Group 15

E-WALLET

Software Requirements Specification

Ver. 1.0

<<Annotated Version>>

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e-Wallet System

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# 1.0. Introduction

Many wallets today are cluttered with several cards, cash and more. Keeping track of all these items can be difficult. The electronic wallet (e-Wallet) will provide all of the functions of today’s wallet on one convenient smart card eliminating the need for several cards. The e-Wallet will also provide numerous security features not available to regular wallet carriers. The items proposed in this chapter will give detailed descriptions of how to design this e-Wallet system.

## 1.1. Purpose

The purpose of this document is to present a detailed description of the BITS e-Wallet System. The electronic wallet (e-Wallet) will provide all of the functions of today’s wallet on one convenient smart card eliminating the need for several cards. The items proposed in this chapter will give detailed descriptions of how to design this e-Wallet system.

It will explain the purpose and features of the system, the interfaces of the system, what the system will do, the constraints under which it must operate and how the system will react to external stimuli.

***1.2. Scope of Project***

This software system will be an e-wallet System for BITS-Pilani K.K. Birla Goa Campus. This system will be designed to implement the idea of a cashless campus, and make it easier for the students to purchase stuff from different sellers inside the campus.

***1.3 References***

*Object Oriented Design & Patterns, Cay Horstmann, John Wiley & Sons, 2004.*

*UML Distilled, Martin Fowler with Kendall Scott, Pearson Education, 2nd Edition, 2000.*

***1.4 Overview of document:***

This document provides the use case model and documentation for an electronic wallet (e-Wallet) with the use of smart card technology. It will provide a use case model overview that will include several subsystem diagrams, a description of each subsystem, use case models for each subsystem and actors specific to each of these subsystems. It also contains definitions for various terms for the system followed by a summary.

# 2.0. Overall Description

## 

## 2.1 System Environment

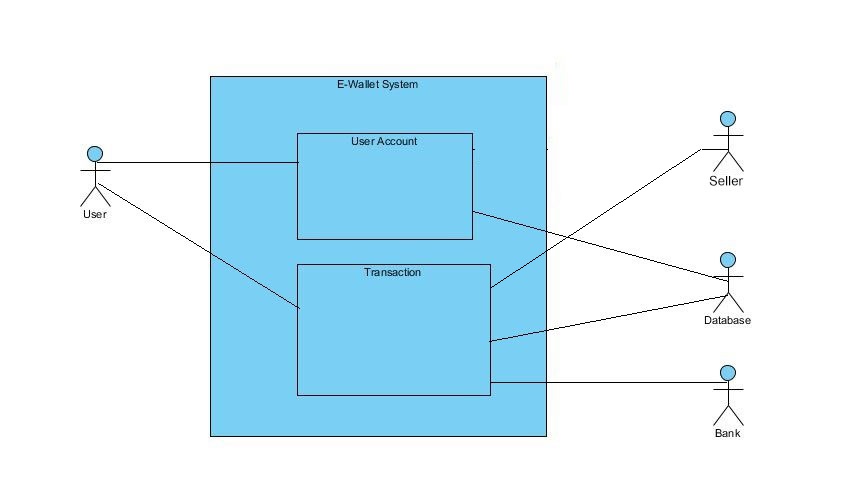


Figure 1 - System Environment

The e-wallet has five active actors and one cooperating system.

The user logs in to e-wallet and attempts to make payment. Admin takes care of the log in and database stores the transaction history. The seller receives the payment. The bank will transfer money through the cards.

## 2.2 Functional Requirements Specification

This section outlines the use cases for each of the active actors separately.

## 2.2.1 User Use Cases

## Use case: Login/Signup

**Diagram:**

User

Login/Signup

**Brief Description:**

The user signs up on e-wallet if he does not have an account already. Then he can login to make payments.

**Initial Step-By-Step Description:**

1. The user opens the app.

2. The user signs up on e-Wallet (if no account already).

3. The user gets login information using email. (if no account already).

4. The user logs in for the first time and change the password. (if no account already)

5. The user logs to e-Wallet whenever he wants to make a payment/ check transaction history/ send gift cards.

**XRef: Sec 3.2.1**

## Use Case: Edit Personal Details

**Diagram:**

User

Edit Personal Details

# Brief Description:

##### The user can edit his personal details of his e-wallet account using simple step-by-step instructions.

## Step by Step Description:

##### 1. The user logs in to his e-wallet account.

##### 2. The user clicks on Edit/Change Personal Details option tab.

3. The user make required changes.

4. The user submit changes.

5. The database updates itself and send a confirmation email to the user.

**XRef: Sec 3.2.3**

## Use Case: Add money to Wallet

**Diagram:**

User

Add money to wallet

## Brief Description:

##### The user adds value/virtual money to his e-Wallet.

## Step by Step Description:

##### 1. The user logs in to the e-wallet.

##### 2. The user clicks on the option Add Money.

##### 3. The user selects the option of crediting via Debit Card/ Credit Card/ Net Banking.

4. The bank opens up a portal to put balance in the Wallet.

5. A confirmation email is sent to the user.

**XRef: Sec. 3.2.4, Sec. 3.2.5**

## Use Case: Purchase/Send Gift Cards

**Diagram:**

User

Purchase/Send Gift Cards

## Brief Description:

##### The User can purchase and send gift cards to his/her friends.

## Step by Step Description:

##### 1. The user logs in to the e-wallet.

##### 2. The user clicks on Purchase Gift Cards and choose among the Gift Card amounts.

3. The user clicks on Send Gift Card and select the person he wants to send the Gift Card (the other person must also have an e-Wallet)

4. The user receive confirmation email.

**XRef: Sec. 3.2.4, Sec. 3.2.5**

## Use Case: Use Gift Cards

**Diagram:**

User

Use Gift Cards

## Brief Description:

##### The user can use the Gift Cards he/she has.

## Step by Step Description:

##### 1. The user logs in to the e-wallet.

##### 2. While making any payment the user gets an option to pay using gift card.

**XRef: Sec. 3.2.4, Sec. 3.2.5**

## Use Case: Make Payment

## Diagram:

User

Make Payment

# Brief Description:

##### The user can use the money (virtual) from his e-wallet to make payments to the seller.

# Step by Step Description:

##### 1. The user logs into his e-wallet.

##### 2. The user selects the option Make Payment.

3. The user then proceed by using Normal Payment/Avail Offers/ Use Gift Card.

4. The required amount gets deducted from the user’s wallet and is added to the seller’s account/ wallet.

5. The bank and the database authenticates the transaction.

6. The user and seller gets a confirmation mail from the system.

**XRef: Sec. 3.2.8**

## Use Case: View Transaction History

**Diagram:**

User

View Transaction History

# Brief Description:

##### The user can get details of any/all of his previous transactions.

# Step by Step Description:

##### 1. The user logs in to e-wallet.

##### 2. The user clicks on the option View Transaction History.

3. The database returns the history.

**XRef: Sec. 3.2.6**

### ***2.2.2 Seller Use Cases***

#### **Use case: Make Payments**

**Diagram:**

Database

Make Payments

**Brief Description:**

The seller gets money in his/her wallet/account in exchange of goods and services he/she provides.

**Initial Step-By-Step Description**

1. The seller provides a platform where user login into his/her account.

2. The user make a purchase and transfer fund via transfer portal.

**XRef: Sec. 3.2.1**

### ***2.2.3 Database Use Cases***

#### **Use case: Signup/Login**

**Diagram:**

Database

Signup/Login

**Brief Description:**

When a new user want to have an e wallet account this signup will help in creating a new account and signup use case will add the new customer details to the database. When an existing customer wants to log in and use his wallet login will help him in doing so.

**Initial Step-By-Step Description**

Before this use case can be initiated, the user must be already logged in.

1. When a new customer wants to create an account in e wallet, customer should select signup option and fill the required details. This will create a new account and adds the details to the database.
2. When an existing customer wants to log in .User should enter his username, password.
3. If the username and password matches user will be logged in otherwise an error will be sent to user.
4. **XRef: Sec. 3.2.1**

#### **Use case: Edit Personal Details**

**Diagram:**

Database

Edit Personal Details

**Brief Description:**

When a new user want to have an e wallet account this signup will help in creating a new account and signup use case will add the new customer details to the database. When an existing customer wants to log in and use his wallet login will help him in doing so.

**Initial Step-By-Step Description**

Before this use case can be initiated, the user must be already logged in.

1. When a new customer wants to create an account in e wallet, customer should select signup option and fill the required details. This will create a new account and adds the details to the database.
2. When an existing customer wants to log in .User should enter his username, password.
3. If the username and password matches user will be logged in otherwise an error will be sent to user.

**XRef: Sec. 3.2.2**

#### **Use case: Add money to e-Wallet**

**Diagram:**

Database

Add money to e-Wallet

**Brief Description:**

The database maintains the details of the credit or debit card of the User. When a user adds a card to his wallet the details of that card will be stored in database. When a user removes a card from his wallet the details of that card will be deleted from database.

**Initial Step-By-Step Description**

Before this use case can be initiated, the User must be already logged in.

1. The system displays the list of entries which User should enter.
2. The entries are like CardType, CardNumber, ExpiryDate, CVV, UserEmail, PhoneNumber, CardHolderName.
3. The Database receives the information about the card.
4. If a user wants to remove a card then user should select remove card option and this includes select card use case. Finally card will be removed from database.

**XRef: Sec. 3.2.3**

#### **Use case: View Transaction History**

**Diagram:**

Database

View

Transaction History

**Brief Description**

The database maintains the details of the Transactions of the User. View Transaction History Use case gets that details from Database and show it to the user.

**Initial Step-By-Step Description**

Before this use case can be initiated, the User must be already logged in.

1. The system provides an option to see transaction history.
2. When he selects that option Database provide the transaction history details to the user.
3. System shows the transaction history to the user.

**XRef: Sec. 3.2.7**

#### **Use case: Purchase/Send Gift Card**

**Diagram:**

Database

View Gift Cards

**Brief Description**

The database keeps the available gift cards details. View gift cards Use case helps the user to see the available gift cards.

**Initial Step-By-Step Description**

Before this use case can be initiated, the User must be already logged in.

1. One option will be provided to the User to view available gift cards.

2. On selecting this option Database will send the available gift cards list to the system.

3. Then user can see the available gift cards.

**XRef: Sec. 3.2.4**

#### **Use case: Avail Offers**

**Diagram:**

Database

Avail Offers

**Brief Description**

The database keeps the available offers details. Avail Offers Use case helps the user to avail offers.

**Initial Step-By-Step Description**

Before this use case can be initiated, the User must be already logged in.

1. One option will be provided to the User to view available Offers.
2. On selecting this option Database will send the available Offers list to the system.
3. Then user can see the available Offers.
4. User will get an option avail Offer on each Offer on selecting that Offer user can use that Offer.

**XRef: Sec. 3.2.6**

### ***2.2.4 Bank Use Cases***

#### **Use case: Add money to Wallet**

**Diagram:**

Bank

Add money to Wallet

**Brief Description**

The money is transferred in the wallet using bank’s transfer portal.

**Initial Step-By-Step Description**

Before this use case can be initiated, the User has already logged into the E-Wallet

1. The Bank receives the details of transfer from the user.
2. The Bank then verifies whether the user is authentic.
3. The Bank generates and sends an acknowledgement that the transfer has successfully been linked with the e-Wallet.

**XRef: Sec. 3.2.9**

#### **Use case: User Authentication**

**Diagram:**

Bank

User Authentication

**Brief Description**

The bank checks the user’s detail to authenticate any transfer.

**Initial Step-By-Step Description**

1. The bank get the transfer information from the user.

2. The bank checks whether the user is registered user of the bank and send affirmation to continue the transfer.

**XRef: Sec. 3.2.10**

#### **Use case: Facilitating Make Payments/ Confirm Transaction**

**Diagram:**

Bank

Confirm Transaction

**Brief Description**

The bank provides an interface for funds to be transferred from one party to another.

**Initial Step-By-Step Description**

Before this use case can be initiated, the User has already logged into the E-Wallet and has authenticated payment cards.

1. The Bank receives the payment information about the transaction
2. The Bank facilitates the transfer of funds to the recipient.
3. The Bank confirms the transfer by checking if the accounts are credit or debited.
4. The Bank generates and sends an acknowledgement that the payment has successfully been completed.

**XRef: Sec. 3.2.8, Sec. 3.2.9**

***2.3 User Characteristics***

The user should be comfortable in using other similar interfaces such as IRCTC, PayPal. Although it’s not a requirement. The software will accompany with a User Guide.

The user as well as seller is expected to be Internet/e-mail literate.

***2.4 Non-Functional Requirements***

The network connection should be fast to facilitate smooth transfer and quick confirmation/authentication.

**3.0 Requirements Specifications**

* 1. ***External Interface Requirement***

The e-Wallet system will need the high security Transfer Portal such that of a bank’s.

<<Other interfaces might be acknowledged during the development process>>

* 1. ***Functional Requirements***

### 3.2.1 Login/Signup

|  |  |
| --- | --- |
| **Use Case Name** | Login/Signup |
| **XRef** | Sec. 2.2.1, Sec. 2.2.3 |
| **Trigger** | The user opens the app. |
| **Precondition** | The app should be opened. User must be on the network. |
| **Basic Path** | 1. The user signs up on e-Wallet (if no account already).  2. The user gets login information using email. (if no account already).  3. The user logs in for the first time and change the password. (if no account already)  4. The user logs to e-Wallet whenever he wants to make a payment/ check transaction history/ send gift cards. |
| **Post condition** | User can deposit money  Check Transactions.  Make Payments |
| **Other** | None |

### 3.2.2 Edit Personal Details

|  |  |
| --- | --- |
| **Use Case Name** | Edit Personal Details |
| **XRef** | Sec. 2.2.1, Sec. 2.2.3 |
| **Trigger** | The user clicks on the option of Edit Personal Details. |
| **Precondition** | The user is logged into his account. |
| **Basic Path** | 1. The user clicks on Edit/Change Personal Details option tab.  2. The user make required changes.  3. The user submit changes. |
| **Post condition** | User gets a confirmation mail. |
| **Other** | None |

### 3.2.3 Add money to Wallet

|  |  |
| --- | --- |
| **Use Case Name** | Add money to Wallet |
| **XRef** | Sec. 2.2.1, Sec 2.2.3, Sec. 2.2.4 |
| **Trigger** | The user selects Add Money option. |
| **Precondition** | The user is logged into his account. |
| **Basic Path** | 1. The user selects the option Add Money.  3. The user selects the option of crediting via Debit Card/ Credit Card/ Net Banking.  4. The bank opens up a portal to put balance in the Wallet. |
| **Post condition** | User will get a confirmation message which confirms the transfer. |
| **Other** | None |

### 3.2.4 Purchase/ Send Gift Cards

|  |  |
| --- | --- |
| **Use Case Name** | Purchase/Send Gift Cards |
| **XRef** | Sec. 2.2.1 |
| **Trigger** | The user can choose to purchase Gift Cards and send them to his friends. |
| **Precondition** | The user is logged into his account. |
| **Basic Path** | 1. The user clicks the Purchase Card option.  2. The user gets a list of Gift Cards.  3. The user chooses a Gift Cards.  4. The user may then send the Gift Card. |
| **Post condition** | User will receive confirmation mail. |
| **Other** | None |

### 3.2.5 Use Gift Cards

|  |  |
| --- | --- |
| **Use Case Name** | Use Gift Cards |
| **XRef** | Sec. 2.2.1 |
| **Trigger** | The user can choose to use Gift Cards during payments |
| **Precondition** | The user is logged into his account. |
| **Basic Path** | The user clicks the Use Card option during Make Payments. |
| **Post condition** | User will receive confirmation mail. |
| **Other** | None |

### 3.2.6 Avail Offers

|  |  |
| --- | --- |
| **Use Case Name** | Avail Offers |
| **XRef** | Sec. 2.2.1, Sec. 2.2.3 |
| **Trigger** | The user selects this to select a card while making payment or while removing a card from his email wallet account. |
| **Precondition** | The user is logged into his account and making a payment or removing a card. |
| **Basic Path** | The user clicks the select card option. |
| **Post condition** | User will make a payment or remove a card. |
| **Other** | None |

### 3.2.7 View Transaction History

|  |  |
| --- | --- |
| **Use Case Name** | View Transaction History |
| **XRef** | Sec. 2.2.1, Sec. 2.2.3 |
| **Trigger** | The user selects to view his previous transactions. |
| **Precondition** | The user is logged into his account and has done some transactions earlier. |
| **Basic Path** | 1. The system provides an option to see transaction history.  2. When he selects that option Database provide the transaction history details to the user. |
| **Post condition** | User’s transaction history is displayed. |
| **Exception Paths** | The transaction list is empty. |
| **Other** | None |

### 3.2.8 Make Payments

|  |  |
| --- | --- |
| **Use Case Name** | Make Payments |
| **XRef** | Sec. 2.2.1, Sec 2.2.4 |
| **Trigger** | The user selects this option to make payments. |
| **Precondition** | The user is logged into his account and has required balance in the bank account. |
| **Basic Path** | 1. The user then proceed by using Normal Payment/Avail Offers/ Use Gift Card.  2. The required amount gets deducted from the user’s wallet and is added to the seller’s account/ wallet.  3. The bank and the database authenticates the transaction. |
| **Post condition** | User and the seller will get a confirmation message which confirms the payment. |
| **Exception Paths** | Insufficient funds or if he entered incorrect details of the card while adding it. |
| **Other** | None |

### 3.2.9 Transaction Confirmation

|  |  |
| --- | --- |
| **Use Case Name** | Transaction Confirmation |
| **XRef** | Sec. 2.2.1, Sec. 2.2.4 |
| **Trigger** | The user completes the payment process and transferred the required amount. |
| **Precondition** | The user is logged into his account and has made payment |
| **Basic Path** | The bank authorizes the transfer. |
| **Alternative Paths** | None |
| **Post condition** | User receives a confirmation. |
| **Exception Paths** | Confirmation fails. |
| **Other** | None |

### 3.2.10 User Authentication

|  |  |
| --- | --- |
| **Use Case Name** | User Authentication |
| **XRef** | Sec. 2.2.1, Sec. 2.2.4 |
| **Trigger** | The user makes payment/transfer balance to his wallet. |
| **Precondition** | The user is logged into his account. |
| **Basic Path** | The bank authenticates the user by checking his details. |
| **Alternative Paths** | None |
| **Post condition** | User can proceed with the transaction. |
| **Exception Paths** | Authentication fails. |
| **Other** | None |

***3.3 Logical Structure of Data***

The data descriptions of each of these data entities are as follows:

**Wallet Data Entity**

|  |  |  |  |
| --- | --- | --- | --- |
| **Data Item** | **Type** | **Description** | **Comment** |
| User Name | Text | Name of user associated with it. |  |
| Card No | Integer | Unique number associated with each wallet. | Unique per card |
| Gift Card | Gift Card Class Object | Gift Card that user can use during payments. |  |
| Amount | Double | Amount of money each user/ seller has in the wallet. | Can be in decimals. |

**User Data Entity**

|  |  |  |  |
| --- | --- | --- | --- |
| **Data Item** | **Type** | **Description** | **Comment** |
| Username | String | Name of the user | Chosen by user |
| Password | String | Password provided by user | Chosen by user/ Cryptographic Hash |
| E-mail | String | E-mail of the user | Verified by admin |
|  |  |  |  |
| Address | String | Address of the user |  |
| Phone number | Integer | Phone number of the user | Verified by admin |

**Transaction Data Entity**

|  |  |  |  |
| --- | --- | --- | --- |
| **Data Item** | **Type** | **Description** | **Comment** |
| Status | Text | Current status of the transaction | Can be Successful or Unsuccessful |
| Time | Integer | Time at which the transaction took place |  |
| Date | Integer | Date at which the transaction took place |  |
| Amount | Integer | Amount involved in the transaction |  |
| Seller Wallet | Wallet Object | Account to which the funds are to be transferred | Provided by the seller |
| User Wallet | Wallet Object | Necessary details of the payment card to carry out the transaction | Provided by the user. |

***3.4 Security***

Since, the system is working with money, a very high security is required for it to be successful. The passwords will protected using SHA-256 crypto hashing algorithm. No sensitive information will be hosted on the network.

The user can verify his/her transaction using View Transaction History option and can report if there are any discrepancies.