

# Project Requirements Specification

Version 1.0

## e-Wallet for BITS, Goa Campus

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# 1.0. Introduction

## ***1.1. Purpose***

The purpose of this document is to present a detailed description of the e-Wallet System that we will be implementing for BITS, Goa Campus. It will explain the purpose and features of the e-Wallet system, the interfaces of the system, what the system will do, and how the students will be able to use the system for carrying out payment at any of the outlets/vendors within the BITS Goa Campus. This document is intended for both the stakeholders and the developers of the system and will be proposed to the administration of BITS Goa for its approval, which could in the long run lead to a 'Cash-less Campus' system which has already been implemented at our sister campuses.

## ***1.2. Scope of Project***

This system will be an e-Wallet designed for use by the students of BITS Pilani, Goa Campus. The main objective is to provide the students/vendors at Bits Goa with a simple software that will enable easy, secure payment at all of the outlets available on campus and therefore facilitate a new technology-driven means by virtue of which,

every student can do away with the burden of having to worry about carrying cash around campus for various needs.

Currently, some of the issues brought out by the students include the fact that they do not receive change in cash, on making purchases at most outlets on campus. Added to this is the problem of most students having to wait for a long time to get the bill settled after a small purchase. Even worse are scenarios where the outlet owners are robbed of their money when the students manage to get away without payment when there is a huge rush. The e-Wallet system has the potential to solve all of these issues if implemented across campus.

Currently, the system is designed for usage only by students of Bits Goa. Further additions could be made to the system to make this facility available to any on-campus resident, say, staff members, wardens, hostel assistants, etc.

### *1.3. Glossary*

Term	Definition
e-Wallet	The software component that handles the payment and associated data and provides the user( in our case, a student) with options to make payments, recharge and avail loyalty benefits provided by the vendors.
Student	Refers to the students at Bits Goa. More specifically, any person with access to the outlets at Bits Goa who has an SWD account maintained at the campus and is identified by a unique ID number provided by the campus.
Database	Collection of all the information, i.e., payment logs, credit balances and dues, account balances and registered student information is monitored by this system.
Vendor	Person/outlet on campus who(which) receives the payment from the students when a purchase is made by them.
Payment tracker	A system which facilitates the secure payment process by interacting with the student and the database and the vendor.
Loyalty benefit	Special offers made by outlets on campus to students who make purchases from their outlets using the e-Wallet system.
Logs	Refers to data that indicates the proceedings of various transactions between the student and the vendor. In a way, they behave as a sort of proof of payment.
Account	Refers to the unique account maintained for each registered student which comprises a security pin, balance amounts, unique name and id.

Recharge	Recharge here, is used to refer to the transfer/translation of money from the student's swd-account to e-Wallet cash, which the student can use at the various on-campus outlets.
User	The term user has been used along with the term Student in this document. In all cases both terms refer to a student as described above.

### ***1.4. Overview of Document***

The next chapter, the Overall Description section, of this document gives an overview of the functionality of the product. It describes the informal requirements and is used to establish a context for the technical requirements specification in the next chapter.

The third chapter, Requirements Specification section, of this document is written primarily for the developers and describes in technical terms the details of the functionality of the product.

Both sections of the document describe the same software product in its entirety, but are intended for different audiences and thus use different language.





## 2.0. Overall Description

### 2.1. System Environment

The e-Wallet system has four active actors.

The Student, Vendor, Payment Tracker System and the Database.

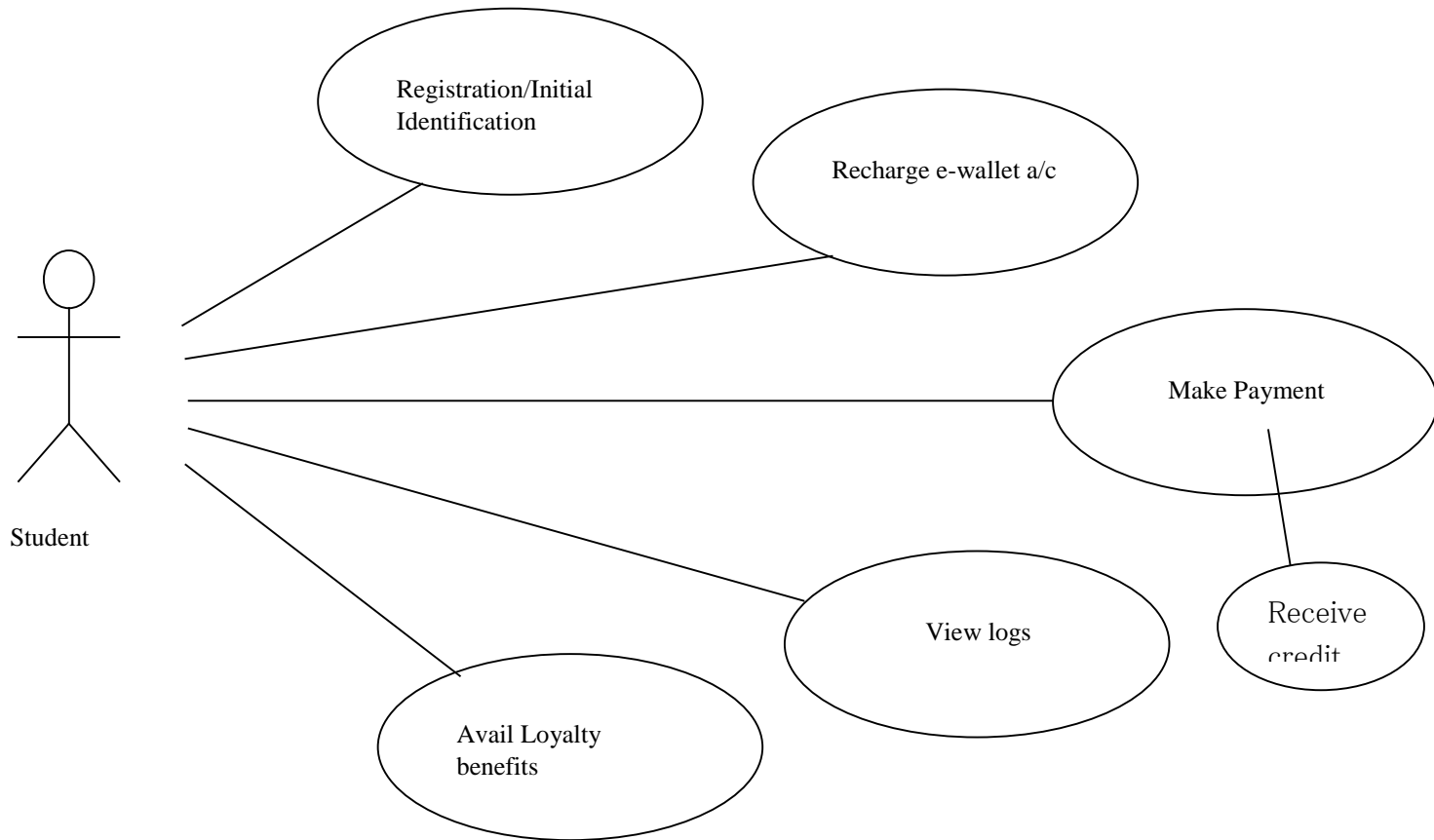
### 2.2 *Functional Requirements Specification*

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

The Student is a key actor as the software is designed to meet the needs of students on campus. The payment tracker and the Database are the major actors that facilitate the functionality of the e-Wallet software. The Vendor interacts mostly outside of the software system; most of the interaction is limited to receiving payments, i.e., e-Wallet cash, which can be later translated to normal cash based on the adopted methodologies.

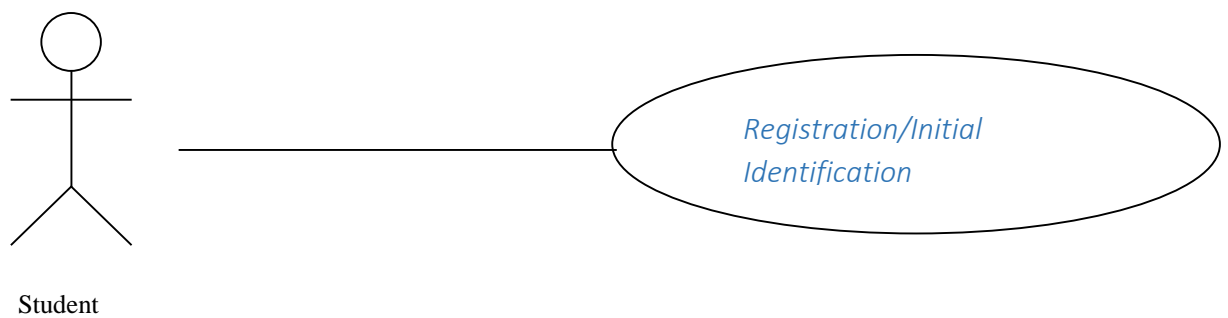
In this section, we list out the various actors and all their associated use-cases in depth, showing the basic description and flow of action within and outside the system.

### 2.2.1. Actor – Student



#### a) Use case: Registration/Initial Identification

Diagram:



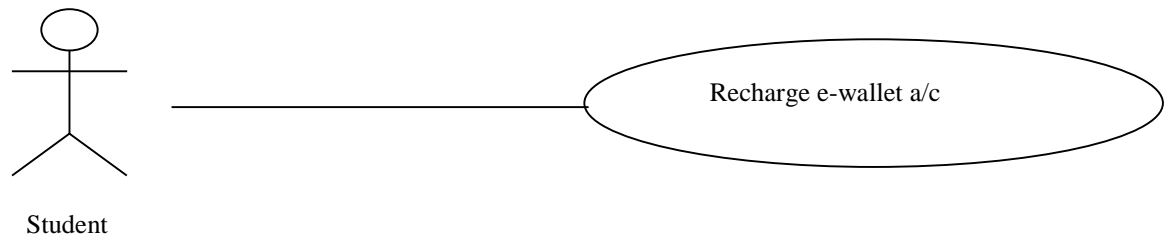
### Brief Description

The Student registers for the e-wallet service.

### Initial Step-By-Step Description

1. The User (Student) registers for the service using his/her student ID. The rest of the details will be then imported from their SWD accounts
2. On input of a valid student ID the program will then prompt the User to set a 4-digit pin for security purposes.
3. On Successful registration the User is asked to set the initial balance and credit limits.
4. The Entered amount for the initial balance is then added to his/her respective e-Wallet.
5. In step 1, if the User enters a non-existent ID number the program prompts the User to re-enter. If Valid then return to step 2.
6. In step 3, if the User enters an amount greater than that allowed by the system, the system prompts the user to re-enter the amount under the limit.

### b) Use case: Recharge e-wallet a/c



### Brief Description

The Student recharges the wallet.

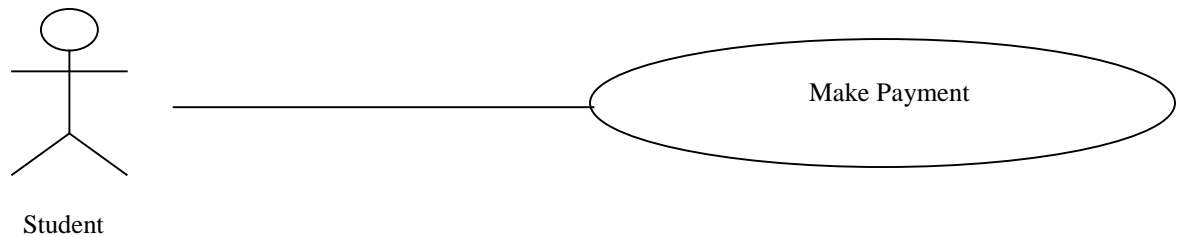
### Initial Step-By-Step Description

1. The User enters the amount required in the e-Wallet account.
2. The e-Wallet is credited with requested amount from the SWD account.
3. In Step 2 if the entered amount is greater than what is available in the SWD account, the User is then prompted to avail the credit option.

4. If amount entered is more than the credit limit, the user is prompted to enter again.

### c) Use case: Make Payment

Diagram:



#### Brief Description

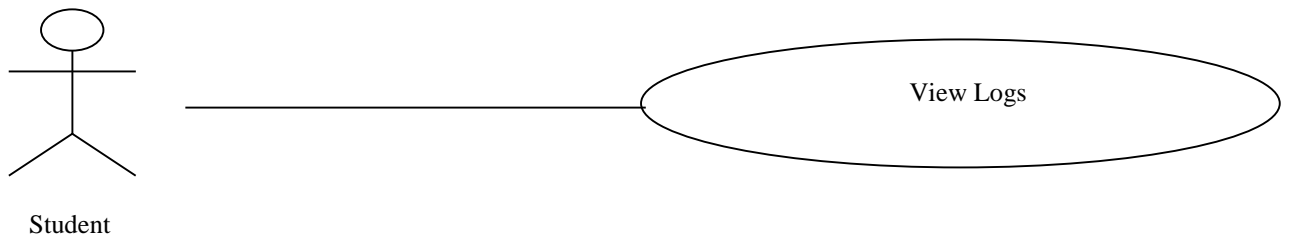
The Student makes the payment to the vendor after it has been authorized by Payment Tracker System.

#### Initial Step-By-Step Description

1. Payment request is sent to the payment tracker.
2. Based on various criteria the tracker approves/disapproves the payment request.
3. On approval the payment is then received by the vendor.
4. In step 2, if the criterions are not met then the payment is not authorized. In that case the system reverts to step 1.

#### d) Use case: View Logs

Diagram:



#### Brief Description

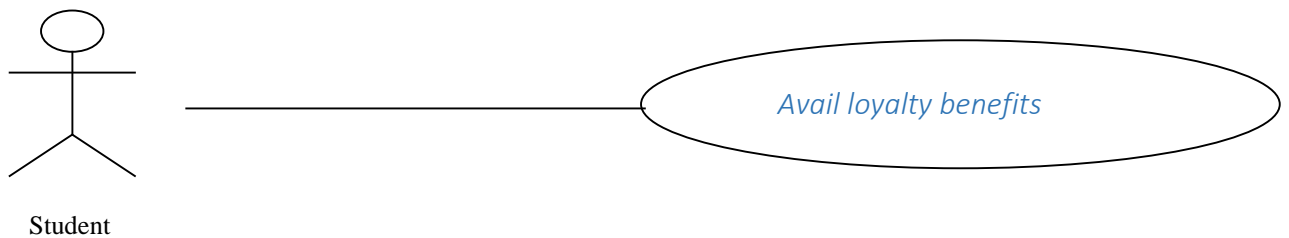
The Student wishes to view the logs.

#### Initial Step-By-Step Description

1. The System requests the database for logs.
2. The database then acquires logs from the Payment tracker.
3. The logs are then presented by the system to the User

#### e) Use case: Avail loyalty benefits

Diagram:



#### Brief Description

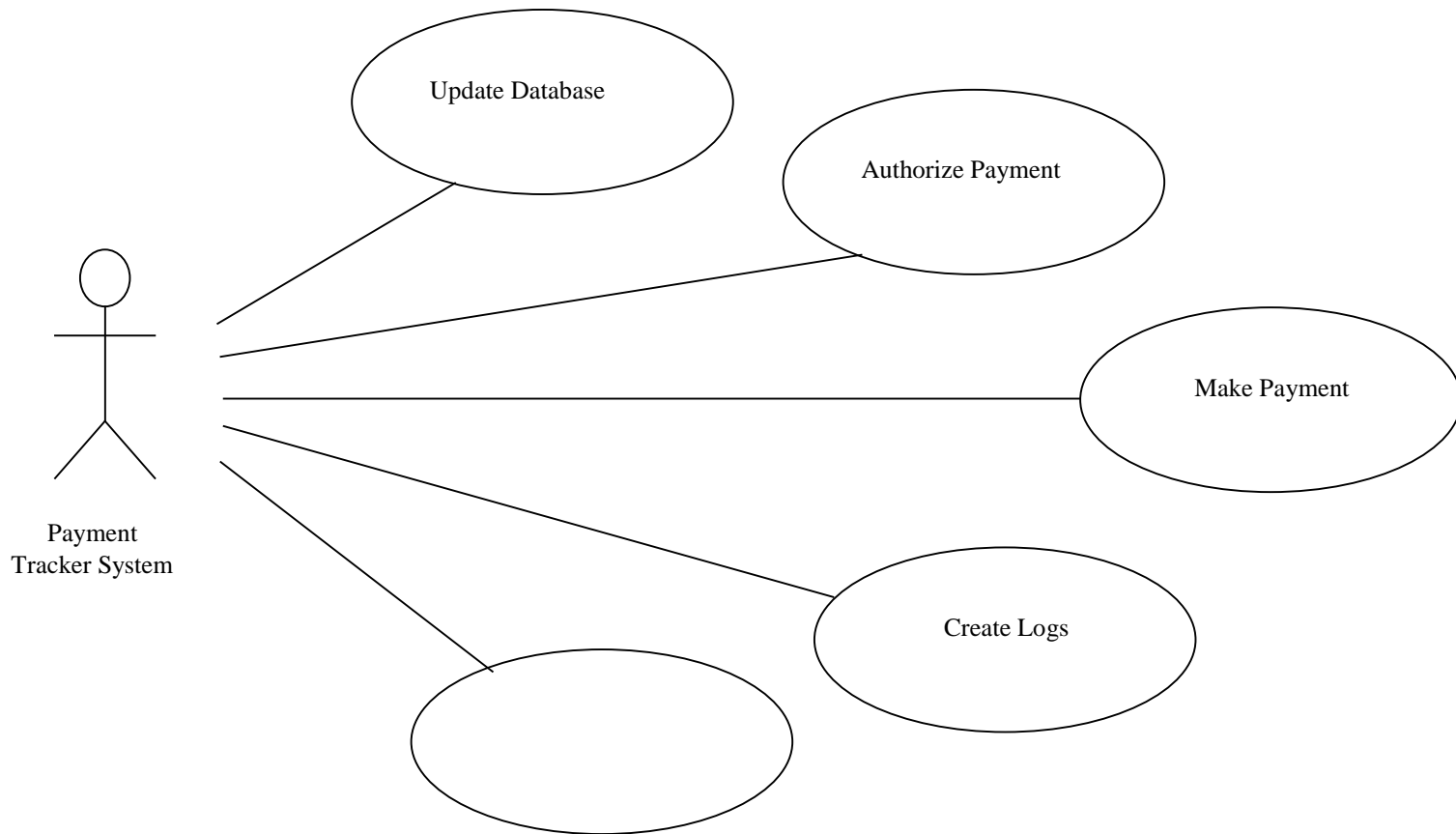
The Student redeems the loyalty points/benefits as rewarded by the vendor.

### Initial Step-By-Step Description

1. Instead of paying from the account, the Student may choose to redeem the loyalty points.
2. The system analyses these points.
3. If sufficient, the required loyalty points are used for the payment.
4. If not, payment is done partly through these points, and the rest deducted from the account.

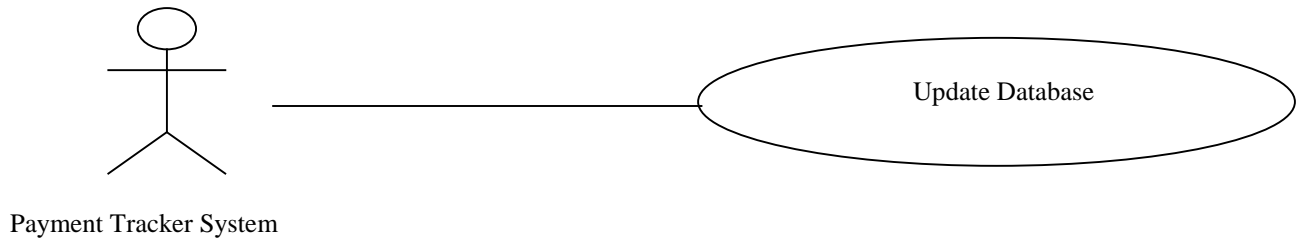
### 2.2.2. Actor – Payment Tracker System

The Payment Tracker System has the following use cases:



### a) Use case: Update Database

Diagram:



#### Brief Description

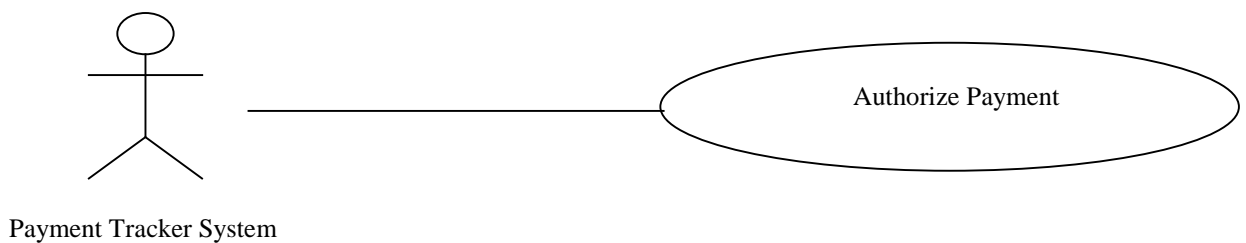
The Tracker updates the current information about the account in the Database

#### Initial Step-By-Step Description

1. The Tracker takes in the information about the payments made and the loyalties availed by the student.
2. The Tracker accesses the student account information already stored in the Database.
3. The Tracker updates this account information as per the present scenario.

### b) Use case: Authorize Payment

Diagram:



#### Brief Description

The Tracker checks whether the payment is possible or not.

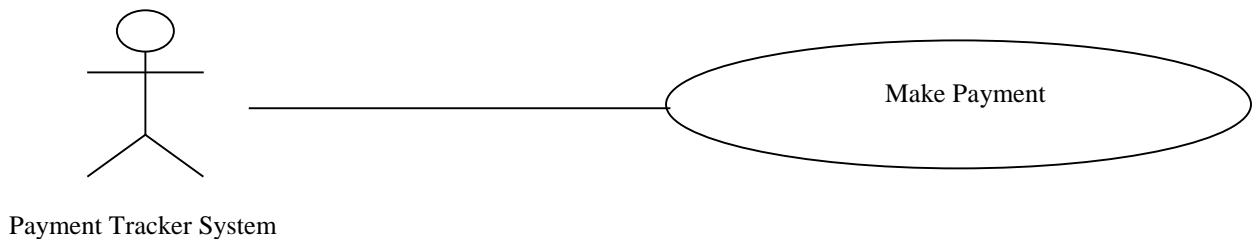


### Initial Step-By-Step Description

1. The Tracker checks if the payment to be made is present in the SWD account.
2. If the amount is available in the account, the payment is authorized.
3. If the required amount is not present in the account but there are sufficient credits available to satisfy the requirement, the payment is authorized.
4. Else, if there is neither sufficient amount nor sufficient credits available in the account, the payment is not authorized and the transaction is not possible.

### c) Use case: Make Payment

Diagram:



### Brief Description

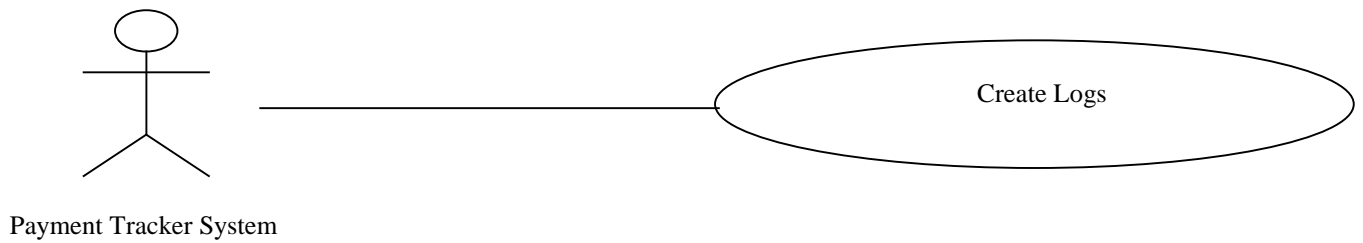
The Tracker makes the payment from the student account to the vendor after it has been authorized.

### Initial Step-By-Step Description

1. The Tracker takes in the amount entered (which is already authorized) by the student from his account and deducts that amount from the total amount present in the account.
2. If the amount required is not present in the student account, the Tracker takes the available credits equivalent to the amount required from the student account.
3. The tracker provides the amount/credits to the vendor.

#### d) Use case: Create Logs

Diagram:



#### Brief Description

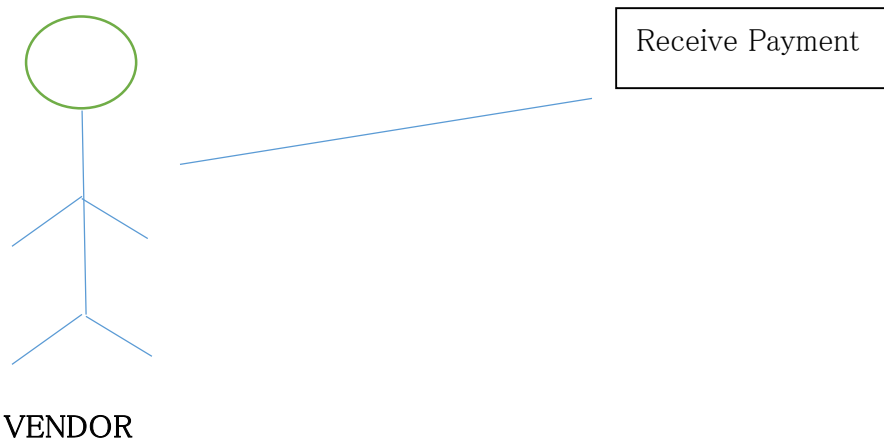
The Tracker logs in all the student information and the transaction details and stores it into the Database.

#### Initial Step-By-Step Description

1. The Tracker stores the student's name and ID number.
2. The Tracker stores the payment made in the transaction.
3. The Tracker stores the current balance and the amount of credits remaining in the student account.
4. The Tracker bunches all this information and stores it into the Database.

### 2.2.3. Actor – Vendor

Use case diagram



a) Use case: Receive Payment

**Brief Description:** The vendor receives payment whenever a student buys something from that particular vendor.

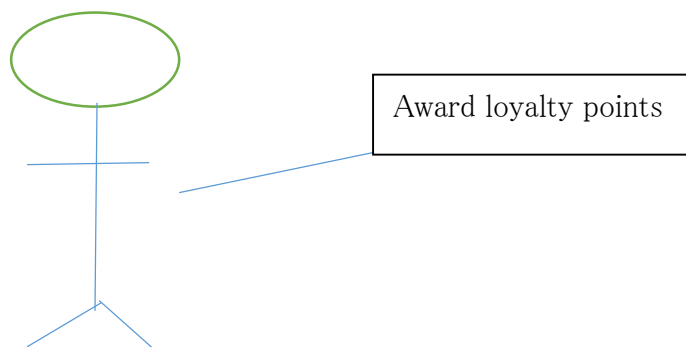
**Initial step by step procedure:**

1. A student makes payment, payment tracker system checks whether it is an authorized payment and if it is, then the vendor receives the payment.
2. If it is not an authorized payment, then the vendor will not receive payment and there is a message displaying “payment unsuccessful”.
3. The payment tracker system creates logs regarding the payment details which is stored in the e-wallet database.

4. The system shows whether the payment is successful or not and returns to the main page.

b) Use case: Award loyalty points

Vendor



**Brief description:** The student is awarded with loyalty points by the vendor if the student makes certain amount of payment as specified by the vendor.

**Initial step by step procedure:**

1. The vendor gives loyalty points to student if the student meets certain standards in making payment using e-Wallet.
2. These points are added to the student's e-Wallet account.
3. The system shows the loyalty points along with the payment details at the end of payment.

#### 2.2.4. Actor – e-Wallet Database

Use case Diagram:

Database



##### a) Usecase: Registration

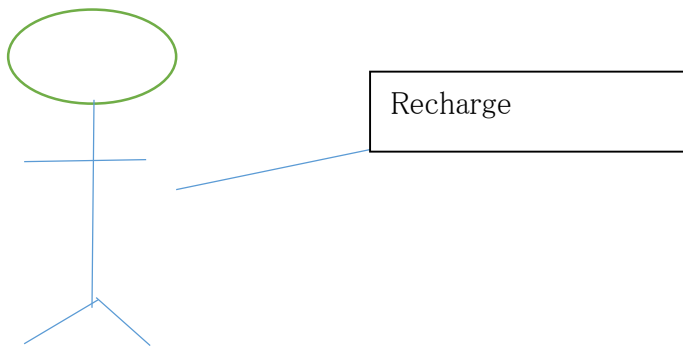
**Brief description:** A student who wants to use e-wallet facilities must register for it using unique user name, password and security check.

**Initial step by step procedure:**

1. When the student selects the registration, the system shows the page to complete registration.
2. The student has to complete registration using unique username, password. These details are stored in the e-wallet database.
3. Each student has an account which he uses to make payments.

Use case Diagram:

Database



### **b) Usecase: Recharge**

**Brief description:** The e-wallet of the student is recharged by adding money to their respective account from his swd account in the form of e-Wallet cash.

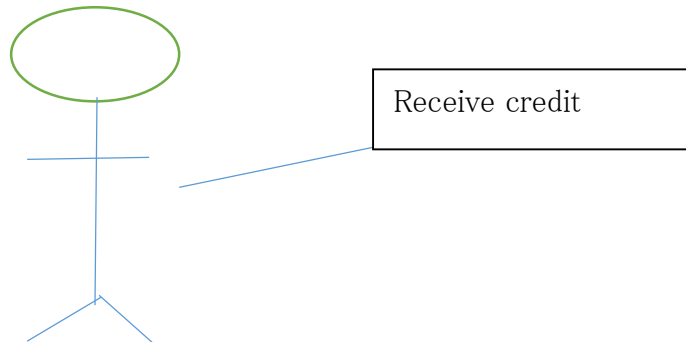
**Initial step by step procedure:**

1. When the student selects the recharge, he enters the page where he can give the details of the amount of money to be added to his e-wallet account .
2. That much amount of money is recharged to his e-wallet account from swd account.
3. Details regarding this recharging are stored in the e-wallet database.
4. The amount of money present is also updated everytime the payment is made.

### c) Usecase: Receive credit

Use case Diagram:

Database



**Brief Description:** A student can receive certain amount of credit to make payments when there is no money in the e-wallet account. This credit can be paid later.

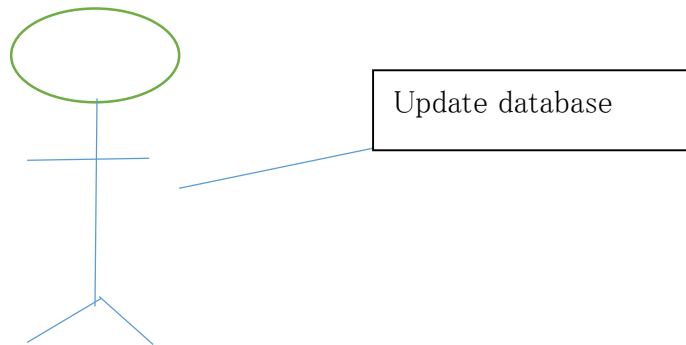
**Initial step by step procedure:**

1. A student can use credits to make payments.
2. When he selects the receive credits option, he receives certain fixed amount of credits which he can use to make payments.
3. Details regarding this payments are stored in the e-wallet database.

#### d) Usecase: update database

Use case Diagram:

Database



**Brief description:** Whenever the payment is made, the database is updated with respective payment details and the details of the particular student who made payment.

**Initial step by step procedure:**

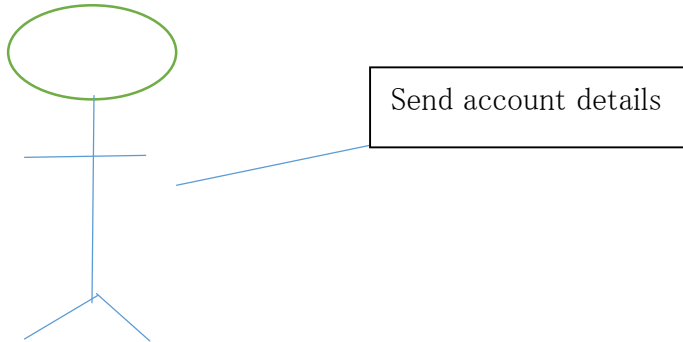
1. Whenever the payment is successful, the update database automatically updates the e-wallet database.
2. It updates the current balance of that particular student after payment.



### e) Use case : Send account details

Use case Diagram:

Database



Diagram

**Brief description:** A payment tracker system checks whether the payment is authorized or not by looking at the account details from this use case.

**Initial step by step procedure:**

1. When a student makes payment, the details of the payment are sent to the payment tracking system.
2. At the same time, the account details of that student are sent to the payment tracking system from the e-wallet database.
3. The payment tracking system uses these details to check whether there is sufficient amount of balance in that student's account and if so, it authorizes the payment.

## 3.0. Requirements Specification

### ***3.1 External Interface Requirements***

The Project links to the external systems of a Barcode Scanner being used to enter the student ID and along with that the student's e-wallet is linked to their SWD account. The Student details are imported from their SWD accounts. The payments made will be made through every student's SWD account so as to keep a uniform management system that can also be tracked by the parents. The SWD account fields of interest to the e-Wallet is the Student ID number which then will be followed by a 4-digit pin to verify the validity of the transaction.

The *Recharge e-Wallet* use case updates the e-Wallet with money from the SWD account. The *Update Database* use case updates the student account details with their current balance and credit limits.

## 3.2 Functional Requirements

### 3.2.1 User Registration

Use Case Name	Registration/Initial Identification
Trigger	---
Precondition	Student has not registered for an e-Wallet account
Basic Path	<ol style="list-style-type: none"><li>1. The User (Student) registers for the service using his/her student ID. The rest of the details will be then imported from their SWD accounts</li><li>2. On input of a valid student ID the program will then prompt the User to set a 4-digit pin for security purposes.</li><li>3. On Successful registration the User is asked to set the initial balance and credit limits.</li><li>4. The Entered amount for the initial balance is then added to his/her respective e-Wallet.</li></ol>
Alternative Paths	<p>In step 1, if the User enters a non-existent ID number the program prompts the User to re-enter.</p> <p>If Valid then return to step 2.</p> <p>In step 3, if the User enters an amount greater than that allowed by the system.</p> <p>The system prompts the user to re-enter the amount under the limit.</p>
Postcondition	The e-Wallet account is initiated and ready to use.
Exception Paths	The User may abandon the registration process at any time.
Other	NA

### 3.2.2 Recharging e-Wallet

Use Case Name	Recharge e-Wallet a/c
Trigger	The user selects a <i>Recharge A/C</i> option.
Precondition	Student has registered successfully and possesses a unique 4-digit pin
Basic Path	<ol style="list-style-type: none"><li>1. The User enter the amount required in the e-Wallet account.</li><li>2. The e-Wallet is credited with requested amount from the SWD account.</li></ol>
Alternative Paths	<p>In Step 2 if the entered amount is greater than what is available in the SWD account, the User is then prompted to avail the credit option.</p> <ol style="list-style-type: none"><li>1. If amount entered is more than the credit limit the user is prompted to enter again.</li></ol>
Post condition	The e-Wallet is recharged with the aforementioned balance.
Exception Paths	The attempt may be abandoned at any time.
Other	The Credit amount is then billed to the availing User in the next semester. Logs are then updated

### 3.2.3 Viewing Logs

Use Case Name	View Logs
Trigger	User selects the option to view logs.
Precondition	Student possesses an e-Wallet a/c with a unique 4-digit pin
Basic Path	<ol style="list-style-type: none"><li>1. The System requests the database for logs.</li><li>2. The database then acquires logs from the Payment tracker.</li><li>3. The logs are then presented by the system to the User.</li></ol>

Alternative Paths	NA
Post condition	The Logs have been displayed to the User.
Exception Paths	The User may abandon the operation at any time.
Other	NA

### 3.2.4 Make Payments

Use Case Name	Make Payments
Trigger	The User purchases something and wishes to use the e-Wallet
Precondition	The payments are authorized by the payment tracker
Basic Path	<ol style="list-style-type: none"> <li>1. Payment request is sent to the payment tracker.</li> <li>2. Based on various criteria the tracker approves/disapproves the payment request.</li> <li>3. On approval the payment is then received by the vendor.</li> </ol>
Alternative Paths	In step 2, if the criterions are not met then the payment is not authorized. In that case the system reverts to step 1.
Post condition	The Payment is received by the concerned system.
Exception Paths	The User may abandon the operation at any time.
Other	The User information includes ID number and the 4-digit security pin.

Please note that all tables and descriptions under “**Requirements Specification**” (Chapter 3.0) are meant for developers; For any other reference, please see “**Overall description**” (Chapter 2.0)

