Paypal

Group# 3

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Project Description

a. Purpose

The purpose of paypal is to provide a secure and hassle free online platform for making monetary transactions. These transactions can be person-to-person or person-to-merchant. Users can link their bank accounts (credit/debit cards) to perform these transactions.

Transactions that does not involve a merchant/business will be free of cost. Business transaction will incur a surcharge on the amount received by the business. The platform also supports invoice generation and provides a rollback/refund functionality incase the transaction proves to be fraudulent or the user has decided otherwise.

b. Functionality

1. Accounts (account sign-up, login, deletion, couple account types)

2. Administrator (block accounts, verification processes)
3. Account Management (update personal details, add/remove credit cards)
4. Generate Summaries (history, transaction logs)
5. Person to Person Transaction (money transfer between accounts, invoicing)
6. Business Transaction (payment online at e-commerce stores, shipping, invoicing)
7. Refunds (time-limited refunds to any transaction incase of frauds)
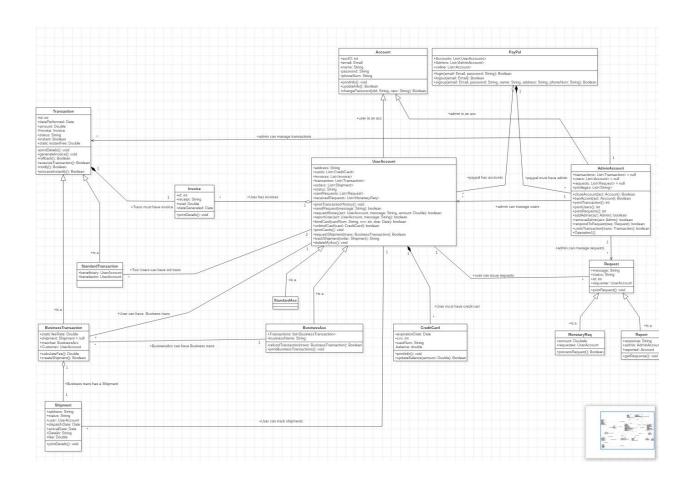8. Generate Requests (report to admin, request money from users)

c. Types of Users

Primarily there are two types of users of Paypal. Personal account holder and Merchant/Business account holder.

Personal account holder is a user who can use paypal for online e-commerce, sending and receiving funds through our secure channel, withdraw cash using paypal account. The user can also request funds from their friends, report fraudulent transactions etc.

A merchant is a user who can do everything a normal user can do with the addition of, linking their online shops (ebay, amazon, craigslist, personal web store), generating invoice for the customer upon checkout. Business accounts have a limit for how much funds they can transfer in one day. Business transactions will incur a 1% surcharge, the maximum fee charged on a transaction is $10.

Last type of user is the admin. The admin has issue resolution powers. He/she can review all transactions. Ban an account from performing transactions if they have been reported for fraudulent activity. Admins can reroll transactions as well.
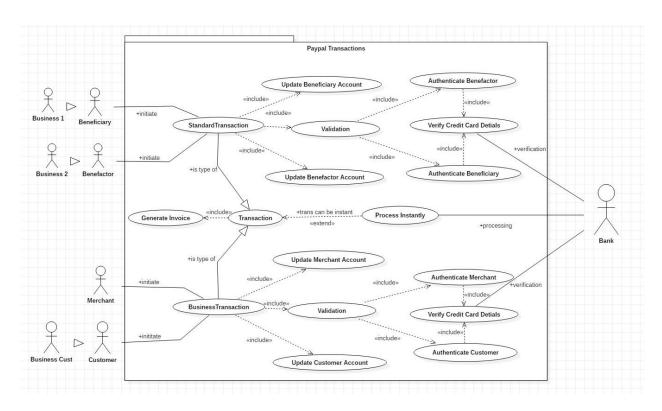
d. Class Diagram:

Account
+accID: int
+email: Email
+name: String
-password: String
+phoneNum: String
+printInfo(): void
+updateInfo(): Boolean
+changePassword(old: String, new: String): Boolean

PayPal
+Accounts: List<UserAccounts>
+Admins: List<AdminAccount>
+online: List<Account>
+login(email: Email, password: String): Boolean
+logout(email: Email): Boolean
+signup(email: Email, password: String, name: String, address: String, phoneNum: String): Boolean

Transaction
+id: int
+datePerformed: Date
+amount: Double
+Invoice: Invoice
+status: String
+instant: Boolean
+static instantFee: Double
+printDetails(): void
+generateInvoice(): void
+rollback(): Boolean
+executeTransaction(): Boolean
+notify(): Boolean
+processInstantly(): Boolean

UserAccount
+address: String
+cards: List<CreditCard>
+invoices: List<Invoice>
+transaction: List<Transaction>
+orders: List<Shipment>
+status: String
+sentRequests: List<Request>
+receivedRequests: List<MonetaryReq>
+printTransactionHistory(): void
+sendRequest(message: String): boolean
+requestMoney(act: UserAccount, message: String, amount: Double): boolean
+reportUser(act: UserAccount, message: String): boolean
+bindCard(cardNum: String, cvv: int, doe: Date): boolean
+unbindCard(card: CreditCard): boolean
+printCards(): void
+requestShipment(trans: BusinessTransaction): Boolean
+trackShipment(order: Shipment): String
+deleteMyAcc(): void

AdminAccount
+transactions: List<Transaction> = null
+users: List<Account> = null
+requests: List<Request> = null
+privileges: List<String>
+closeAccount(act: Account): Boolean
+banAccount(act: Account): Boolean
+printTransaction(): int
+printUsers(): int
+printRequests(): int
+addAdmin(act: Admin): boolean
+removeAdmin(act: Admin): boolean
+respondToRequest(req: Request): boolean
+undoTransaction(trans: Transaction): boolean
+Operation1()

Invoice
+id: int
+receipt: String
+total: Double
+dateGenerated: Date
+printDetails(): void

StandardTransaction
+beneficiary: UserAccount
+benefactor: UserAccount

StandardAcc

Request
+message: String
+status: String
+id: int
+requester: UserAccount
+printRequest(): void

BusinessTransaction
+static feeRate: Double
+shipment: Shipment = null
+merchat: BusinessAcc
+Customer: UserAccount
+calculateFee(): Double
+createShipment(): Boolean

BusinessAcc
+Transactions: list<BusinessTransaction>
+businessName: String
+refundTransaction(trans: BusinessTransaction): Boolean
+printBusinessTransactions(): void

CreditCard
+expirationDate: Date
+cvv: int
+cardNum: String
-balance: double
+printInfo(): void
+updateBalance(amount: Double): Boolean

MonetaryReq
+amount: Doubela
+requestee: UserAccount
+processRequest(): Boolean

Report
+response: String
+admin: AdminAccount
+reported: Account
+getResponse(): void

Shipment
+address: String
+status: String
+user: UserAccount
+dispatchDate: Date
+arrivalDate: Date
+Details: String
+fee: Double
+printDetails(): void

+user is an acc
+admin is an acc
+admin can manage transactions
+paypal has accounts
+paypal must have admin
+admin can manage users
+admin can manage requests
+Trans must have invoice
+User has invoices
+user can issue requests
+Two Users can have std trans
+is a
+is a
+is a
+User can have Business trans
+BusinessAcc can have Business trans
+User must have credit cart
+is a
+is a
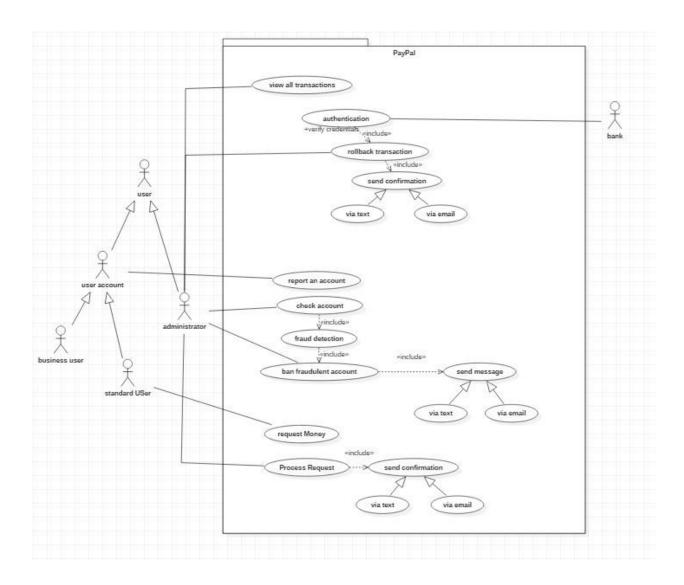+Business trans has a Shipment
+User can track shipments

Use Cases:

1. Account Login/SignUp.

2. Account Details Updating.

3. Bind/UnBind Credit Cards.

4. Standard Transaction.

5. Instant Transaction.

6. Business Transaction.

7. Shipping Products.

8. Banning Fraudulent Accounts.

9. Get transaction logs/history.

10. Get Invoice for payments.

11. User Request to Another User.

12. User Request/Report to Admin.

13. Refund Fraudulent Transaction.

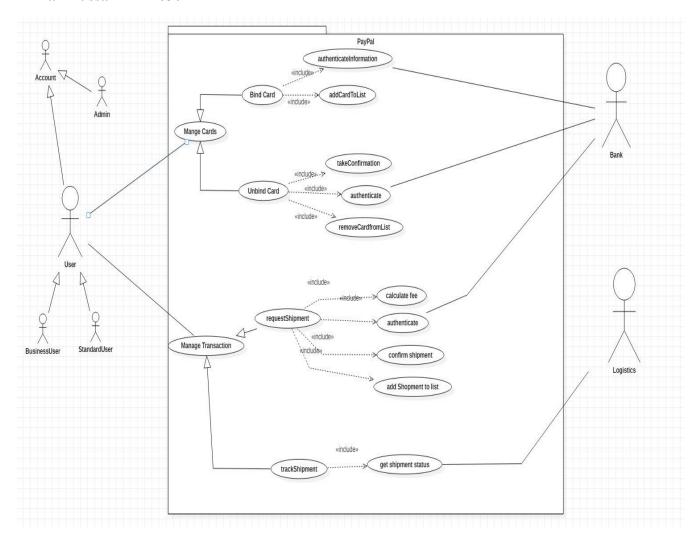14. User's shipment tracking.

15. Close down User account.

Use Case Diagrams:

Muhammad Wasiq 17L-6315
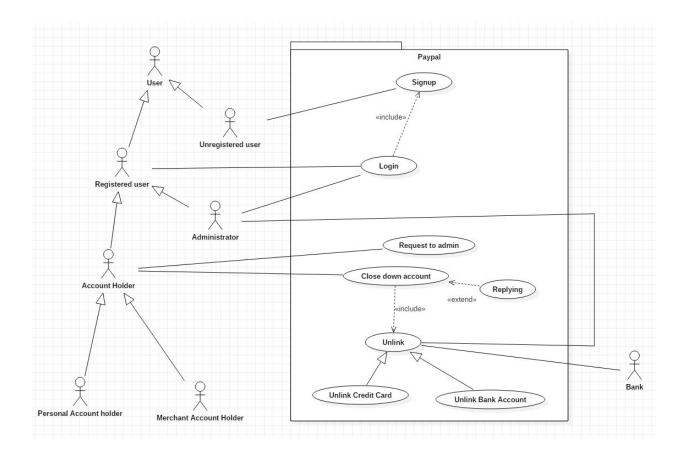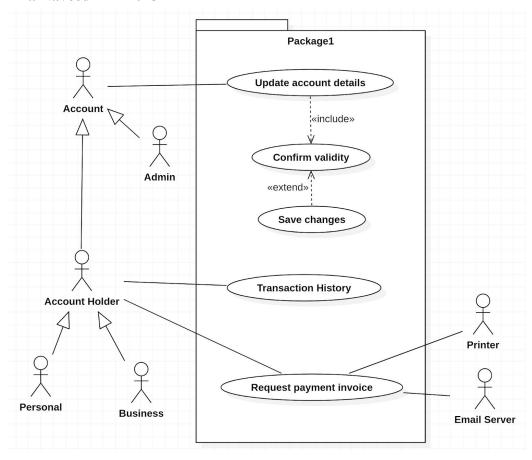
Uswa Mahmood 17L-4039

Khizar Hussain 17L-6304

Abubakr Munir 17L-4545

Aiza Naveed 17L-4045

Package1

Account

Admin

Account Holder

Personal

Business

Update account details

«include»

Confirm validity

«extend»

Save changes

Transaction History

Request payment invoice

Printer

Email Server

Use Case Description:

Abubakar Munir 17L-4545

USE CASE : Login

Summary: System grants access of an account and its specified functions, to a user when user enters correct credentials which match with the ones of that account.

Actors: A user who is just a visitor up till now.

Preconditions:

1)   User has signed up(I.e user has an existing account).

2)   User has entered a username and password.

Description: Initially system waits for user to enter login Id and password. After this step, the user presses the login button. User gets logged in to the system and existing account of that user along with all its system specific functionalities (which may vary depending on account type) becomes accessible to the user.

Exceptions:

Incorrect user ID or password: If any such account with the entered combination of user ID and password does not exist, then a message is displayed that "Some of your info isn't correct. Please try again."

Post Conditions: User is logged in to his/her account and can use all the functionalities of system which are specified for that user.

Abubakar Munir 17L-4545
USE CASE 2: Signup

Summary: A user who wants to create an account provides a set of information to system. System saves the provided information and a new account is created.

Actors: A user who is just a visitor in this use case.

Preconditions:

1)   User is not logged in to the system.

Description: Initially system waits for user to enter all the required information. This information includes a unique login ID with reference to the ones already stored in database and a password. In addition to these, a number of other fields is supposed to be filled by user here to provide data such as Name, bank account number and Card details etc. After this step, the user presses the signup button. System stores all the information in an existing database if all of the information provided by the user is valid.

Exceptions:

Invalid Info: If any of the information provided by the user is invalid, after pressing signup button it would not be added to the database and a message will be displayed indicating the field which has invalid data.

Post Conditions: A new user account is created so now it can be used and its specified functionalities can be accessed.

Abubakar Munir 17L-4545

USE CASE 3: User Request/Report to admin

Summary: A user who is logged in to the system types a request or reports to admin and submits it.

Actors: A user who is requesting/reporting can be a

1)   Personal account holder

2)   Merchant's account holder

Preconditions:

> 1) User has already logged in to the system (as user cannot request or report to admin anonymously in this system).

Description: If user is logged into the system, a request/report button is visible to the user. On pressing that button user is directed to another page which has a description box. User can type their request or report to admin about any scam. Upon pressing the submit button, It will be stored in our database.

Exceptions: No exceptions.

Post Conditions: A new request/report is registered.

Abubakar Munir 17L-4545

USE CASE 4: Close down user account

Summary: A user account is deleted if the user chooses to close down the account.

Actors:

1)   A user who is closing down the user account can be a

        a)   Personal account holder

        b)   Merchant's account holder

2)   Administrator

Preconditions:

1)   If a user is attempting to close down a user account, that user must be logged in to the system.

Description: User chooses to close down account. On pressing the close account button, user is directed to another page. User has to answer the question that "Why do you want to close down your account?". There is a description box below to answer that question. There is a close account button at the bottom of this page too. User can press that button without replying or after answering the question. In either of the cases a request is submitted to admin to close account of that user. When admin views the request he/she checks if user has any dues remaining and if user has no payments due,admin unlinks that paypal account from its bank account or credit card. In the next step, admin deletes the account.

Exceptions:

Dues Remaining: If user has any dues remaining which are supposed to be transferred to another account, a message is displayed that "You cannot close down your account as you have some dues remaining" and user account is not deleted.

Post Conditions: User's account is deleted.

Aiza Naveed 17L-4045

USE CASE 1: Account Details Updating

Summary:

A registered user wishes to change one or more details of their PayPal account.

Actors:

      1)   User

Preconditions:

      1)   User has logged into their account.

Description:

A user may update their account information, such as a change in bank account number, email address, password, etc…

Exceptions:

Incorrect or invalid information – If a change is made which renders the information invalid then an error message will be displayed and no change will be made to the information.

Post Conditions:

      The changed information will be the default information. The old information will be "deleted" and not valid any more.

Aiza Naveed 17L-4045
USE CASE 2: Get transaction logs/history

Summary:

A registered user wishes to view their entire previous transactions log, which include all details regarding action to and from their account.

Actors:

        1) User

Preconditions:

        1)   User has logged into their account.

        2)   User has had at least one transaction in history.

Description:

A user may view all details regarding all previous transactions made from or to their account.

Exceptions:

       No previous transaction – If no transactions regarding a specific account are found then the message, "You made no transaction in this time span" will be displayed.

Post Conditions:

       There are no post conditions to this use case.

Aiza Naveed 17L-4045
USE CASE 3: Get Invoice for payments

Summary:

A registered user, after making a payment, may request to get an invoice. They further have two options: they may print the invoice or have it emailed it to them.

Actors:

    1)   User

    Secondary Actors:

        1)   Printer

        2)   Email Server

Preconditions:

    1)   User has logged into their account.

    2)   User has made a payment.

Description:

After making a payment, a user may request to get an invoice. The user may further choose if they wish to print the invoice right away or have it emailed to them to the email address linked to their PayPal account.

Exceptions:

    There are no exceptions to this use case.

Post Conditions:

    There are no post conditions to this use case.

L17-6304   Khizar Hussain

USE CASE: Bind / Unbind Cards

Summary:

A user, standard or Business user, can add and remove his/her credit cards

Actors:

1) User

Preconditions:

      1)   User has logged into their account.

Description:

The user can bind or add a credit card using the bindCard function. The function will take user's card's credentials and authenticate the data with the card provider. If the authentication passes, the card will be added to the user's card list. In similar fashion, a user can remove his/her card from the list. Upon removal, the user will be prompted to authenticate their identity, if authentication passes the card will be removed from the list.

Exceptions:

EmptyListException: this exception can occur if the user forcefully tries to remove a card from the list even when the list is empty.

Post Conditions:

     User's card list will be updated. A card will be added or removed.

17L-6304 Khizar Hussain

USE CASE: Request Shipment

Summary:

A user can request to get his order delivered if the business transaction consists of tangible items that need to be delivered.

Actors:

1) User

Preconditions:

1) User has logged into their account.

2) User has made a business transaction that contains a deliverable.

3) User has enough balance in at least one of their cards to afford the shipping fee.

Description:

A business transaction can consist of a deliverable or a set of deliverables that can be shipped to the buyer. If the buyer requests for a shipment, a shipment object will be created and linked to said business transaction. The shipment object will contain the delivery address and a fee shall be charged using the rate specified. The shipment item will also be added to the user's list of shipments.

Exceptions:

None identified.

Post Conditions:

a. User's bank balance will decrease.
b. Shipment item will be added to the user's list.
c. User will be notified about shipment eta.
d. User can browse a list of shipments.

17L-6304 Khizar Hussain
USE CASE: Track shipment

Summary:

A user can track their shipment's location and get an estimated time of arrival.

Actors:

1) User

Preconditions:

1. User is logged into their account.
2. User has business transactions that may contain shipments.
3. User has requested for at least one shipment.

Description:

User's can request for shipments which will then appear in their list of shipments. For a given shipment that has yet to be delivered, a user can inquire its status, location, estimated time of arrival (i.e. essential tracking features).

Exceptions:

ConnectionError: the courier's server cannot be contacted to provide real time information.

Post Conditions:

None applicable.

L17-6315   Muhammad Wasiq

USE CASE : Instant Transaction

Summary:

User can choose any of his transaction be processed instantly but this service will be charged.

Actors:

1) User

2) Bank

Preconditions:

      1)   User initiating transaction is logged into system.

      2)   Any type of transaction has been initiated

      3)   Verification processes of the given transaction have been done.

Description:

After the user has begun a transaction and all verifications of user account and beneficiary's account are done, the user is given a choice to either execute the transaction and have it completed instantly or wait a certain number of business days for the bank to eventually process the transaction over at the bank's system.
If user decides to go with this option, bank will prioritize the transaction and will charge a bit extra from the user. After this the consequent activities of the chosen (standard or business) transaction will continue

Exceptions:

Request to bank servers for instant transaction fails.

Post Conditions:

    Transaction completion process will resume.

L17-6315 **Muhammad Wasiq**

USE CASE : Business Transaction

Summary:

A customer can pay for his online orders by making a business transaction with the business he is ordering his products with.

Actors:

1) Customer

2) Business

Preconditions:

1) Customer is logged into the system.

2) Both Accounts have at least one credit card linked

Description:

Customer can either be another business or a regular user. The beneficiary in this case will always be a business which is being paid money for the customer's order.
When the transaction is initiated, all credentials of both accounts are verified before the User is asked for instant processing. After execution of the transaction, if it was successful an invoice would be generated. The customer will be given the choice to ship their order using paypal services if he so desires. In such a case, shipment information is generated and all relevant notifications are sent to the customer's account upon transaction completion.

Exceptions:

Customer has insufficient balance.
Business' account is banned.
Transaction was interrupted/failed.

Post Conditions:

The required amount in the transaction will be added to Benefactors account and subtracted from the Beneficiary's account.

L17-6315   Muhammad Wasiq

USE CASE : Standard Transaction

Summary:

It is a transfer of money between two user accounts of the same type.

Actors:

1) Beneficiary

2) Benefactor

Preconditions:

1)   Beneficiary is logged into the system.

2)   Both Accounts have at least one credit card linked

Description:

A business can transfer money to other businesses and a normal user can transfer money to other users. When the transaction is initiated, all credentials of both accounts are verified before the User is asked for instant processing. After execution of the transaction, if it was successful an invoice would be generated and notifications to both accounts would be sent regarding the outcome of the transaction.

Exceptions:

Beneficiary has insufficient balance.
Benefactor's account is banned.
Transaction was interrupted/failed.

Post Conditions:

The required amount in the transaction will be added to Benefactors account and subtracted from the Beneficiary's account.

17L-4039   Uswa Mahmood

USE CASE : Refund Fraudulent Transaction

Summary:

If there is any error/issue in the transaction made by standard user, admin will refund such fraudulent Transactions.

Actors:

1. Administrator

Secondary Actors:

1. Bank

Preconditions:

      1)   User has made a transaction.

      2) Admin has logged into his account.

Description:

All transactions are subject to review and could be delayed or stopped if admins identify an issue. Admins view all the transaction history and look for any fraudulent transaction. If admin finds any such transaction, admin will rollback the transaction and notify the user via text on phone or an email.

Exceptions:

    no exception

Post Conditions:

transaction will be stopped and both account states remain unchanged.

17L-4039   Uswa Mahmood
USE CASE : Request Money

Summary:

A personal account user can request money from another personal account.

Actors:

> **1)** Requestee (standard user)

> **2)** Requester (standard user)

Preconditions:

> 1)   Requester must logged into his account.

> 2)   Requestee must have an account.

Description:

a personal account holder can request money from another user. Requestee will either accept or cancel the request. If requestee accepts the request then the requested amount is transferred to the requesters account and the requester will be notified and can quickly access the transferred money. If requestee cancels the request then requester will get notified.

Exceptions:

Resquestee account is banned.

Post Conditions:

Requested money transferred to the requester account.

17L-4039   Uswa Mahmood
USE CASE : Ban Fraudulent Accounts

Summary:

admin can ban any fraudulent account.

Actors:

1) Administrator

2) User

Preconditions:

1)   User account must exist.

2)   Administrator must logged into his account.

Description:

User can report other users and admins monitor and track all the transactions and accounts. Admin will then check an account for fraud detection. If the account is fraudulent then admin will ban it and notify the banned user.

Exceptions:

no exception
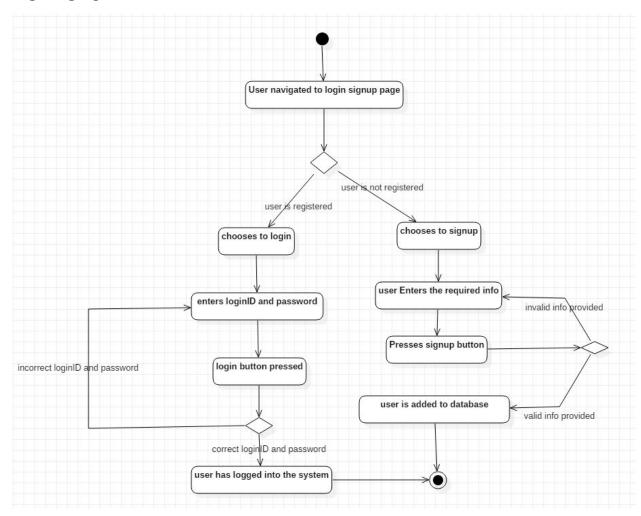
Post Conditions:

Admin will notify the banned user.
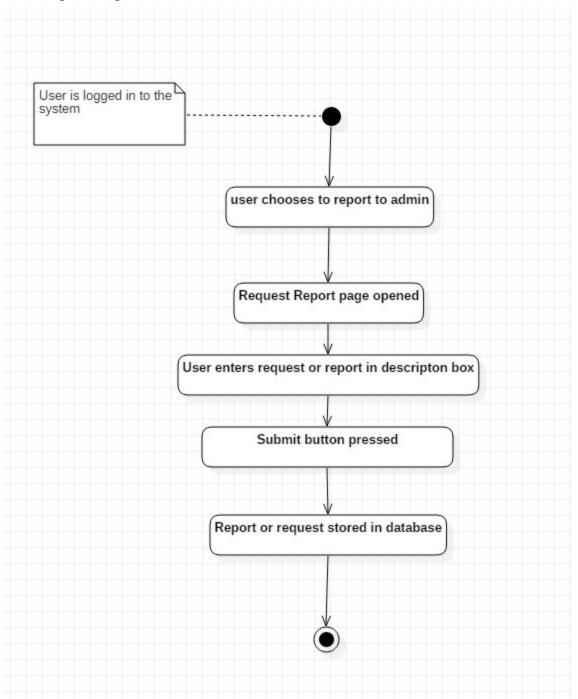
Activity Diagrams:

Abubakar Munir 17L-4545
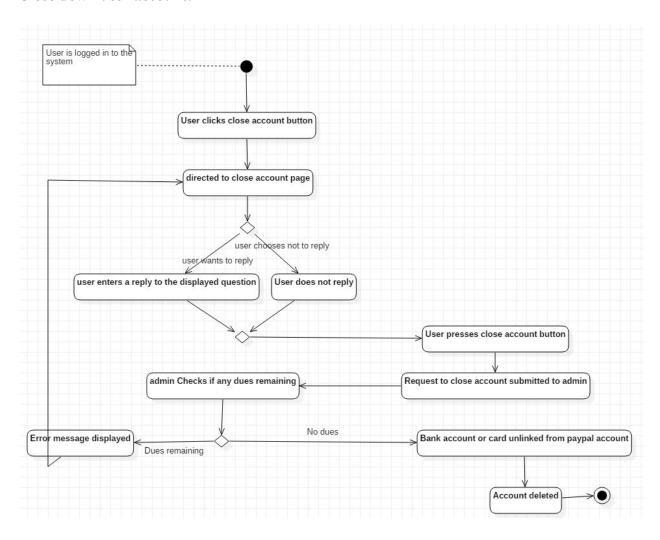
Login/Signup User:
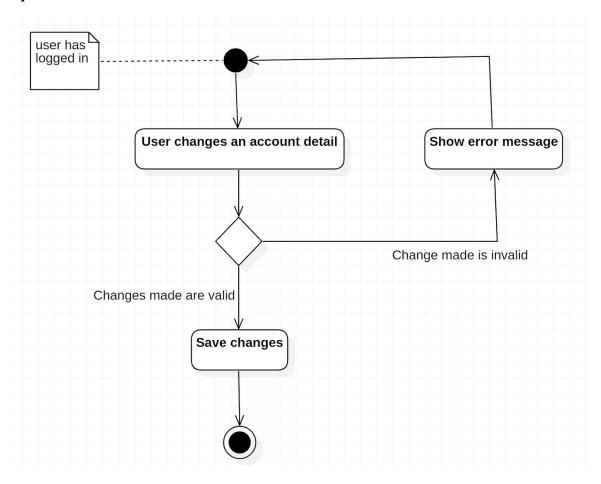
Abubakar Munir 17L-4545
User Request/Report to an Admin:
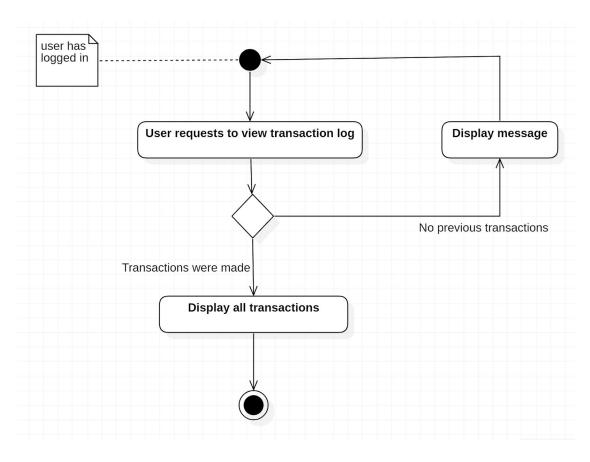
Abubakar Munir 17L-4545
Close down user account:

Aiza Naveed 17L-4045
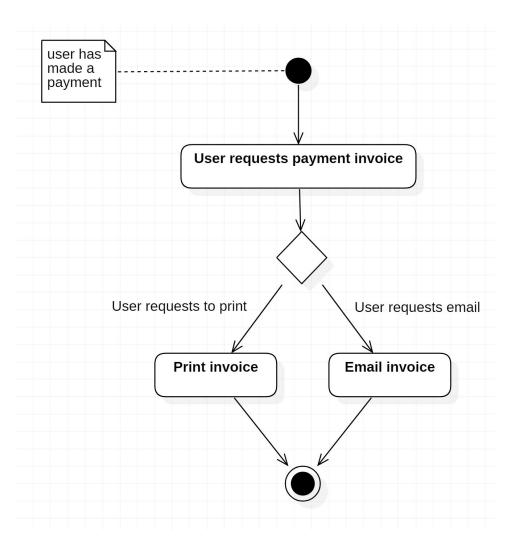
Update User Account Details:
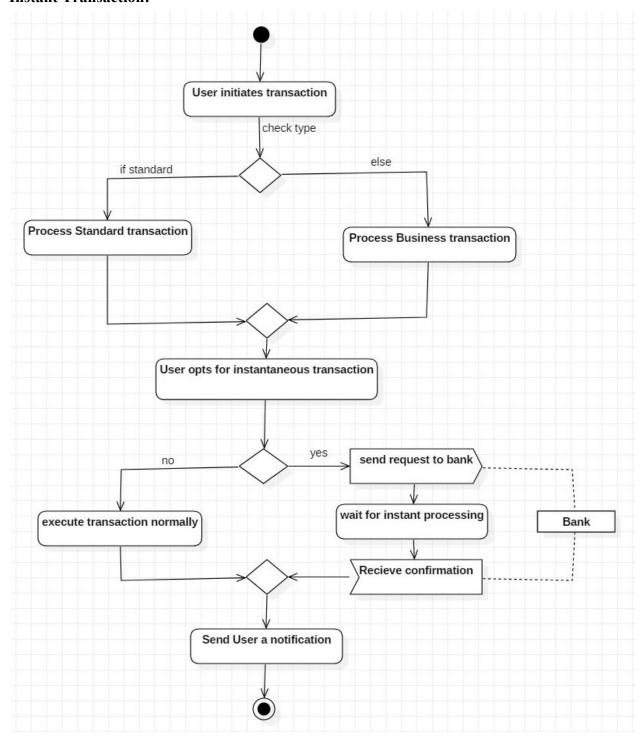
Aiza Naveed 17L-4045

User's Transaction History:

user has logged in

User requests to view transaction log

Display message

No previous transactions

Transactions were made

Display all transactions
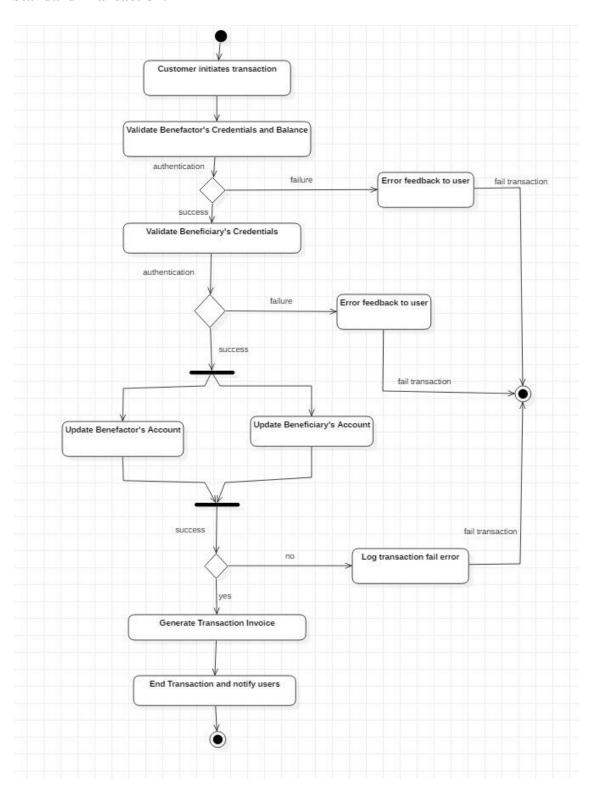
Aiza Naveed 17L-4045
Transaction Invoices:
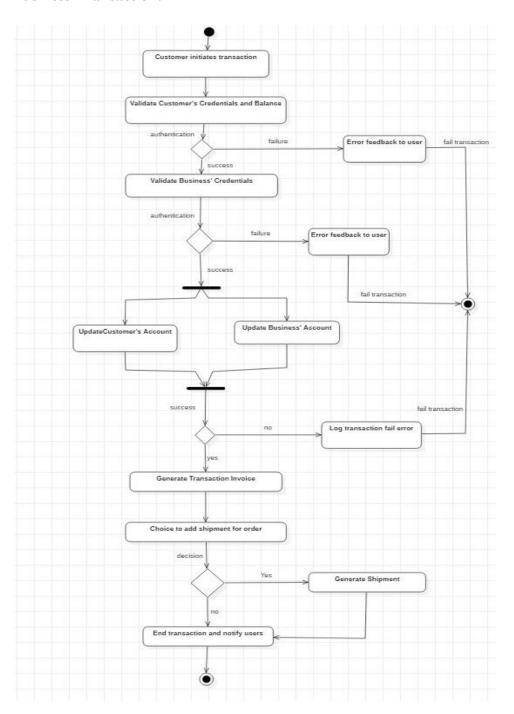
L17-6315   Muhammad Wasiq
Instant Transaction:

L17-6315   Muhammad Wasiq
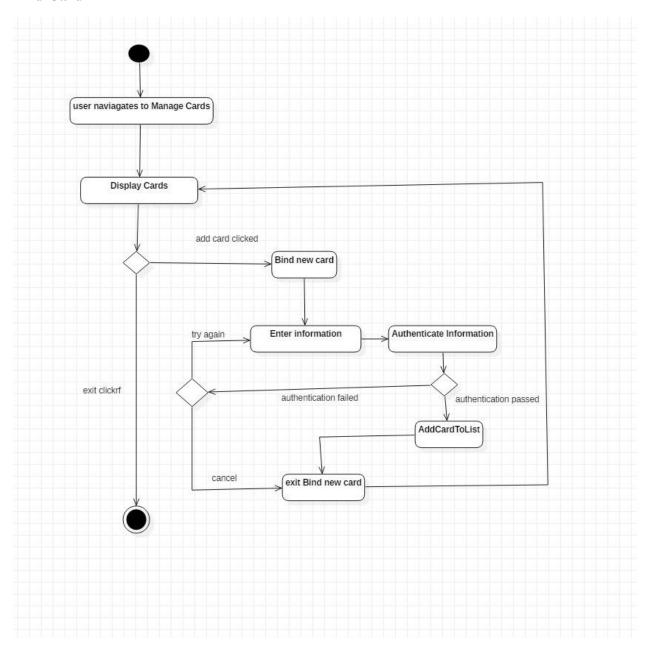
Standard Transaction:
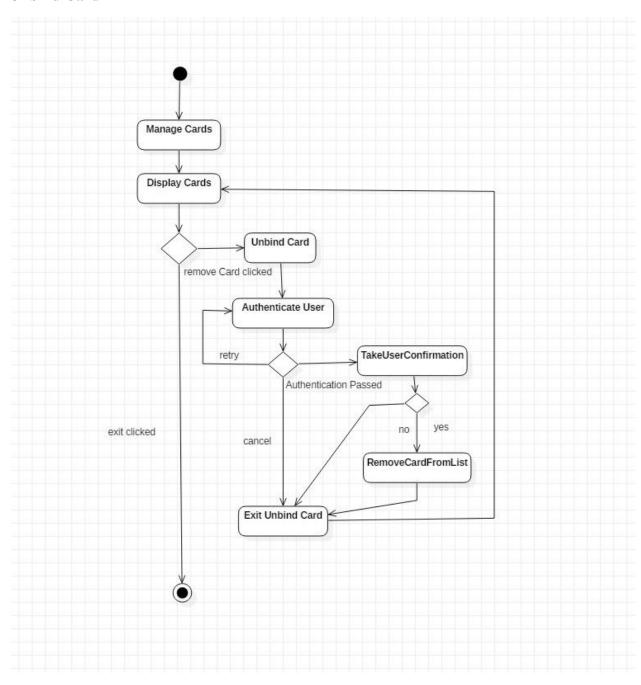
L17-6315   Muhammad Wasiq
Business Transaction:

Khizar Hussain   17L-6304

1. **Bind Card**

Khizar Hussain   17L-6304

2. Unbind Card

Khizar Hussain   17L-6304
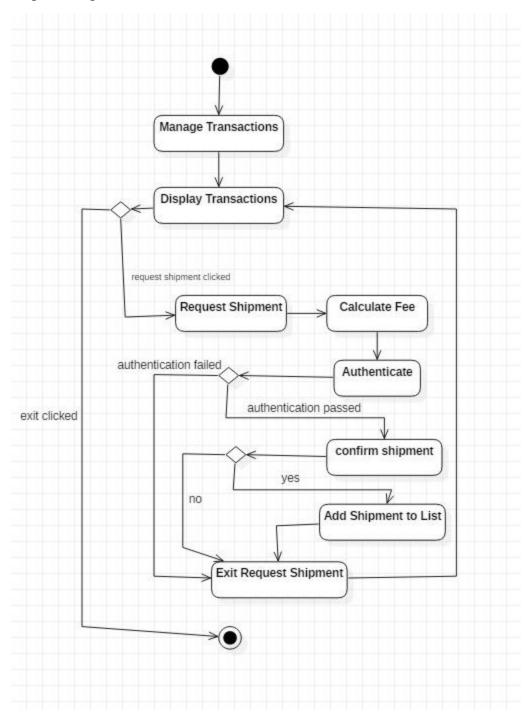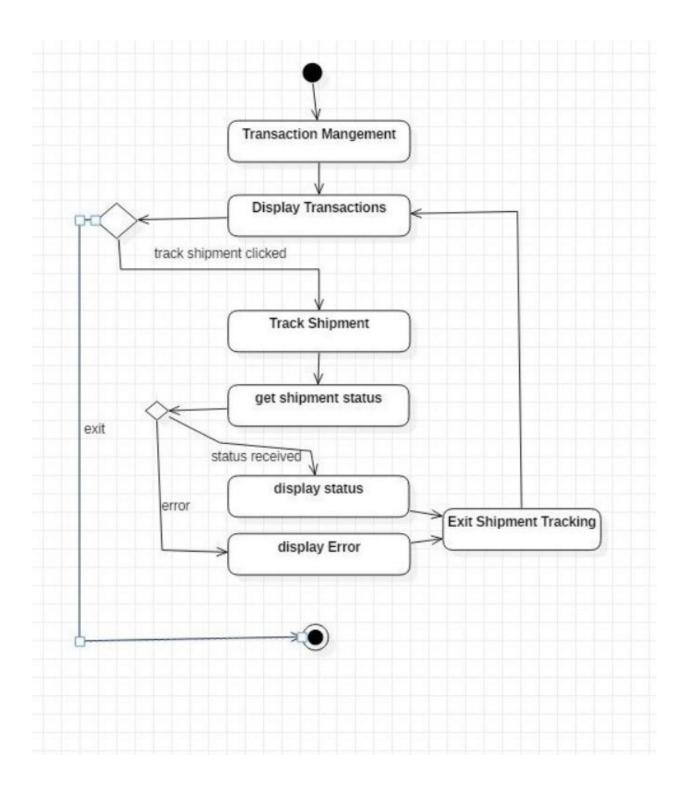
3. **Request Shipment**

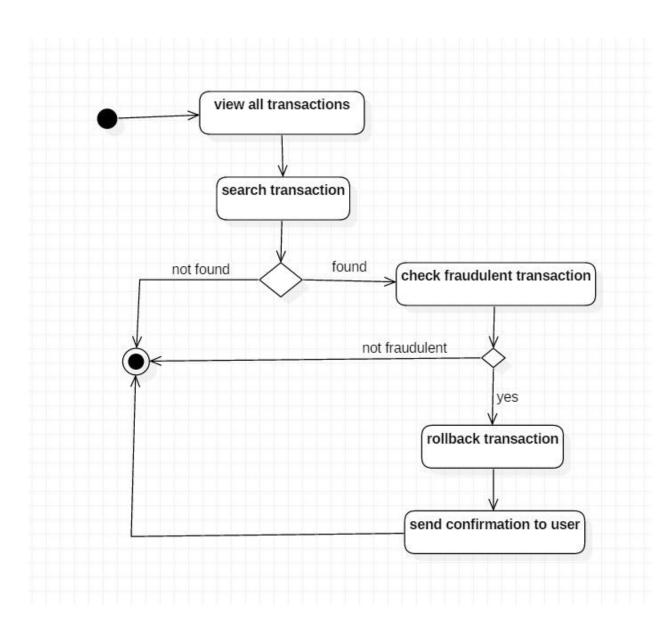**Khizar Hussain   17L-6304**

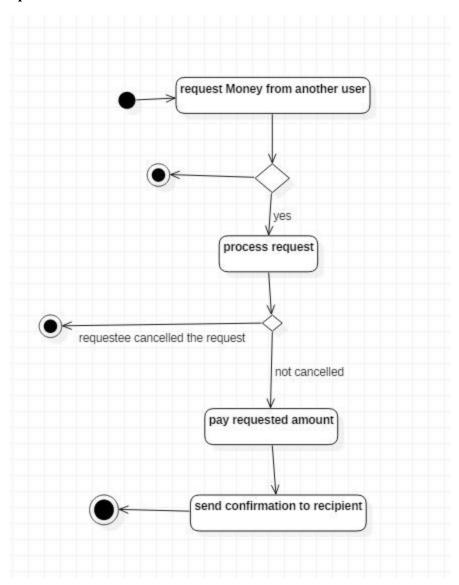4. **Track Shipment**

L17-4039   Uswa Mamood

Refund Fraudulent Transaction:

L17-4039 Uswa Mahmood

User Request to another User:

L17-4039   Uswa Mahmood

Ban Fraudulent Accounts: