SOFTWARE REQUIREMENT ENGINEERING

SSE3301-1

MINI PROJECT TITLE:

ONLINE PETROL STATION PAYMENT SYSTEM (OPSPS)

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1. Project Preliminaries

1.1 Purpose and Scope of The Product

Online Petrol Station Payment System (OPSPS) is a system that allow user to pay their petrol bill through online banking at petrol station that are registered under this system. OPSPS is introduced to minimize contact between the customer and the petrol station workers especially during the payment process. The customer can make fuel payment directly through online banking using their phone. OPSPS system maximizes the convenience of not having to walk to the counter to pay for the gas and reducing the amount of time spent outside and away from a car.

The manager of each petrol station is in charge to monitor the customers' data and the profit that were recorded in the system. The petrol station workers are responsible to keep updating the customers' record every day to avoid any miscalculation during the payment process. The system should allow the customer to choose the location of the petrol station, punch in the pump number and request the amount of fuel that needed for full tank before make payment through online banking that was developed by the system.

1.2 Business Concept

The objective of this project is to develop a complete system and deliver to the users which comprise the whole online petrol station payment system. OPSPS system should be able to choose correct location of the petrol station.

Besides, OPSPS system must be able to view fuel information. The system should display the amount of petrol equivalent to the amount of payment that made by the customer. The system also should notify the customer about the rewards and discounts based on the frequently purchased.

OPSPS system allow customers to choose their preferable payment method such as debit/credit card, online payment and also E-wallet. The validation process should be made by the system to check customers' card number or details information before process to make payment. The receipt will be display as soon as the payment is succeeded.

1.3 Stakeholders

The stakeholders are the Director of online petrol station payment system (OPSPS), manager of petrol station (venue manager), petrol station workers, financial department, the public (customer), registration department, operator department, online banking company (eg. visa/mastercard) and software developer.

The client, which is the director of OPSPS will have full access to the OPSPS. The director will also fully fund the project initially before there are partnerships with other companies. The director will choose to approve any partnerships and any marketing plans. All reports such as financial reports, data analytics and technical reports need to be presented to the director.

Next, the manager of the petrol station. The manager can access all customer's payment, data analytics, profits, and information of other users. The manager will be in contact with the departments regarding the reports to be presented to the director.

One of the users is the petrol station workers. The worker can access the OPSPS system to access information on the customers' payment to help and assist customers. Points and rebates could also be used and redeemed at the petrol station's counter with the help of the worker.

Next, the financial department. All the payment and profit records will be managed and recorded by the financial department. The financial department will also manage online payment from customers with other online banking companies such as Visa and Mastercard. The financial department will also prepare a financial report to be submitted to the manager and presented to the owner of the petrol station. The finance department will also manage refunds and point redemption with the representative departments. The department will also manage money input from the user through OPSPS's own e-wallet service.

Next is the public. The public needs to create an account with the OPSPS system in order to access the service. The public will pay for their petrol bill using the app though online banking service or any e-wallet service. The public user can also request for cancellation and

refund of their payment. The customer can also gain points in every payment and redeem the points at the representative petrol station.

The registration department plays a role in organizing data of the new customer/user for the application. They need to keep track of customers' personal information from time to time to ensure that the personal details are the latest.

Operator department consists of System Reliability Engineer, System Support Engineer, Head and Enterprise Operation. The role of system reliability engineer is developing software that increases the efficiency of production processes, resolving problems, responding to accidents, and, in most cases, assuming on-call responsibilities. System Support Engineer will help customers diagnose and troubleshoot software and hardware issues, as well as install applications and programmes. Head, Enterprise Operations is responsible for designing policies, managing customer support, and introducing technological solutions are among her duties. For developers, the role of software developers enlist in identifying, designing, installing, and testing a software system that has been built from the ground up for a company.

Online banking companies such as Maybank, CIMB are one of the partnership companies with OPSPS. In order to make a purchase, the customer needs to top-up their e-wallet in the system. This banking system in which transactions are carried out electronically over the Internet. It's an electronic payment system that allows bank or other financial institution customers to perform a variety of financial transactions via the financial institution's website.

1.4 Ideas and Solution

Online Petrol Station Payment System (OPSPS) will be beneficial for the customers who have busy schedules because this system can minimize the time needed while fill the vehicle's fuel tank. This system produces a different approach to the one being examined as that system only applicable to the specific petrol station. The petrol station who are registered under this system will be able to collect all the customers' details.

Besides, OPSPS system also created with system database that will store all the customer information including the regular amount of fuel consumed, username and also password. The system also will send backup keywords such as phone numbers and e-mail address in case if the customers forgot their password. This will reduce the amount of time

needed by using the ‘Remember Me’ button during the registration process and protect the account information if they forgot their details. The customers can view purchase history to keep tracking their budgets. OPSPS system also will inform the customers about the discounts and reward points via the email address or phone number.

Several types of payment method are implement in this system to maximize the use of ‘cashless’ term. These methods are more hygiene and safer because less contact with other people. Customers can pay using their credit card or debit card by inserting the card number or they also can use online payment depends on their preferences. E-wallet payment also will be implemented in this system such as Touch ‘n’ Go to allow the customer to make payments from their E-wallet account.

1.5 Document Overview

This document consists of the project details, functional and non-functional requirements, different types of UML diagrams, appendices and also references.

2. Functional Requirements

2.1 Scope of the System

Online Petrol Station Payment System (OPSPS) is a system that allow user to pay their petrol bill through online banking at petrol station that are registered under this system. During this pandemic Covid-19, OPSPS is introduced to minimize direct contact between the customer and the petrol station workers to avoid from crowded at petrol station especially during the payment process. Customer can login to the OPSPS, find nearest petrol station, purchase fuel, enter pump number, make fuel payment directly through online banking using their phone, and send feedback regarding to the OPSPS to the board of directors. Besides that, OPSPS system maximizes the convenience of not having to walk to the counter to pay for the gas and reducing the amount of time spent outside and away from a car.

The system developer in the field of information technology and computer technology is to make All petrol station in Malaysia to improve their selling fuel by offering purchase fuel using online banking without go to counter. Just only find nearest petrol station, OPSPS is looking forward to make more benefit to the all-petrol station around Malaysia and also to decrease direct contact with workers especially during this pandemic. Also, popularization of Java application is also helping OPSPS a lot in deploying its service. Java application is becoming acceptable and easier by most of the users and customers because of OPSPS is Java-Based.

However, to make sure OPSPS is an efficient application and user friendly, venue manager always needs to define promotions for different events so that customer can get latest information regarding the upcoming events such as public holiday in Malaysia . Venue manager also able to manage price of fuel and add the availability of the pump to the system.

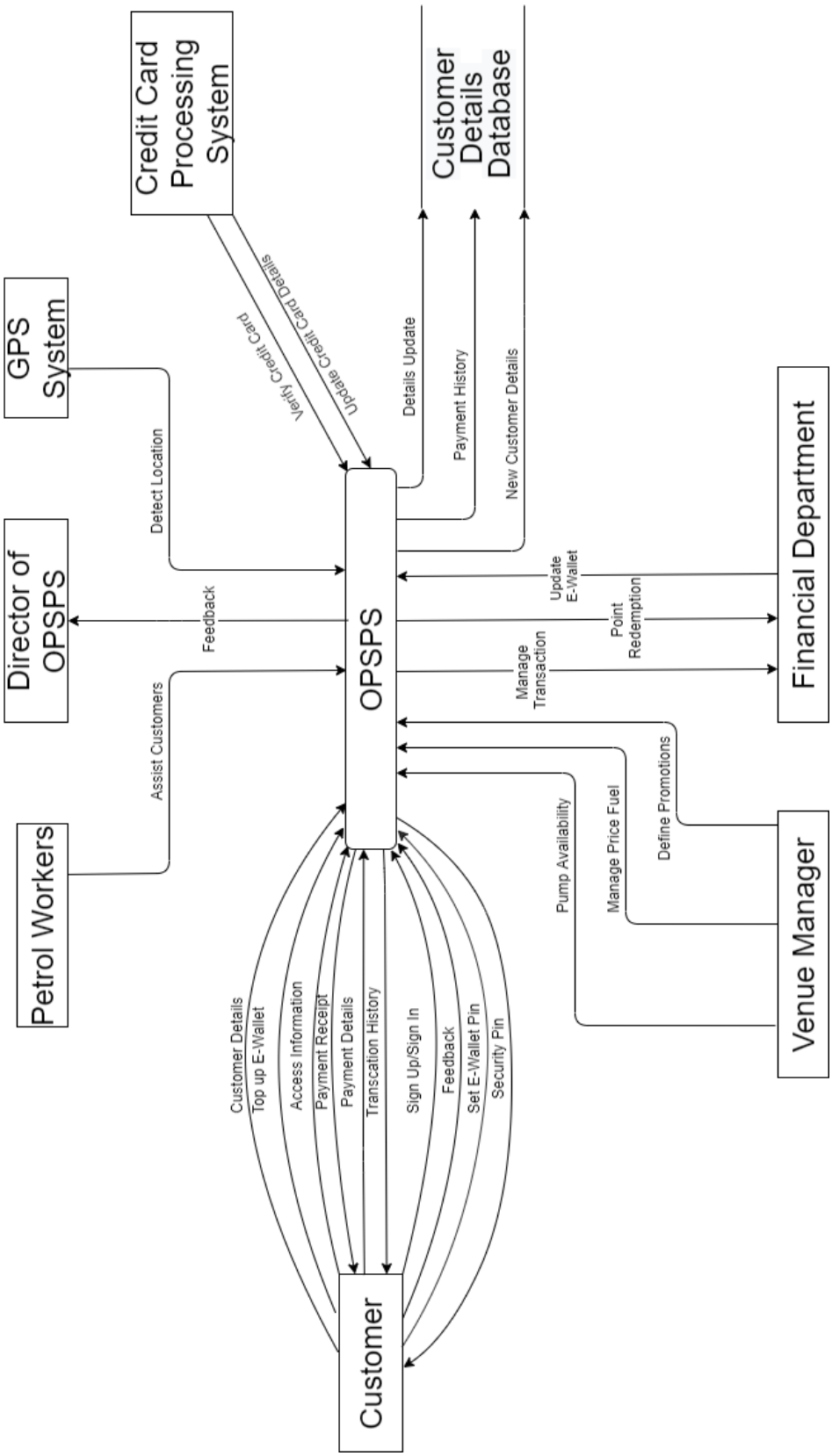

Diagram 1 : OPSPS Context Diagram

2.2 Function Requirements - Summary

Table 1 : Summary of Functional Requirements

Req ID	Page	Short Title
FR-01	14	Customer must login to the system to start the service
FR-01.1	14	Customer must be able to sign up to the system
FR-01.2	15	Customers must be able to sign in to the system
FR-01.3	15	Customers must provide a unique id and password
FR-01.4	15-16	The system must send an email regarding forgotten password to customers
FR-02	16	The system must create an account for customer
FR-02.1	16	Customer must enter their personal details such as full name, phone number, email address
FR-02.2	17	The system must send a 4 digit code to phone number or email
FR-02.3	17	Customer must input the 4 digit number to verify identification
FR-03	17-18	Customer must be able to view all the fuel information
FR-03.1	18	The system must display the price of the fuel
FR-03.2	18-19	The system must display the petrol station nearby
FR-03.3	19	The system must display the rewards and points for discount
FR-03.4	19	The system must display types of fuel in that particular petrol station
FR-04	19-20	Customer must be able to modify payment method
FR-04.1	20	Customer must input 6 digit security pin number as a password for payment
FR-04.2	20	Customer must be able to save multiple details of their debit or credit card
FR-04.3	21	Customer must verify their credit /debit card by entering TAC number that was provided by the respective bank
FR-04.4	21	Customer must be able to top-up e-wallet in the system
FR-05	21-22	The system must display an interactive location of petrol station and number of pump
FR-05.1	22	Customer should be able to see the petrol station location and number of pump via the interactive system
FR-06	22-23	Customer must be able to purchase fuel at specific location and pump
FR-06.1	23	Customer must be able to select the petrol station location and number of pump
FR-06.2	23	The system must prompt the user to input fuel type and purchase amount in RM or full tank option
FR-06.3	23-24	The system must ask for 6 digit security pin number to verify payment

FR-07 FR-07.1 FR-07.2	24 24 25	The system must be able to receive payment from customers The system must be able to deduct money from customer's e-wallet The system should send notification mail to the customer when transaction is complete
FR-08 FR-08.1 FR-08.2 FR-08.3	25 25-26 26 26	Customer must be able to fuel their car The system must identify the selected petrol station location and pump's number The system must display "start fueling" when ready The system must display total price of fuel that have been purchase
FR-09 FR-09.1 FR-09.2	26-27 27 27	The system must display a digital receipt on the screen Customer must be able to see the digital receipt The system must display the customer e-wallet balance
FR-10 FR-10.1	27-28 28	The system must store the previous purchase in history Customer must be able to look back at their purchase history and digital receipt
FR-11 FR-11.1	28 29	The system must store customer's information in a database Customers should be able to update his/her personal information
FR-12 FR-12.1	29 29-30	The system must provide a "Help" tab to answer customer's inquiry The system must accept feedback from the customer
FR-13 FR-13.1 FR-13.2 FR-13.3 FR-13.4 FR-13.5	30 30 31 31 31-32 32	Venue Manager must be able to login to the system Venue Manager must be able to manage price of fuel Venue Manager must be able to cancel the availability of pump Venue Manager must be able to add the availability of the pump to the system Venue Manager must be able to highlight the amount of purchase with desired discount rates Venue Manager must be able to define promotions for different purchase
FR-14	32	The system must save information of discounts and promotions
FR-15	33	Board of Directors must be able to view feedback from the customer

Table 2: Summary of Functional Requirements Dependencies

Requirement ID	Depends On
FR-01	FR-01.1
FR-01.3	FR-01.1
FR-01.4	FR-01.2
FR-02	FR-01.1
FR-02.1	FR-01.1
FR-03.1	FR-13.1
FR-05	FR-03.2
FR-06.1	FR-13.3
FR-06.3	FR-04.1
FR-07	FR-04
FR-08.1	FR-13.3
FR-10.1	FR-09
FR-11.1	FR-02.1
FR-14	FR-13.4, FR-13.5
FR-15	FR-12.1

2.3 Functional Requirements – Detailed

FR – 1 Customer must login to the system to start the service

Sources Customer

Description The system will provide a GUI interface with “Sign in” and “Sign Up” link to the user

Rationale New customers will need to sign up to the system, while existing users can proceed with the sign in process

Priority High

Dependents

Depends On FR-01.1

Comments

FR – 1.1 Customers must be able to sign up to the system

Sources Customer

Description The system will prompt the user with a sign up screen, where the user needs to key in sign on unique ID and password..

Rationale The customers will need to sign up before they can start to use the online petrol station payment system to buy fuel, in order to verify the customer’s identity.

Priority High

Dependents FR-01,FR-01.3,FR-02, FR-02.1

Depends On

Comments

FR – 1.2 Customers must be able to sign in to the system

Sources Customer

Description The system will prompt the user to sign in with his/her existing account. Users will need to provide valid sign-on ID and password.

Rationale The customer will need to login to his/her own account when they want to use the system. This is used to verify the user's identity

Priority High

Dependents

Depends On FR01.4

Comments

FR – 1.3 Customers must provide a unique ID and password

Sources Customer

Description Customer must set their own ID and password in order to use the system. There'll be a login screen for customers to input their unique ID and password.

Rationale This is used as an identification step by the system, which is meant to ensure that the user logging in is that person himself.

Dependents

Depends On FR-01.1

Comments

FR – 1.4 The system must send an email regarding forgotten password to customers

Sources Customer

Description If a customer forgot his/her password, he/she can make a password request to the system via "Forgot password?" link. The system will then ask the user to input his email, then the system will send an email containing the forgotten password to that customer.

Rationale Longer processing time might cause customers to think the transaction is unsuccessfull and cause double transactions.

Dependents

Depends On FR-01.2

Comments

FR – 2 The system must create an account for customer

Sources Customer

Description The system will create an account for a customer when they sign up using their unique ID and the password entered. The system will then save their account for future log in.

Rationale When a new user signs up to the system, an account will be created so they can log in back in the future and use the system again.

Priority High

Dependents

Depends On FR-01.1

Comments

FR – 2.1 Customer must enter their personal details such as full name, phone number, email address

Sources Customer

Description Customer will be given a GUI form with data fields, i.e. name, mailing address, phone number and email address. Customer must fill in all details in order to proceed.

Rationale Customer information is needed for future use, and help the existing users so that they don't need to re enter personal information every time they log in to the system

Dependents FR-11.1

Depends On FR-01.1

Comments

FR – 2.2 The system must send a 4 digit code to phone number or email

Sources Customer

Description The system will send a 4 digit code to the customer's email address or phone number as a verification code for the user.

Rationale The 4 digit code helps in identifying the right user and the user need to verify in order to continue using the system.

Priority High

Dependents

Depends On

Comments

FR – 2.3 Customer must input the 4 digit number to verify identification

Sources Customer

Description Customer must enter the 4 digit code sent to their email or phone number via message to verify their account. The user need to verify their account before continuing using the system.

Rationale The 4 digit code helps in identifying the right user and the user need to verify in order to continue using the system.

Priority High

Dependents

Depends On

Comments

FR – 3 Customer must be able to view all the fuel information

Sources Customer, venue manager and board of directors

Description The system will display all the fuel information needed such as the location of fuel station nearby, the available pump's no, the type of fuel, price of the specific fuel and the points and rewards when purchase. It also will display if the pump is broken or the station is closed.

Rationale It gives the user the ability to choose which location and type of fuel they want.

Priority High

Dependents

Depends On

Comments

FR – 3.1 The system must display the price of the fuel

Sources Customer and venue manager

Description Price of the fuel will be shown at the top right of the screen

Rationale The price displayed is an indicator for the user. The user needs to know the price before purchasing. The venue manager needs to know the current price and the price display so he/she can change the price if needed.

Priority High

Dependents

Depends On FR-13.1

Comments

FR – 3.2 The system must display the petrol station nearby

Sources Customer

Description The system will display all the nearby locations of fuel stations using a GPS system to indicate where the user is.

Rationale The displayed nearby fuel stations help the user to easily pick and choose where they want to fuel their car at. It also helps in giving the information if the station is closed

Priority High

Dependents FR-05

Depends On

Comments

FR – 3.3 The system must display the rewards and points for discount

Sources Customer

Description Discount details are included in the details of an event that is going to be viewed by the customer

Rationale For a specific amount of purchase, there will be a reward and points for the customer to claim. The customer can use the points to get a discount for the next purchase.

Priority High

Dependents

Depends On

Comments The system may need to display revised ticket price after considering certain discounts

FR – 3.4 The system must display types of fuel in that particular petrol station

Sources Customer

Description The system will display all the fuel type in the fuel station for using to choose

Rationale Each type of fuel have different price and customer can choose which they prefer

Priority High

Dependents

Depends On

Comments

FR – 4 Customer must be able to modify payment method

Sources Customer

Description Customer must be able to change or add credit and debit card so they can top-up their e-wallet easily

Rationale Payment method is important so the user can easily purchase fuel using “opsps”

Priority High

Dependents FR-07

Depends On

Comments

FR – 4.1 Customer must input 6 digit security pin number as a password for payment

Sources Customer

Description The system will prompt the user to enter a 6 digit security pin number as their password for the e-wallet.

Rationale Customers need to enter this 6 digit security pin number every time they purchase fuel for security purposes.

Priority High

Dependents FR-06.3

Depends On

Comments

FR – 4.2 Customer must be able to save multiple details of their debit or credit card

Sources Customer

Description Customers can save multiple debit and credit cards for future top-up

Rationale Customers need to top-up their e-wallet first before purchasing fuel. By allowing customers to save multiple credit and debit cards allow them to easily top-up their e-wallet

Priority High

Dependents

Depends On

Comments

FR – 4.3 Customer must verify their credit /debit card by entering TAC number that was provided by the respective bank

Sources Customer

Description The system will prompt the user to input their TAC number provided by the respective bank, which will be verified if the TAC number is correct and the credit/debit card will be saved.

Rationale TAC number is needed so the respective bank will allow transactions and as a security measure

Priority High

Dependents

Depends On

Comments The system need to communicate with major banks in order to process a transaction

FR – 4.4 Customer must be able to top-up e-wallet in the system

Sources Customer

Description Customers will be able to top-up their e-wallet as much as they want. E-wallet is the only acceptable payment method for the system

Rationale Since e-wallet is the only acceptable payment method, customers need to top-up their e-wallet with sufficient amount before purchasing

Priority High

Dependents

Depends On

Comments

FR – 5 The system must display an interactive location of petrol station and number of pump

Sources Customer

Description A GUI location chart and pump's number will be displayed to the customer

Rationale The GUI location chart and pump's number that was displayed is for the customer to see and choose which location and specific pump's number they want to make fuel purchase

Priority High

Dependents

Depends On FR-03.2

Comments

FR – 5.1 Customer should be able to see the petrol station location and number of pump via the interactive system

Sources Customer

Description location and pump's number that are still available will be marked with green, while unavailable location and pump's number will be marked with red

Rationale The color of the location and pump's number tell the customer which one is available and can be selected. The system will automatically update the available seats periodically.

Priority High

Dependents

Depends On

Comments

FR – 6 Customer must be able to purchase fuel at specific location and pump

Sources Customer

Description Customer can select fuel location and pump's number based on their own choice

Rationale The user will have the ability to pick and choose where they want to fuel their car

Priority High

Dependents

Depends On

Comments

FR – 6.1 Customer must be able to select the petrol station location and number of pump

Sources Customer

Description The system will display the nearby fuel station and let the customer choose which station they want to go to and the specific pump's number.

Rationale Even though the system shows multiple nearby stations, customers can still pick specific stations based on their choice.

Priority High

Dependents

Depends On FR-13.3

Comments

FR – 6.2 The system must prompt the user to input fuel type and purchase amount in RM or full tank option

Sources Customer

Description After choosing the specific station and pump's number, the system will let the user choose the type of fuel and purchase amount in RM. The user can also pick a full tank option

Rationale Each type of fuel has a different price and users can freely choose the amount they want to purchase for the fuel. Full tank option will calculate the amount after the user has fully fuel their car or based on the maximum balance in e-wallet.

Priority High

Dependents

Depends On

Comments

FR – 6.3 The system must ask for 6 digit security pin number to verify payment

Sources Customer

Description The system will prompt the user to enter their 6 digit security pin password as a verification to their payment.

Rationale The 6 digit security pin number acts as the password for the user's purchase. This will make the user's e-wallet more secure.

Priority High

Dependents

Depends On FR-04.1

Comments

FR – 7 The system must be able to receive payment from customers

Sources Customer

Description After the customer has entered their 6 digit security pin, the system will receive the payment through the user's e-wallet.

Rationale Customers have to pay for their purchased fuel.

Priority High

Dependents

Depends On FR-04

Comments

FR – 7.1 The system must be able to deduct money from customer's e-wallet

Sources Customer

Description The system will deduct money from the e-wallet after every step is successfully completed

Rationale Money from the user's e-wallet will be deducted based on the amount they entered to purchase in RM.

Priority High

Dependents

Depends On

Comments

FR – 7.2 The system should send notification mail to the customer when transaction is complete

Sources Customer

Description The system will automatically send a notification mail to the customer after transaction is complete

Rationale The system will send the notification mail to the customer when the deduction from the e-wallet is successful and the payment is confirmed. A notice on when the date and time of the purchase event will also be included in the mail. The notification indicates that the purchase is successful.

Priority High

Dependents

Depends On

Comments

FR – 8 Customer must be able to fuel their car

Sources Customer

Description Customers can fuel their car as usual after making the payment.

Rationale Customers need to go to the specific location and pump to be able to fuel their car.

Priority High

Dependents

Depends On

Comments

FR – 8.1 The system must identify the selected petrol station location and pump's number

Sources Customer

Description The system will start to identify the selected petrol station and pump when the user has arrived.

Rationale When the user arrives, they will need to press “READY”on the screen. The system will then start identifying the location and pump for the user.

Priority High

Dependents

Depends On FR-13.3

Comments

FR – 8.2 The system must display “start fueling” when ready

Sources Customer

Description After identifying, the system will display “Start fueling” on the screen.

Rationale Users can start fueling their car as usual.

Priority High

Dependents

Depends On

Comments

FR – 8.3 The system must display total price of fuel that have been purchase

Sources Customer

Description The total price of the purchased will be displayed on the screen

Rationale The displayed total price helps users who pick the full tank option to know the full total price.

Priority High

Dependents

Depends On

Comments

FR – 9 The system must display a digital receipt on the screen

Sources Customer

Description After successfully purchasing, the system will display digital receipt with date and location of the purchase

Rationale The digital receipt can help the user if the system wrongly deduct the amount from their e-wallet.

Priority High

Dependents FR-10.1

Depends On

Comments

FR – 9.1 Customer must be able to see the digital receipt

Sources Customer

Description Customer can look at the digital receipts and save it.

Rationale Printing a real receipt will be a waste as an online system. Digital receipt for an online system is much more convenient and effective.

Priority High

Dependents

Depends On

Comments

FR – 9.2 The system must display the customer e-wallet balance

Sources Customer

Description The system will display the customer's e-wallet balance after the digital receipt.

Rationale Customer can top-up their ewallet right away.

Priority Medium

Dependents

Depends On

Comments

FR – 10 The system must store the previous purchase in history

Sources Customer

Description The system will stored all the previous purchase in history

Rationale Customer can check their purchase history and look back at their digital receipts

Priority Medium

Dependents

Depends On

Comments

FR – 10.1 Customer must be able to look back at their purchase history and digital receipt

Sources Customer

Description Customer can look through their purchase history and digital receipts

Rationale Customers might have some issues with their purchase, the history and digital receipts will help them as a proof.

Priority Medium

Dependents

Depends On FR-09

Comments

FR – 11 The system must store customer's information in a database

Sources Customer

Description The system will store customer information in a customer information database

Rationale A database will be used by the system to stored information of every single customer who signed up in the system for further uses.

Priority Medium

Dependents

Depends On

Comments Customer does not need to re-enter personal information each time he/she logs in to the system

FR – 11.1 Customers should be able to update his/her personal information

Sources Customer

Description If a customer wants to make changes to his personal details, that customer can easily change or update on their profile, then the system will change the customer's information in the database too.

Rationale The system needs to store the information of customers for trading and safety purposes. Emails, name, phone number are required to contact the customer, so if there are any changes the system should be updated.

Priority High

Dependents

Depends On FR-02.1

Comments

FR – 12 The system must provide a "Help" tab to answer customer's inquiry

Sources Customer

Description The system should provide a "Help" tab to answer the customer's problems.

Rationale Most common and most asked questions will be displayed with answers to help customers easily access the system. The user also can asked specific questions.

Priority High

Dependents

Depends On

Comments

FR – 12.1 The system must accept feedback from the customer

Sources Customer

Description The GUI interface will have a “Feedback” link, where customers can give comments and feedbacks regarding the system

Rationale Feedback from customers is always important when it comes to tracing the error in the system or for future enhancement of the system.

Priority Medium

Dependents FR-15

Depends On

Comments

FR – 13 Venue Manager must be able to login to the system

Sources Customer

Description Just like customer, venue manager also need to provide an ID and password so that he/she can access the system

Rationale Since the purpose of the venue manager to use the system is not the same as the customer then a different account should be prepared for them.

Priority High

Dependents

Depends On

Comments

FR – 13.1 Venue Manager must be able to manage price of fuel

Sources Customer

Description The system will provide a GUI for the venue manager to manage the price of the fuel. All the event manager has to do is just input the price for each type of fuel based on the changes of fuel price

Rationale Venue manager needs to manage all the prices therefore the system should allow the venue manager to change the price of fuel on the system.

Priority High

Dependents

Depends On

Comments

FR – 13.2 Venue Manager must be able to cancel the availability of pump

Sources Customer

Description The system will display a list of current available pumps to the venue manager. He/she can choose which one to cancel the availability based on the condition of the pump.

Rationale Venue manager can cancel the availability of pumps if any problem occurs such as the specific pump is broken and cannot be used.

Priority High

Dependents

Depends On

Comments

FR – 13.3 Venue Manager must be able to add the availability of the pump to the system

Sources Customer

Description The system will display a list of current available pumps to the venue manager. He/she can choose which one to add to the availability based on the condition of the pump.

Rationale Venue manager can add back the availability of pumps if the broken pump has been fixed and can be used again.

Priority High

Dependents

Depends On

Comments

FR – 13.4 Venue Manager must be able to highlight the amount of purchase with desired discount rates

Sources Customer

Description Venue manager can highlight a certain amount of purchase and define discounts to that amount.

Rationale Every amount of purchase will have their own discounts to attract more users to use the system.

Priority High

Dependents FR-14

Depends On

Comments

FR – 13.5 Venue Manager must be able to define promotions for different events

Sources Customer

Description Venue manage can define any promotion when there is a special event such as 5% for every purchase regarding 5 years anniversary.

Rationale Since different events will have different promotion and also discount, the system should be capable to receive details of discounts and promotions for every event

Priority High

Dependents FR-14

Depends On

Comments

FR – 14 The system must save information of discounts and promotions

Sources Customer

Description Every time a new discount or a promotion has been defined, the system will automatically save details of that discount/promotion in the database

Rationale When there is an event that uses the same discount and promotion, the venue manager can apply the same setting as before for the current event. Another reason is that the information is saved for any changes that are made to the discount and promotion.

Priority Low

Dependents

Depends On FR-13.4, FR-13.5

Comments

FR – 15 Board of Directors must be able to view feedback from the customer

Sources Customer

Description The system will mail feedbacks from the customer to the Board of Directors automatically

Rationale Only the board of directors can view the feedback from the customer about the comment to the system.

Priority High

Dependents

Depends On FR-12.1

Comments

3. Non-Functional Requirements

Table 3. Summary of Non-Functional Requirements

ReqID	Page	Short Title
IR – 1	35	The system must be implemented using Java application
IR – 2		The system must provide appropriate menus, toolbars, buttons and containers.
PR – 1	36	App startup time must not exceed 7 seconds
PR – 2	36	Time taken for the system to send digit codes to customer must not exceed 30 seconds
PR – 3	37	Time taken for the system to successfully send notification mail must not exceed 5 minutes
PR – 4	37	Time taken for the system to identify petrol station location and pumping station number must not exceed 30 seconds
PR – 5	38	Time taken for the system to update e-wallet amount must not exceed 30 seconds
SR – 1	38	The system should provide secured login interface
SR – 2	39	The system should allow only Venue Manager to modify and update events and pumps availability.
SR – 3	39	The system should only allow customers to update their own personal details
SR – 4	40	The system should only allow director to access feedback from customer
SR – 5	40	The system should encrypt the data of credit card while requesting verification from the bank
SR – 6	41	The system should only allow customers to view their own personal information and history transactions
SR – 7	41	The system should only allow transactions to be done between the currency in the customer's e-wallet.
OR – 1	42	Java SDK must be installed into user’s mobile devices
OR – 2	42	A Global Positioning System (GPS) must be installed into user’s devices.
OR – 3	43	The system must be able to run in all major mobile phone Operating Systems.
OR – 4	43	The system’s size needs to be less than 100MB for all devices.
LR – 1	44	The system will need legal license/certificate from government
LR – 2	44	Contract between customers and system is needed to protect customer’s privacy
OC – 1	45	GUI guide will be given for the first time user of this system/application
OC – 2	45	Time taken to train the venue manager and petrol station worker until they are familiar with the system must be within 1 week
OC – 3	46	The system should automatically start maintenance work by itself
OC – 4	46	The system must be adaptable to future development and improvement

3.1 Interface Requirement

IR – 1 The system must be written in Java programming language.

Sources Board of directors

Description The developers of the system must implement Java programming language in the system.

Rationale Java is a top choice for cross-platform development as it can run in many different operating systems. The fundamental reason is it is more secure, portable, and maintainable than C++ or any other language, and it has stronger high-level concurrency capabilities.

Priority High

Dependents

Depends On

Comments

IR – 2 The system must provide appropriate menus, toolbars, buttons and containers.

Sources Customers, venue manager, board of directors

Description The system needs to have effective GUIs for easy control by touch screen.

Rationale Providing user experiences that are consistent in supporting logical next steps and encouraging extra involvement in the system. To ensure that the user finds it simple to achieve their objectives during every visit.

Priority Low

Dependents

Depends On

Comments

3.2 Performance Requirements

PR – 1 App startup time must not exceed 7 seconds

Sources Customer

Description When the app is opened, the app will display a loading screen. The app needs to be successfully launched to the “log-in” page in less than 7 seconds.

Rationale The first impression the user has from an application is the time it takes to start. Apps that take too long to show something useful may frustrate users, leading to bad reviews and uninstalls.The quicker your app can launch, the smoother the user experience will be.

Priority Low

Dependents

Depends On

Comments

PR – 2 Time taken for the system to send digit codes to customer must not exceed 30 seconds

Sources Customer

Description When the customer is verifying their identification for the first time, or when the customer forgot their password, digit codes will be sent to the customer through email and phone number in under 30 seconds.

Rationale Shorter processing time will decrease customer’s waiting time. This will increase the customer’s satisfaction and also security.

Priority Low

Dependents

Depends On FR-02.2,FR0-2.3,FR-04.1

Comments

PR – 3 Time taken for the system to successfully send notification mail must not exceed 5 minutes

Sources Customer

Description The system will generate a notification mail according to the predefined format, and then send it to the targeted customer

Rationale This is to increase efficiency of the system. Customer can be notified almost immediately regarding their purchases

Priority Low

Dependents

Depends On

Comments

PR – 4 Time taken for the system to identify petrol station location and pumping station number must not exceed 30 seconds

Sources Customer

Description After customer enter the selected petrol station location and pump's number, the system should be ready to allow customer to start fuelling in under 30 seconds

Rationale Shorter processing time ensures efficiency of the interphase and customer satisfaction. Therefore, the customer does not need to wait for a long period of time to start fuelling.

Priority Low

Dependents

Depends On FR-06.2

Comments

PR – 5 Time taken for the system to update e-wallet amount must not exceed 30 seconds

Sources Customer

Description After the customer top-up or fueled their car, the total amount in the system's e-wallet should be updated in less than 30 seconds. This is to prevent any double transactions and casualties.

Rationale Longer processing time might cause customers to think the transaction is unsuccessfull and cause double transactions.

Priority Low

Dependents

Depends On FR-04.4

Comments

3.3 Security Requirements

SR – 1 The system should provide secured login interface

Sources Customer, petrol station worker,venue manager, board of directors

Description Users will always be prompted to enter user ID and password every time they want to login to the system

Rationale This is to ensure that unauthorized personnel won't abuse the system by accessing customer's information

Priority High

Dependents

Depends On FR-01.3

Comments

SR – 2 The system should allow only Venue Manager to modify and update events and pumps availability.

Sources Venue manager

Description Venue Manager will be provided with a unique login ID and password so that the system can recognize the identity of the user as a venue manager

Rationale It is the venue managers' duty and the right to modify the events, promotions and discounts. The venue manager will also set the available and unavailable pumping stations in case of any casualties.

Priority High

Dependents

Depends On FR-13 - FR13.5

Comments

SR – 3 The system should only allow customers to update their own personal details

Sources Customer

Description The system will provide an electrical form to customers who wish to change/update their personal details. Only customers can access this form

Rationale Customer’s info is actually privacy/confidential and only they can access their personal details

Priority High

Dependents

Depends On

Comments Password is again needed in order to modify customer information

SR – 4 The system should only allow director to access feedback from customer

Sources Customer, directors

Description Board of Directors will be provided with a unique ID and password so that the system recognizes them as board of directors. The system will provide another link “View Feedbacks” to board of Directors, where other users do not have such links

Rationale Board of directors has to take customer’s feedback to improve the effectiveness of the system

Priority Medium

SR – 5 The system should encrypt the data of credit card while requesting verification from the bank

Sources Customer

Description Customer’s credit card number is encrypted by the system before it is sent to the bank for verification

Rationale This is to protect customer’s credit card number from being eavesdropped

Priority High

Dependents

Depends On

Comments

SR – 6 The system should only allow customers to view their own personal information and history transactions.

Sources Customer, venue manager

Description Only the customer and the related departments could review informations and transactions for security and analytics purposes

Rationale Customer’s details and transaction history are very confidential. Hence only customer can view that customer’s information

Priority High

Dependents

Depends On

Comments

SR – 7 The system should only allow transactions to be done between the currency in the customer's e-wallet.

Sources Venue manager

Description During the fuelling transactions, the customer maximum fuelling total is the amount in the e-wallet. The customer needs to reload their ewallet through online transactions if the customer would like to fuel up more. To avoid the tedious refunds process, the customer's e-wallet amount will only be cut after the customer is done fuelling up.

Rationale To prevent customers from not paying or extra-paying, transactions will only be allowed in between the currency of the customer's e-wallet.

Priority High

Dependents

Depends On

Comments

3.4 Operational Requirements

OR – 1 Java SDK must be installed into user's mobile devices.

Sources Customer, board of directors

Description Java SDK must be installed into the user's device, if not redirect the user to the Java SDK download page.

Rationale In order to run OPSPS, which is Java-based, Java SDK must be installed. Hence, if there is no Java SDK available in the user's device, the system will redirect that customer to Java's website.

Priority High

Dependents

Depends On IR- 1

Comments

OR – 2 A Global Positioning System (GPS) must be installed into user's devices.

Sources Customer, petrol station worker, venue manager, board of directors

Description A mobile device needs to have a GPS module so that the system can track the user's location.

Rationale The OPSPS will track the user and automatically suggest specific locations of nearby available petrol stations to the users if they wish to fill up their vehicle.

Priority High

Dependents

Depends On

Comments The user must allow OPSPS to use a GPS tracker on the mobile device. This can be done manually in the application settings once the user has installed the application.

OR – 3 The system must be able to run in all major mobile phone Operating Systems.

Sources Board of directors

Description The OPSPS needs to be compatible with a wide range of common and latest OS like iOS, Android and Windows.

Rationale In order to gather as large a customer base as possible, the OPSPS must be compatible with the wide range of mobile phone operating systems as possible. The latest OS is needed because it improves the performance and security of the device.

Priority Medium

Dependents

Depends On

Comments For iOS users, the device must be iPhone 5s devices and later with iOS 11+. To get best performance on Android and Windows devices, the OS needs to be updated to Android 7 and later and Windows 10+ respectively.

OR – 4 The system's size needs to be less than 100MB for all devices.

Sources Board of directors

Description The OPSPS should not take too much space from the user's device.

Rationale In order to run the application without any buffer or causing the user's device to lag, the system's size should be small enough so it doesn't consume too many available spaces of the user's device.

Priority Medium

Dependents

Depends On

Comments

3.5 Legal requirements

LR – 1 The system will need legal license/certificate from government

Sources Board of directors

Description The first page of the GUI will show an electronic certificate issued by the government

Rationale This is to give assurance to the customer that OPSPS is safe and legal

Priority High

Dependents

Depends On

Comments

LR – 2 Contract between customers and system is needed to protect customer's privacy

Sources **Customer**

Description When a customer is creating an account, customers will need to agree with the system's privacy policy in which the policy will explain which information will be kept by the system and how it is used.

Rationale A Privacy Policy is not only the legally required document to disclose your practices on protecting personal information, but it is also to show users that you can be trusted, and that the system have procedures in place to handle their personal information with care.

Priority High

Dependents

Depends On

Comments

3.6 Other Constraints

OC - 1 GUI guide will be given to the first time user of this system/application

Sources Customer

Description The system will identify whether the current user is a first time user. If so, a step-by-step GUI guide will be given to the customer to guide the user to use OPSPS

Rationale GUI can deliver the message easily, hence step-by-step guide will be the best tool to guide the customer

Priority Low

Dependents

Depends On

Comments

OC - 2 Time taken to train the venue manager and petrol station worker until they are familiar with the system must be within 1 week

Sources Venue manager

Description Training will be given for the venue manager and petrol station worker on how to manage this system. Therefore, the petrol station worker and venue manager will also be able to assist the customer regarding the app.

Rationale Since they are the person in charge, they must learn on how to interact with the system

Priority High

Dependents

Depends On

Comments

OC - 3 The system should automatically start maintenance work by itself

Sources System

Description The system should automatically start maintenance work itself once a week on Saturday 12.00am to 12.10am

Rationale Errors such as data integrity, data errors, etc can be found and fixed. If a certain problem cannot be repaired automatically, the system will notify the administrator of the system to rectify the problem

Priority Medium

Dependents

Depends On

Comments

OC - 4 The system must be adaptable to future development and improvement (constraints)

Sources System

Description The OPSPS needs to be easily upgraded and developed in the future

Rationale In order to remain competitive the system will need to be upgraded. To achieve this as easy as possible the OPSPS needs to be open to upgrades

Priority High

Dependents

Depends On

Comments The system is not the final product. Hence, upgrading is needed to meet the competitive market

4. Actors

i. Customers

Description: Customer interacts directly and most frequently with the system. During the Process of make a payment, choose location , choose pump , earn and redeem points, and request payment cancellation and refund

Aliases: Consumer

Inherits: None

Actor Type: Active, Person

ii. Director of Online Petrol Station Payment System (OPSPS)

Description: Directors can view customer's feedback via the OPSPS.

Aliases: None

Inherits: None

Actor Type: Active, Person

iii. Petrol Station Workers

Description : Petrol station workers can assist and give access information to the customers at petrol station

Aliases : Staff

Inherits : None

Actor Type: Active, Person

iv. Financial Department

Description : Financial department is able to manage payment methods such as online banking and e-wallet and also manage refunds and point redemption.

Aliases : None

Inherits : None

Actor Type : Active, System

v. Venue Manager

Description: Venue manager is in charge of managing the price of fuel and managing the availability of the pump to the system. Venue manager is the only person who can to highlight the amount of purchase with desired discount rates and define promotions for different events

Aliases: None

Inherits: None

Actor Type: Active, Person

5. Use Case Diagram

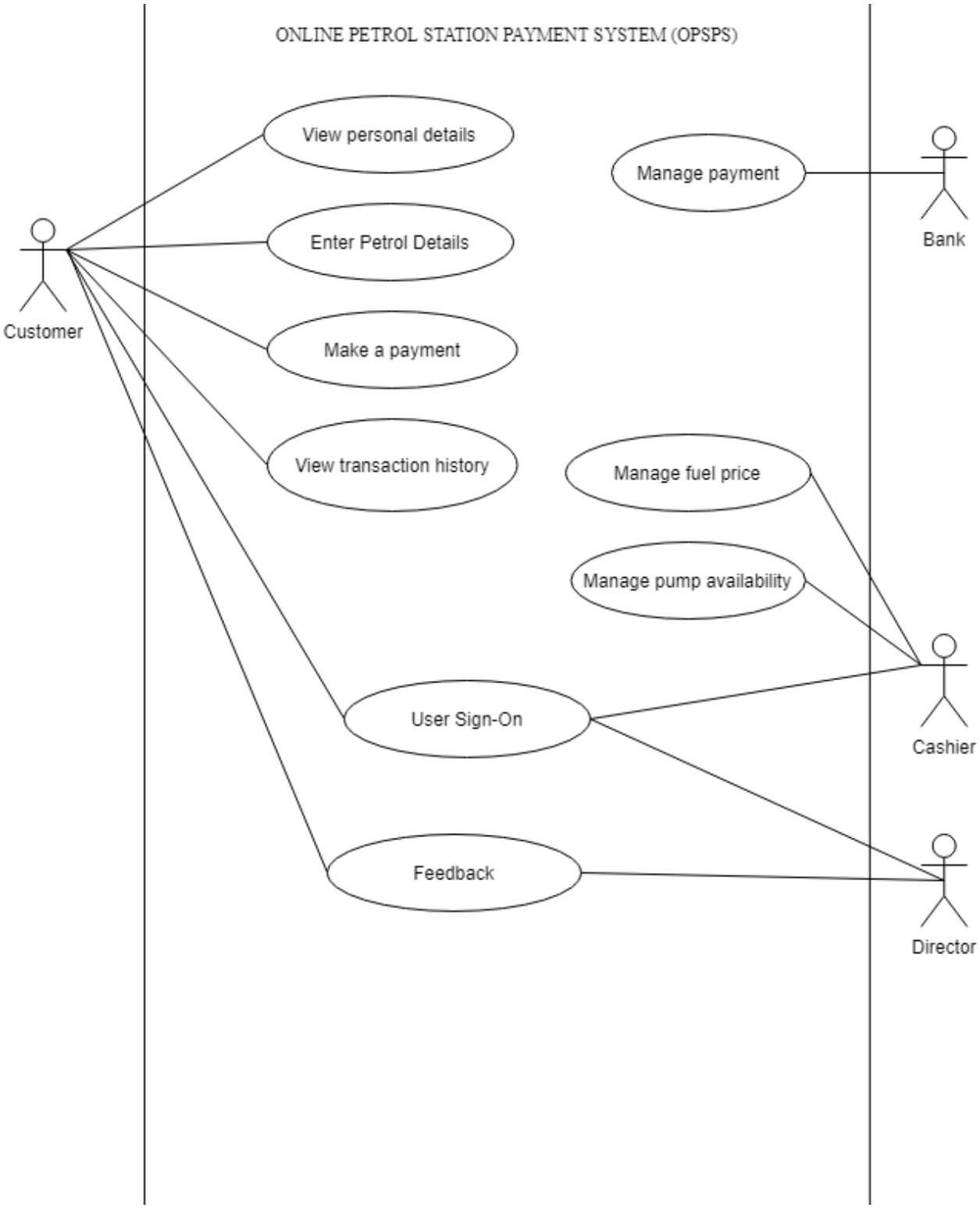

Diagram 2 : OPSPS Use Case

6. Use Case Descriptions

6.1 Use Case Description for User Sign On:

Brief Description	A user who wishes to access the OPSPS needs to provide to the system a valid sign-on.
Actors	Customer, Venue Manager, Director, Financial Department
Preconditions	Sign-on provided must be valid User does not input the sign-on details wrongly Sign-on user must be registered to the system
Main Flow	When the user opens the OPSPS application, a window that prompts the user to input the phone number. User must input his/her phone number in order to use the system. The system will then verify that user's identity by referring to the OPSPS database. Once the match is found, a message window will appear, informing the user that sign-on is successful. If the user is a first-time user, the system will then send a 6-digit code to the phone number and require the user to input the

	code to the system for identity authentication.
Alternative Flows	In a case where the user fails to have access to the phone number. There'll be a link named "Forgot phone number?" in order to help users to retrieve his/her account. The user will need to provide a valid email address, and the system will send an email which would recover the user's account.
Postconditions	Users will be able to access the system. The system will identify the user's identity as a customer.

6.2 Use Case Description for Manage personal E-wallet

Brief Description	The customer needs to set up their E-wallet account into the OPSPS before purchasing petrol.
Actors	Customer
Preconditions	Customers must successfully log in to the system.
Main Flow	Once a customer has signed on to the system, an option that asks the customer to add an E-wallet will appear. Customers will first need to manage their E-wallet account in the system. Then, customers can either choose to set a pin number, view balance or top-up their account.
Sub Flow	**Add E-wallet to OPSPS** If the customer chooses to add an E-wallet account, the system will prompt the customer to enter their bank details such as Full name in customer's bank account, account No. and choose Bank Name. The system will then require the customer to input a TAC number for identity authentication that has been sent to the customer's mobile phone number that is linked to the bank account.

	Set pin-number. If the customer has successfully set up their E-Wallet account, the system will then ask the customer to input a 6-digit pin number. The customer has to input the pin number twice for validation. This pin number will be asked right after the customer has input their payment details (location, pump number etc.) and wants to proceed for payment. **Top-up money into E-wallet** The customer can see the balance in their account once they choose the 'Manage E-wallet' option. If the customer chooses 'Top-up Money', the system will show a list of recommended amounts (RM 10, RM 30, RM50 and etc.) or the customer's desired amount. Once the customer has chosen the amount, the system will then require the customer to input TAC that will be sent to the customer's mobile phone for identity authentication. Customer's bank account will be automatically deducted based on the customer's desired top-up amount.
Alternative flow	**Add E-wallet to OPSPS.** If the customer fails to link their bank account to the E-wallet in the system, the system will

	show an error message and require the customer to try again. The E-wallet account will not be created. **Set pin-number.** If the customer fails to enter the same pin number twice in a row, the system will show an error message and ask the customer to try again. **Top-up money into E-wallet.** If the customer does not have enough balance in their bank account, the transaction will not occur and the balance in the customer's E-wallet account will not be updated. If the customer fails to enter the right TAC number twice, the transaction will be terminated and the customer will be returned to 'Top-up Money' menu.
Postconditions	The customer's E-wallet details will be updated in the E-wallet database. The desired top up amount will be added into the customer's E-wallet account.

6.3 Use Case Description for View Personal Details

Brief Description	The customer can view their personal information that has been input to the system.
Actor	Customer
Preconditions	The customer has signed on to the system.
Main Flow	After the customer has successfully signed on to the system. There will be an option for customers to see their personal details. If the customer has chosen to view their personal details, the system will show the information of the customer which consists of ID, Full Name, birthday, e-mail address, home address, account number, E-wallet balance, phone number and pin number.
Alternative Flow	There will be a ‘back’ button if the customer is done looking at their personal details which will return them to the main menu of OPSPS.

Postconditions	Updated promotion will be saved into the database.

6.4 Use Case Description for Enter Petrol details

Brief Description	Customers must enter their petrol details if they want to proceed with purchasing petrol at a petrol station.
Actors	Customer
Preconditions	Customer has logged in to the system.
Main Flow	**Choose a Petrol Station.** The system can track the user's location and would simply give the user a list of recommended locations of nearest petrol stations to the user once the user opens the OPSPS. The user can choose a petrol station that they want to go to based on the given list. **Choose Pump number.** If the user has chosen the petrol station, the system will then show available pumps at the particular petrol station. The user has to choose a pump number where they have parked their vehicle. **Enter purchase amount.** If the user has chosen the petrol station and a pump number, the system will then

	ask the user ‘how much amount of fuel does the user want?’ The user has to input their desired amount where it needs to be above RM4.
Alternative Flows	**Choose a Petrol Station.** If the petrol station that the user wants to go to is not in the recommended list, the user can type the location manually and the system will search it up in the database. **Choose Pump number.** If the user chooses the unavailable petrol pump, the system will show an error and requires the user to choose a different petrol pump. **Enter purchase amount.** If the user input amount is less than RM 4, the system will show an error and prompt the user to input a higher purchase amount. In a case where the user wants to change any of the payment details, the user can simply click a ‘Back’ button on the screen and return the user to the desired menu.

Postconditions	All the payment details will be reserved for the user’s use and will be used in the next payment process.

6.5 Use Case Description for Make a payment:

Brief Description	All payment will be completed once the customers click the “Pay” button if the customers want to proceed with the payment.
Actors	Customer
Preconditions	Customer has to log in to the system and has entered payment details
Main Flow	After the customer has entered payment details, The system displays a “pay” button to proceed to make a payment and e-wallet credit will be deducted based on the amount that customer has entered.
Alternative Flows	If the customers want to change their payment details, the system will be asked for confirmation and there will be a “yes” and “no” button to the customers to check confirmation customers want to continue to make a payment or to go back to payment details. The system will return them to the payment details if the customers proceed with pressing the “yes” button.
Postconditions	The system will be display “Done Purchase Fuel” and customer can start fuel their vehicle

6.6 Use Case Description for View Transaction History:

Brief Description	Transaction history can be viewed by the customers using the button “View Transaction History”. All order details will be displayed in transaction history.
Actors	Customer
Preconditions	Customer has made a payment
Main Flow	If the customers click on the “View Transaction History” button, the system will display the location of the petrol station with GPS , time and date purchase fuel, total amount purchase , type of fuel, pump number and tax invoice number. The system also can let a customer download the transaction history into PDF files.
Alternative Flows	If the customers chosen not to click “View Transaction History” button, the system display “X” button to close the page of Transaction History and main menu will be displayed
Postconditions	Transaction history will be save at the page of payment history

6.7 Use Case Description for Give Feedback:

Brief Description	Customers can give feedback and comments on the service or the application to improve the quality of the system.
Actors	Customer
Preconditions	All payment and transaction of fuel already complete
Main Flow	The system will send “Give Feedback” to the customer and the customer will give their opinion about the application and the system work. After customer enters a message, The customer needs to press “Send” button to send the feedback to the system.
Alternative Flows	If the customer chooses to not give feedback to the system, then the customer can press the “Cancel” button to start the fuel vehicle. The feedback will not be send to the system
Postconditions	Customers need to press ”X” button to close the feedback menu and can start fuel their vehicle

6.8 Use Case Description for Manage Fuel Price

Brief Description	Venue manager will need to update the price of fuel per litre according to the Malaysia Petrol Price regularly.
Actor	Venue manager
Preconditions	Venue manager need to logged into the system using unique ID. Venue manager also need to check the standard price for petrol in Malaysia every day to ensure the price per litre is up-to-date.
Main Flow	The venue manager will be presented the current price of petrol in Malaysia every day. Different rate of price per litre will be set by the venue manager for diesel and petrol. A selection box for different type of petrol will be shown on the screen. Venue manager needs to fill up the details prices for each type of petrol. The ‘save’ button will be provided after all the information are filled by the venue manager. The manager saved all informations by pressing ‘save’ button.
Alternative Flows	The system will notify the venue manager about the changes rate of petrol price if the venue manager not update the details. An error message will be displayed if there are some details not completed.
Postconditions	The petrol price will be updated into the system database.

6.9 Use Case Description for Manage Pump Availability:

Brief Description	Venue manager be able to update the pump number that are available in that petrol station.
Actor	Venue manager
Preconditions	Venue manager needs to logged in to the system using a unique ID. The system needs to successfully identified the location of the petrol station where the customers belong.
Main Flow	After the system successfully identified the specific location of petrol station, the venue manager need to update regularly the pump number that are available into the system.
Alternative Flows	If there is no pump available in that station, the venue manager will not update the availability of the pump number.
Postconditions	The availability of pump number will be updated in the system database. The customer will be able to look out the availability of the pump number before make payment

6.10 Use Case Description for Manage Promotion:

Brief Description	Venue manager can update, modify and publish the promotion to be applied by the customers based on their points redemption and also during special events.
Actor	Venue Manager
Preconditions	Venue manager has logged in to the system using the unique ID that will be given by the system. Venue manager choose to manage selected promotions based on the events in the starting screen after logged in to the system.
Main Flow	After the venue manager chose the option to manage promotions, the system will show a list of current promotions with details and scheme of the promotion. Venue manager can choose the option to update, modify, or publish certain promotion.
Sub Flows	**Update Promotion** After venue manager has chosen to update promotion, a window form will appear, prompting venue manager to input name of promotion, date range of promotion and rage discounts available **Modify Promotion** If venue manager choose to modify a promotion, a list containing all available promotions at current time will appear. Venue manager can select a promotion that need

	changes. Next, the system will show an interface which is similar to that of update a promotion interface, with all data fields filled with existing data. Venue manager will need to do necessary changes and save it. **Publish Promotion** When venue manager choose to publish promotions, the system will show a list of available promotions together with the details of all promotions. Venue manager can highlight which promotion to be removed (multiple promotions can be selected). Then the system will remove the selected promotion from the database.
Alternative Flows	**Update promotion** If the venue manager does not fill all the required fields, the system will show a warning message to ask the venue manager to complete the form before updating into the database. **Modify Promotion** If venue manager choose not to modify a promotion, a “Back” button is provided so that venue manager can exit this screen without modify any changes. **Publish Promotion**

	If at current time does not have any promotions, the system will not display any available promotions. The system will notify the venue manager about the promotions if available. If venue manager choose not to publish a promotion, the screen will provide an option “Back” button so that venue manager can cancel any changes.
Postconditions	Any updates and changes about the promotions will be updated into system database.

6.11 Use Case Description for Manage Point Redemption:

Brief Description	Different promotions will have different benefits and points to customers. Financial department is in charge of managing points redemption and ensuring the correct amount of discount is applied to customer's bill for different promotions.
Actors	Financial department
Preconditions	Venue manager must successfully update promotion events for any current events
Main Flow	Financial department needs to make adjustments on the system's payment process and manage how each point could be redeemed, how much discount the customer will receive and how it benefits the customers. This is to ensure the correct amount of cash flow in and out and prevent any loss.
Alternative Flows	Venue manager does not update any promotion points. Hence, the department does not need to make any adjustment to the payment process in the system.
Postconditions	The adjustment will be updated to the payment process in the system and will be applied to all customers.

6.12 Use Case Description for Manage Transaction :

Brief Description	Financial manager needs to ensure the correct amount of cash flow in and out of the system to prevent any loss or lost profits.
Actors	Financial department
Preconditions	All transaction information must be updated to customer's database
Main Flow	After transaction information is updated, the financial department will analyze all transactions to ensure cash flow in and out of the system is parallel to the transaction history of the customer. There are three main transaction types available in the system : 1. E-wallet top up transaction 2. Fuelling transaction without point redemption 3. Fuelling transaction with point redemption If all data matches up, the transaction history will be unchanged.
Alternative Flows	If the transaction information does not match cash flow in the system, a report needs to be made by the financial department to find the source of the problem. This is to prevent the same problem from occurring again in the future. Moreover, adjustments to the transaction

	data need to be made to make sure all data matches up.
Postconditions	After all the data matches up, the transaction history will be updated and the report will be saved to the database.

6.13 Use Case Description for Update E-Wallet:

Brief Description	After customers top-up their e-wallet amount through online banking interphase, corresponding information will be sent to the financial department to update the customer's e-wallet amount.
Actors	Financial department
Preconditions	Customers must successfully pay the amount to be updated to their e-wallet through the online banking interphase.
Main Flow	The system will send the customer to the online banking interphase and the customer will pay a respective amount to be added into the e-wallet . Then, this transaction information will be analyzed by the financial department. After verification, the respective amount will be updated to the customer’s e-wallet.
Alternative Flows	If the customer chooses to top up their e-wallet amount but the online banking transaction is unsuccessful, the customer’s e-wallet amount will not be updated and the system will show an error message that the process is unsuccessful.

Postconditions	The customer’s e-wallet amount will be updated for customer’s usage.

6.14 Use Case Description for Get Feedback:

Brief Description	Only the director of OPSPS can view the feedback given by customers. Director can check the conditions of this system to the customer. Director also can use this feedback to use that information to adjust and improve current and future actions and behaviours of this system.
Actors	Director
Preconditions	Director need to log into the system using director ID.
Main Flow	After receive feedback from the customer, The system will notify the director when get the feedback and the director can view the feedback by pressing “View Feedback” to see the message given by the customer. The system will separate feedback that already views and not.
Alternative Flows	If the director chooses to not view feedback to the system, then the director can press the “X” button to close the system. The system will not to be shown the feedback to the director
Postconditions	Director can press ”Next” button to read another feedback and press “X” button to close view feedback

7. Activity Diagrams

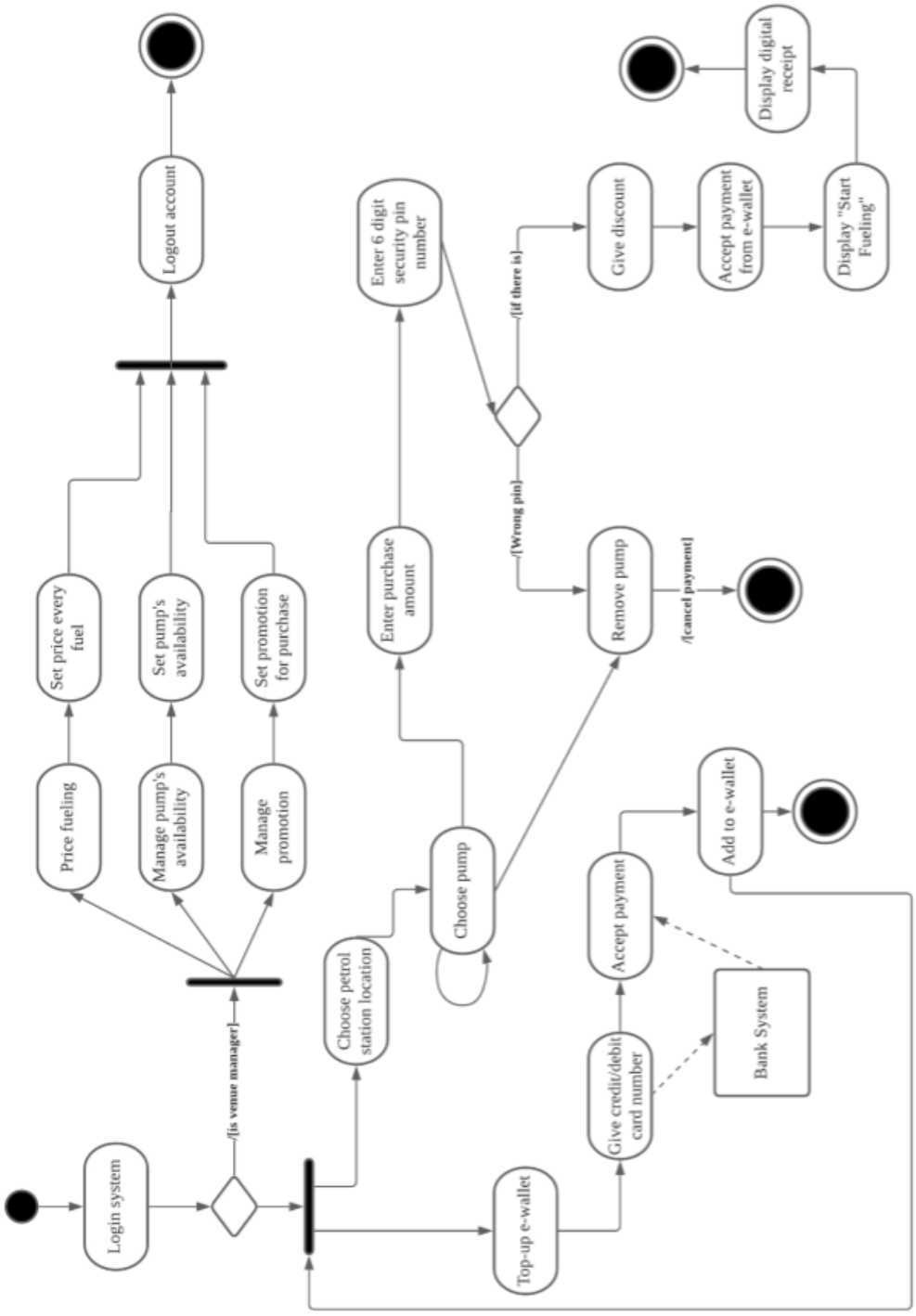

Diagram 3 : OPSPS Activity Diagram

8. Class Diagrams

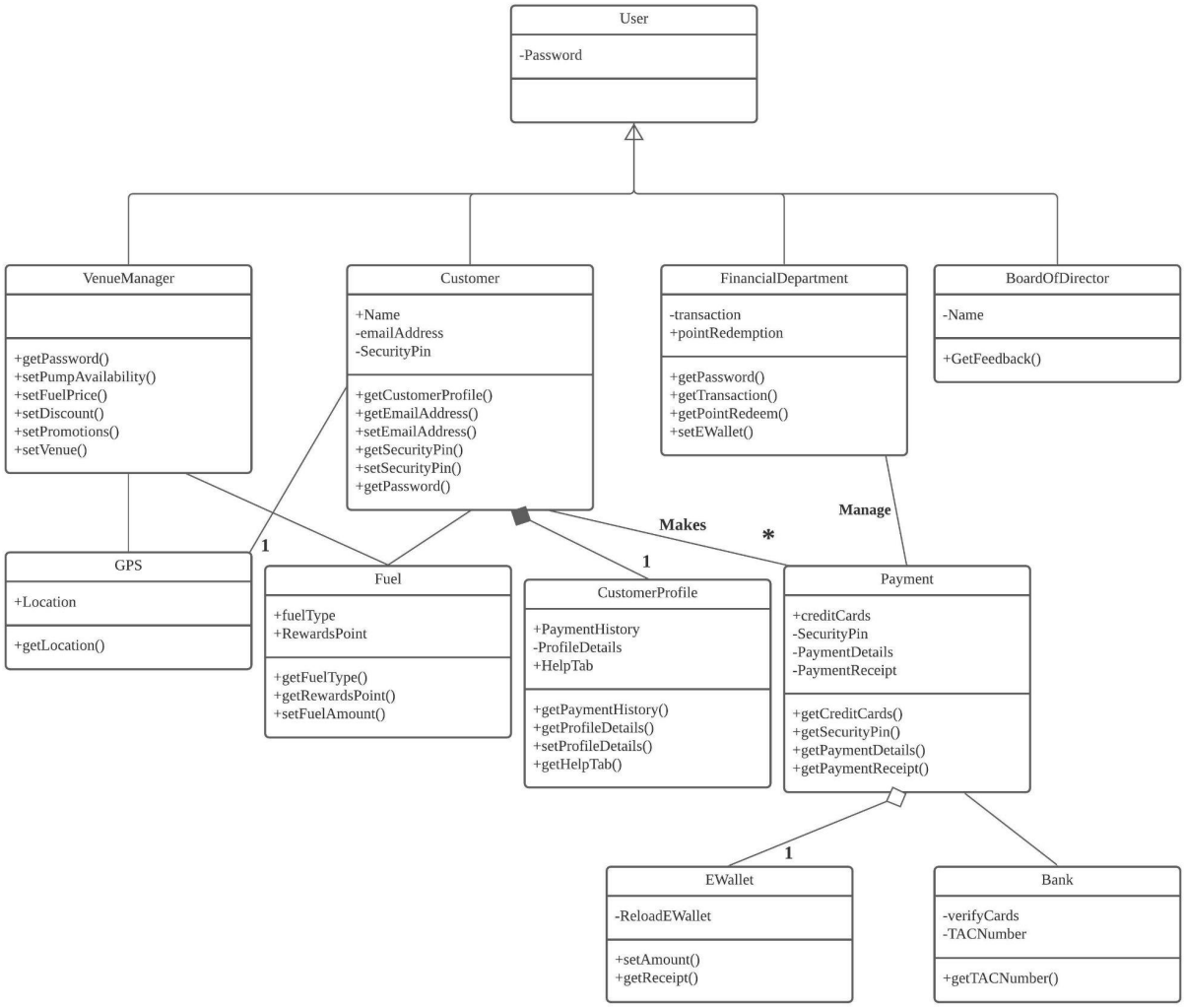

Diagram 4: OPSPS Class Diagram

Appendices

Board Of Directors
Individuals who hold the highest rank in OPSPS.

Customers
Individuals who intended to buy fuel from a certain petrol station.

Venue Managers
Individuals who manage the price and availability of fuel in a certain petrol station.

Feedback
Customers' opinions concerning the effectiveness of the system

Global Positioning System (GPS)
a satellite-based radionavigation system owned by the United States government and operated by the United States Space Force.

License
An official permission or permit to do, use, or own something.

Transactions (financial)
An agreement, or communication, carried out between a buyer and a seller to exchange an asset for payment.

Availability
The degree to which a system, subsystem or equipment is in a specified operable and committable state at the start of a mission, when the mission is called for at an unknown

Verification
Evidence that establishes or confirms the accuracy or truth of something

Online Petrol Station Payment System (OPSPS)
A system that is intended to be delivered to improve the payment process during fuelling the vehicles and minimize time consuming.

Operator Department
A department that needs to ensure the production of the system is completed from the beginning until the end also needs to make sure the employees systematically perform the task well.

References

1. Setel - Pay for fuel from the safety of your vehicle. (2020). Retrieved June 27, 2021, from Setel website: https://www.setel.my/