Foreign key): References to user_profiles entity
- reward_code: Primary key
- reward_amount
- reward_validity time : Time till reward is valid
- reward_issued_time: Time when reward was issued
- details: Details of rewards

Rewards_redeem entity
Users may redeem rewards they win, such details are recorded in this entity.

- rr_id
- reward_code
- reward_redeem_date: Date when reward is redeemed

Rewards_gifted entity
Users may gift some to other users of PhonePe, such details are recorded in this entity.

- rg_id
- reward_code
- reward_gifted_mobile_number: Reward gifted to which mobile number
- details
- reward_gifted_time: Time when reward is gifted

Relationships are:

1.Users creates Users_profile:

- Users on PhonePe create their account as user_profile. This Entity record all attributes of each user profile.
- Each profile has unique user id, user mobile no., bank name, upi id(as primary key), upi pin(used as 2nd factor authentication during transaction), debit card last 6 digits and date when profile is created.

2.Authentication enables User_profile:

- Each user on PhonePe must pass first factor authentication to enable their profile
- Any one of Pin/Pattern/Facial_feature/Fingerprint is saved and can be used to authenticate.

3.Users create their personal profile:

- Personal information of each user, corresponding to upi_id(users_profile) is stored in users_personal_profile entity.

- Users can provide information like first name,last name,email,address,gender,age,marital status,no.of family members.

4.Users create their financial_profile:

- Financial information of each user, corresponding to upi_id(users_profile) is stored in users_financial_profile entity.

- Users can provide information like annual income, house ownership,car,2-wheeler,insurance,investments,domestic and foreign travel frequency.

5.Users create wallet with PhonePe.

- Wallet_record entity stores wallet registration information for each user(upi_id).Information include pan,aadhaar,address_proof, which is needed for KYC.

6.Wallets are used for transaction:

- Wallet_transction entity stores each transaction information as debit, credit,net balance and transaction time.

- This can be queried to get wallet balance for any upi_id.

7.Amount earned by referring is credited in wallet:

- PhonePe(upi_id) users can invite other numbers to join PhonePe.
- If they join, certain amount is credited in user's wallet.
- Refer_and_earn entity stores details like referred mobile,who have joined,earned credit and time of earning credit.

8.Users(users_profile entity) send money to Payee

- PhonePe users (upi_id) can transfer money digitally in one of the following ways:-

1. By scanning QR code

2. Entering mobile no. of payee

3. Entering upi_id of payee

4. Entering upi no. of payee
5. Entering bank account details of payee/self.

- Comments can be added while performing transactions, and transaction status as success/failure is recorded.

9.Beneficiary/ UPI_ID/ UPI Number/ Self other bank accounts receive money as payee from the users.

- Beneficiary a/c no.,or upi id, or upi number is added to receive money.
- Self, other bank account can be added to receive money.

10.Users pay for mobile_recharge:

- Users can recharge any mobile number with any plan tariff.

11.Users pay for electricity_recharge:

- Users can pay for electricity bill using PhonePe.

12.Users pay for water_bill:

- Users can pay for water bill using PhonePe.

13.Users pay for cylinder/gas_booking:

- Users can pay for lpg cylinder booking using PhonePe.

14.Users pay for education fees:

- Users can pay education fees of institutes using PhonePe.

15.Users pay for travel:

- Users can pay for tracel needs like flights,hotels etc. using PhonePe.

16.Users repay outstanding loans using PhonePe:

- Users can repay their dues towards outstanding loans using PhonePe.

17.Users pay for investments in wealth products:

- Users can pay for investments in sip,mutual funds,bonds,stocks etc. using PhonePe.

18.Users pay for insurance products:

- Users can pay insurance policy premiums using PhonePe.

19.Users transfer money for rent_payments:

- Users can pay rents using PhonePe.

20.Users pay for dth recharge:

- Users can pay for dth recharge using PhonePe.

21.Users pay for fastag_purchase:

- Users can purchase Fastag using PhonePe.

22.Users pay for credit_cards dues:

- Users pay credit cards outstanding dues using PhonePe.

23.Users subscribe to various apps subscriptions and vouchers:

- Users can subscribe to various apps directly using PhonePe.

24.Users use Switch facility:

- Users avail switch facility to directly use 3rd party apps to avail services using PhonePe.

25.Users receive rewards:

- Users receive rewards upon transacting on PhonePe.

26.The received rewards are redeemed.

- Users can avail rewards by redeeming them.

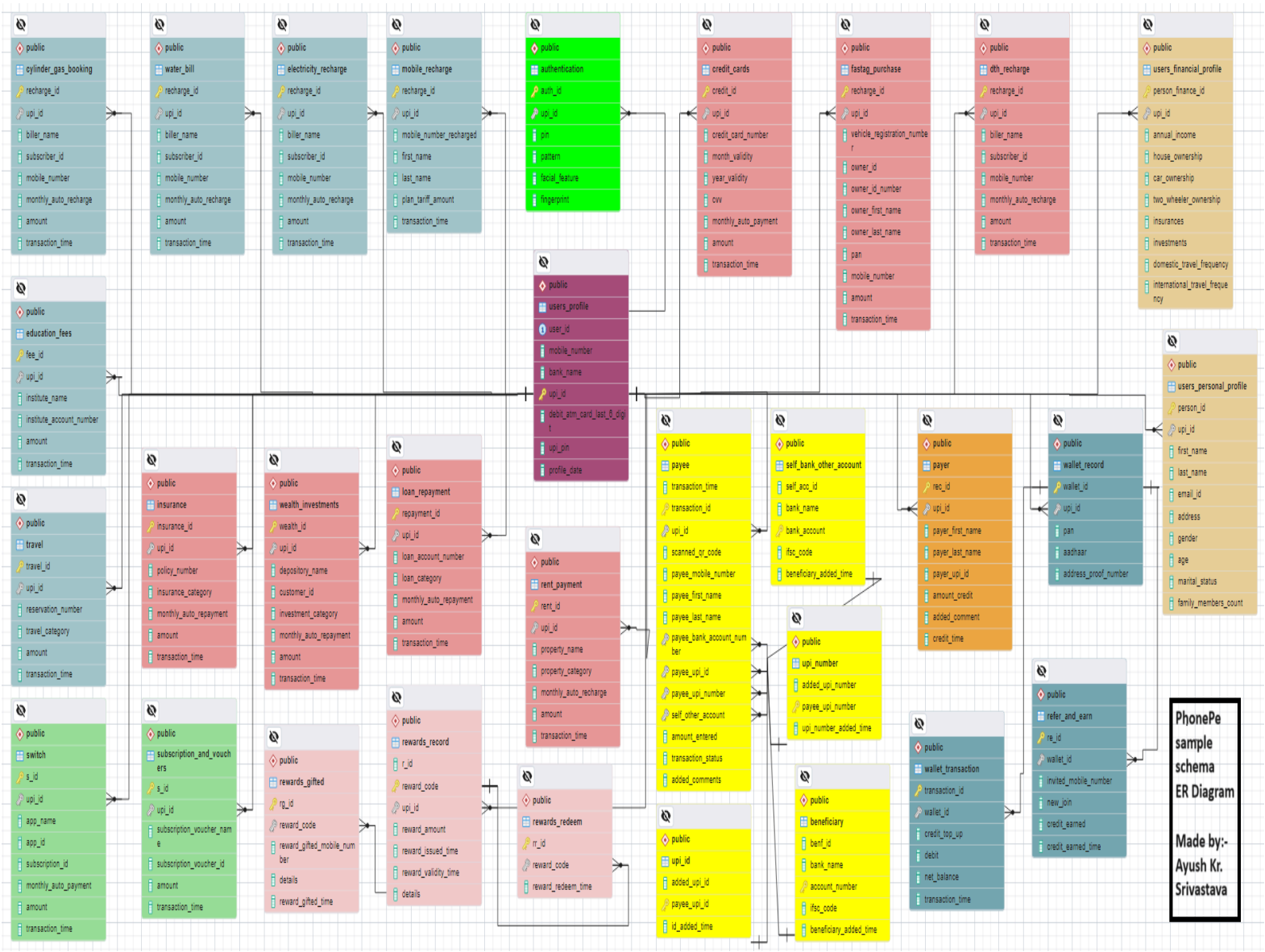
27.The received rewards are gifted.

- Users can gift rewards to other mobile numbers.

ER Diagram:

Let's construct an ER diagram that vividly portrays the relationships and attributes of the entities within the PhonePe schema. This ER diagram will serve as a visual representation, shedding light on the pivotal components of the PhonePe data model. By employing this diagram, you'll gain a clearer grasp of the intricate interactions and connections that define the platform's dynamics.

Conclusion



In this case study, we delved into the design of PhonePe schema and Entity-Relationship diagram. PhonePe has revolutionised the way people perform cashless transactions. The platform's intricate data model, forms the foundation for its seamless functionality. By understanding this schema, we gain insight into how PhonePe effectively manages the complexities of transactions, contributing to its widespread popularity and continued growth in the fintech world.