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e –Water Transportation Management System

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Abstract: Water transportation management was created to accommodate the transportation of the water to the customer especially in rural access which have limited access to the clean water supply. The existing system of transportation water seems to be inconvenience which customer needs to take a queue to get the water at the available water station. Thus, a solution must be proposed to ensure the effectiveness in the transportation of fresh and clean water directly to the customer. The main objectives of the proposed system are to design, develop and test e – Water Transportation Management System and the scopes of the project will be involving the customer, transporter, and administrator as the user for this proposed system. The tools in developing the system are Xampp, MySQL and PHP as the programming language. The methodology used in the project is Waterfall Development Model. As a conclusion, e – Water Management System will increase the effectiveness in transporting the fresh and clean water directly to the customer efficiently through the transporter through this Web-based system.

Keywords: Water transportation, customer, Web-based system.

1. Introduction

Purified water is the most essential in our daily life. Every human need clean and fresh water not only for drinking, but also for household activities and others. Without purified water, human will be unable to live properly and could facing many problems especially in rural areas that do not have lot of water supply and lack of quality. By using the internet and technology, transportation of water could be easier for the user to get their clean water directly to their home.

The existing system for water transportation usually conducted manually. The people need to bring down their own water bottles to get the water and need to queue at available purified water station. By using this system, it could help the people to get their water easily during crisis of water, especially in the rural areas. Disadvantages of this manual system are, it will be taking a lot of time to get the water and inconvenient as they need to bring the heavy water bottles back to their home.

E-Water transportation system was created to accommodate the transportation water to the customer especially in rural areas as they have limited access to the clean water supply. Plus, this system can be used by public people including students to get the water from the registered runner or

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transporter. This system also could provide cash on delivery (COD) and online banking methods for the fee.

This proposed system is an effective way to improve the existing manual water transportation process as it can accommodate people to get clean water especially from rural areas or areas that facing difficulty on water supply. The transportation could get the water through available water station before deliver to the customer.

2. Related Work

2.1 Transportation Management System

E-Water Transportation Management system is a system that focusing on the transportation of water directly to the customer through the transporter. This system will be managed by the administrator who is responsible on preparing the convenient and user-friendly system to assist the customer when buying the water just making the order through the system. Compare with the manual process, the customer will take a lot of time and money for the self-transportation when buying the water at the water station. The main reason for this system is to help the customer on buying the water through the transporter through the system in online method.

2.2 Web-Based e-Water Transportation Management System

E-Water Transportation Management system will be using Web Technology method. Usually, Web developer would implement this technology on developing the Web-based system. It is also well-known technology other than Android which is Operating System developed by Google. Web technologies are the tools and techniques that utilised in the process of communication between all type of devices and the Internet. All the system in this world would using Internet as the medium with multiple languages and frameworks, databases, protocols, and others.

2.3 Comparison of the Existing system with the proposed system

This section will be discussing about the existing water delivery system that already implemented in Malaysia. The comparison will be made to analyze the best features and method to be added to improve the proposed system.

Table 1: Comparison of existing system with the proposed project

Features/System	Spritzer Delivery System	Cactus Marketing Delivery System	Jantzen	E-Water Transportation Management System
Technology	Web Based & Android	Web Based	Web Based	Web Based
Registration	√	√	√	√
Login	√	√	√	√
Verification	√	√	√	√
Notification	√	√	√	√
Product	Spritzer Natural Mineral & Carbonated Water	Cactus Drinking & Mineral water.	Jantzen Mineral & Drinking water.	Mineral & Drinking
Area Coverage	Klang Valley, Penang, and selected areas of Perak only	Klang Valley only	Kuala Lumpur only	Pedas, Negeri Sembilan
Target Customer	Household	Household	Household & Corporates	Household
Delivery Vehicle	Lorry	Lorry	Lorry	Depend on the transporter vehicle
Payment Option	Online Banking or Cash on Delivery (COD)	Online Banking	Online Banking	Online Banking and Cash on Delivery (COD)

3. Methodology/Framework

The waterfall model is sequential software development model which the development process is seen as flowing downward (waterfall) through several process. This methodology was proposed by Winston W. Royce [3] to explain about software engineering that will probably use [3]. The reason on choosing this model was because each phase in waterfall model has distinct goals for each and need to focus and complete on one phase before moving on the next phase. On the other hand, it is easy to understand and construct due to its linear framework.

In Waterfall Model, it consists of 5 phases to involved to complete the project which start from Planning, Analysis, Design, Implementation and Maintenance. The process is what we will call as System Development Life Cycle (SDLC).

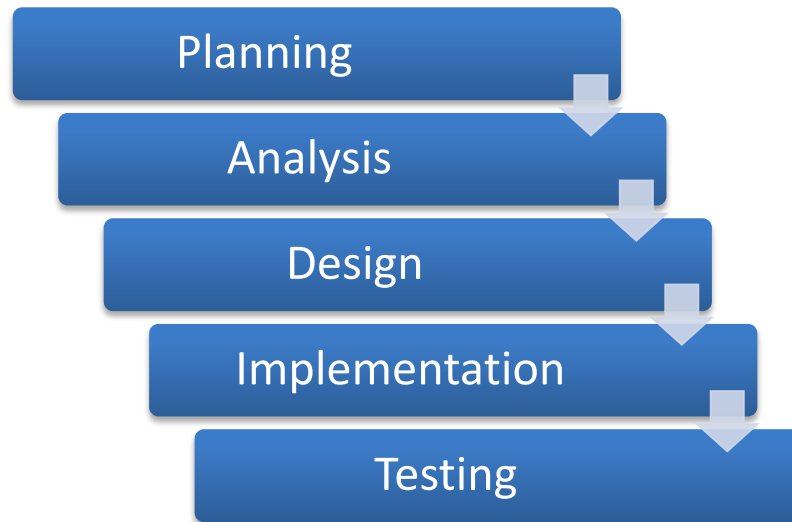


Figure 1: Phases in Waterfall Model

3.1 Registration Module for the Customer (Main User)

Figure below shows the registration page for the new user who want to use the system. The important details that need to be include are name, email, password and phone number. The new user will be verified through email by administrator so that they can access the system later.

SHOP ABOUT CONTACT US

[Login](#) | [Register](#)

Figure 2: Registration Module

3.2 Login Module

Figure 3 shows the login interface of login process for the customer. The existing customer just need to login by using registered password and email before can access the system while for new user, they need to register first. The function in this page are login and account registration of the customer.

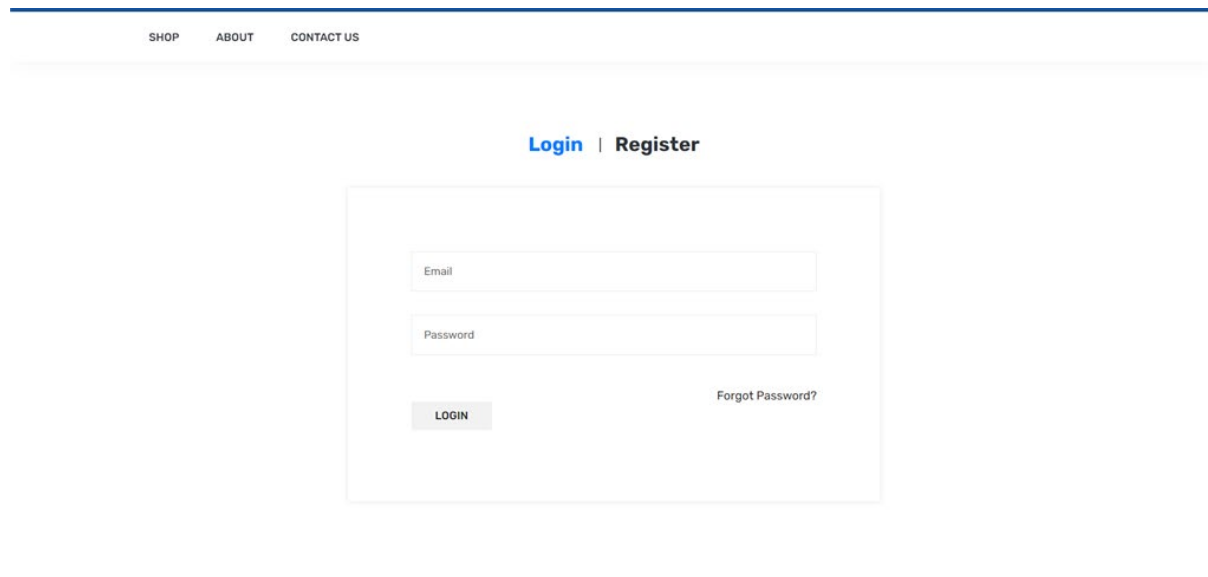


Figure 3: Login Module for Customer

Figure 4 shows the login interface of login process for the customer. The admin just needs to login by using username and password before can access the system.

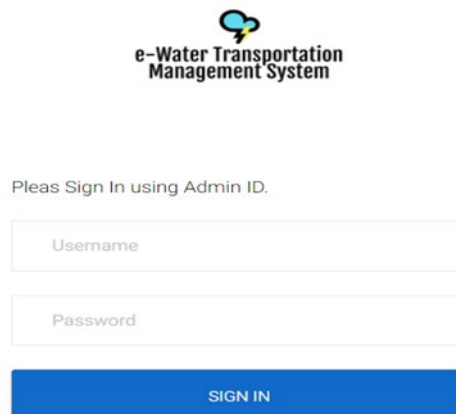


Figure 4: Login Module for the Administrator

3.3 Shop Module

This page will display the item which is available for the customer to buy or order. The water can be browsing into two categories which are brand and water type. The brand included are Spritzer, Bleu, Dasani and more while for type of water consists of drinking water and mineral water. The customer

also can search the item by using the search engine provided in this page. Plus, all the item is update by the administrator in item module.

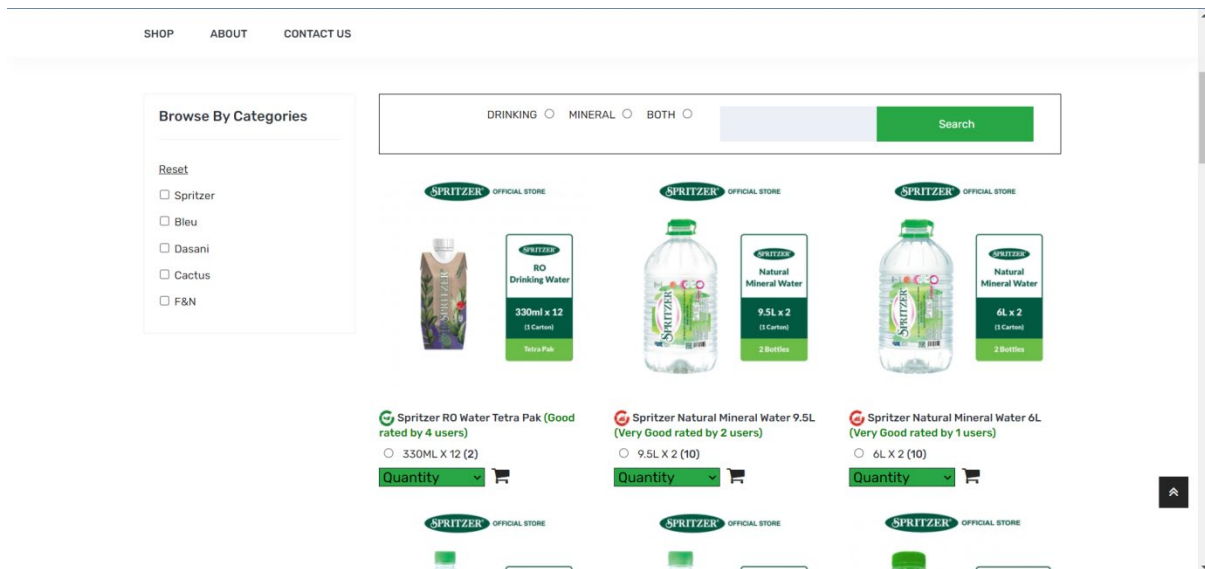


Figure 5: Shop Module

3.4 Item Module

The figure below shows the page for item section which can be update by the administrator. The admin needs to register the item and insert their details before display to the customer. Also, the details included are category, water brand, image, time added and action’s function. The actions button will act to edit the item availability based on the stock of the item. Active button will display the item while for deactivate button will hide the item from the customer page in shop section.

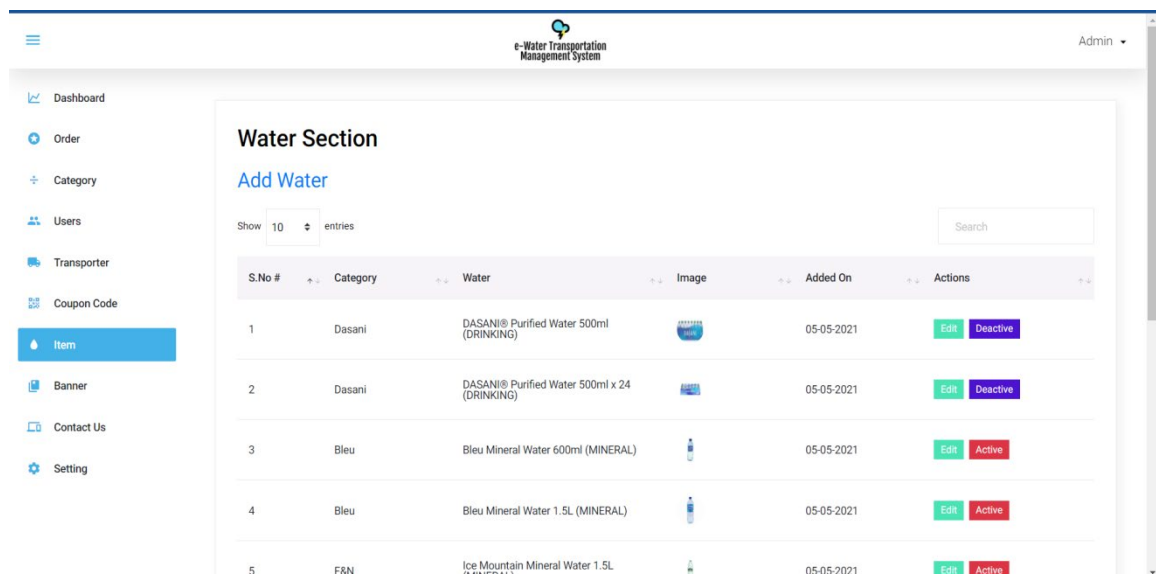


Figure 6: Item Module

3.5 Transporter Module

The interface is to provide the transporter the details of the customer’s order. The transporter can perform the check of the item ordered and responsible to deliver the item directly to the customer. The transporter only needs to login by using mobile number and password after being registered by the admin. Figure7& 8 shows the ordered details by the customer and had been assigned by the admin for the transporter.

Figure 7: Transporter Module

Order Id	Name/Mobile	Address/Zipcode	Price	Payment Type	Payment Status	Order Status	Added On
21	Wan Kamaruddin 0157863459	NO 147 RUMAH RAKYAT FASA 2 LUBOK CHINA 71150	200	wallet	Success	Set Delivered	13-06-2021 03:28

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Figure 8: Transporter Main Interface module

3.6 Invoice Module

The figures below show the invoice module display in admin page. It will show the details of order item, customer details and total price. Customer can download the invoice in PDF format at customer page.

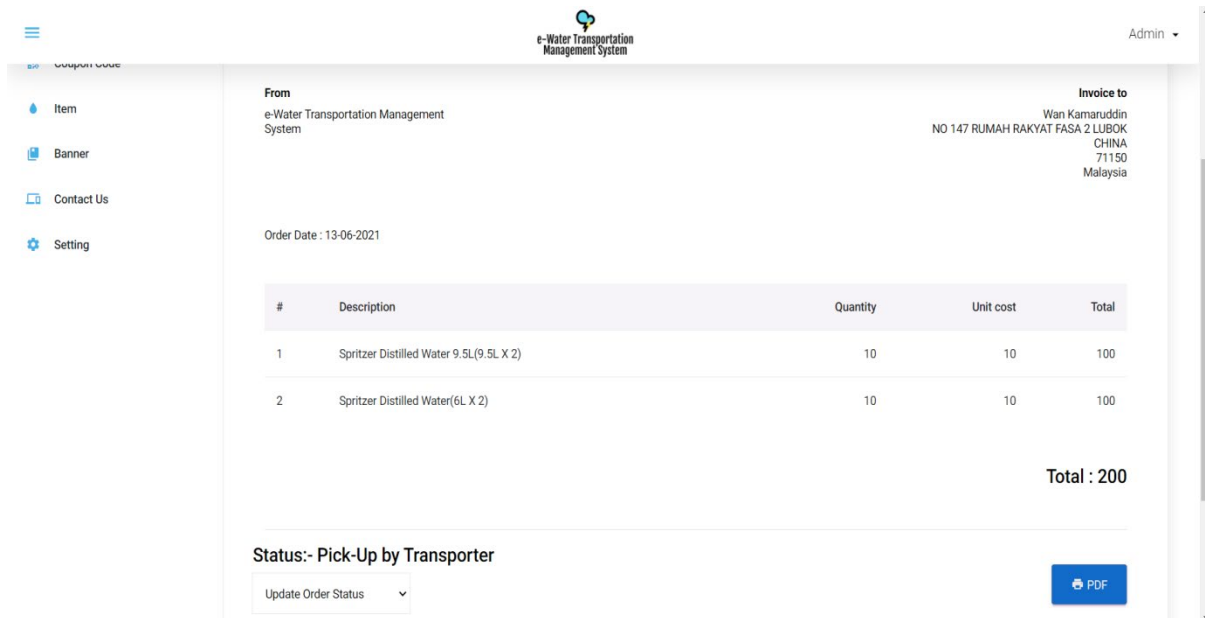


Figure 9: Invoice Module

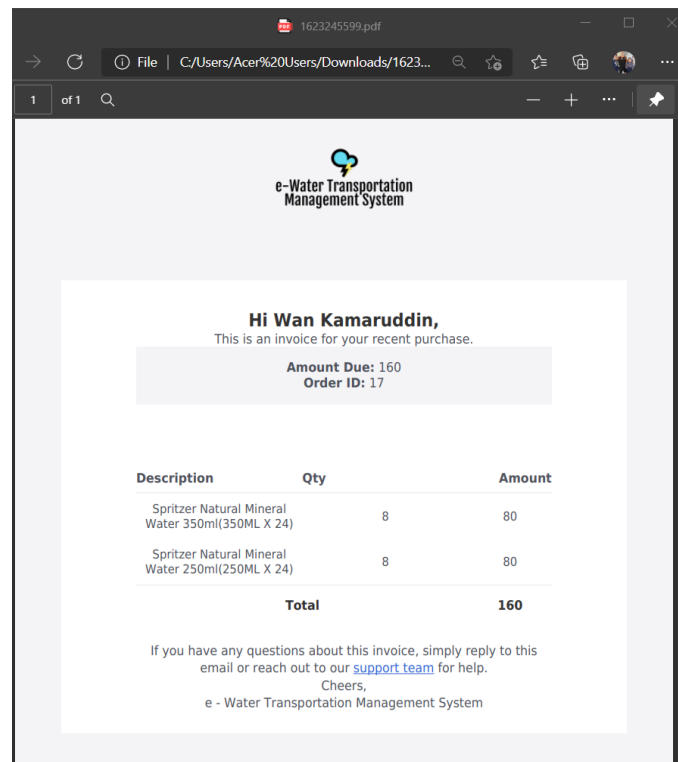


Figure 10: Invoice in PDF Format

3.7 Payment Module

The customer can make the payment in the payment module and can select 3 options of the payment type such as COD, online banking and E-wallet. The coupon section can allow the customer to insert the coupon code if any promotions or events occur. This module will require user to enter their details for the delivery process and total price that need to be pay.

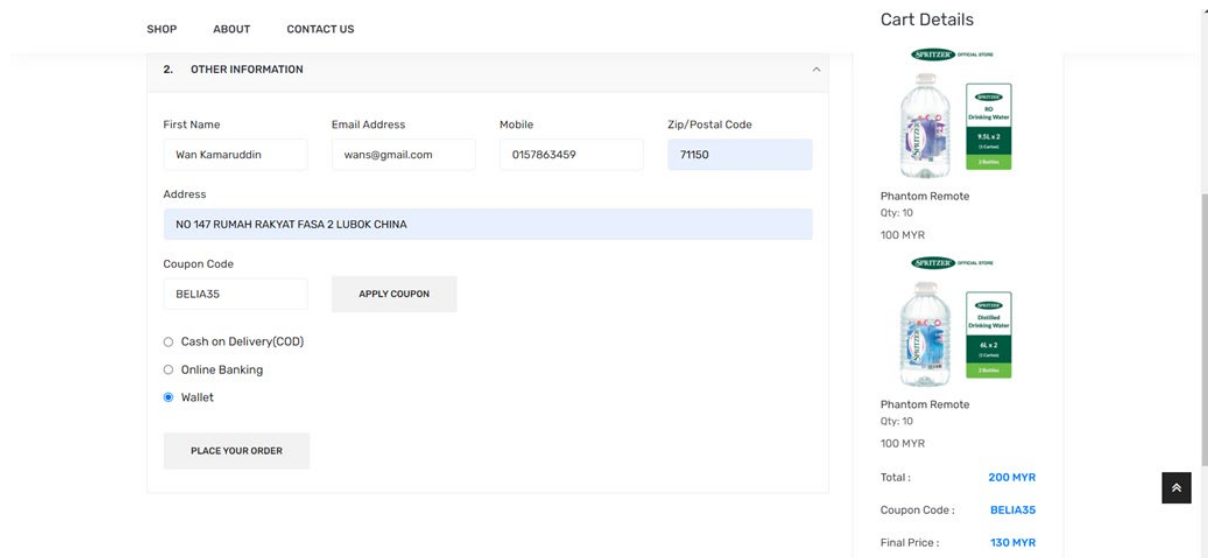


Figure 11: Payment Module

3.8 Coupon Module

The admin inserts, delete or remove the coupon code if they want to make a promotion or event sale to the customer. The customer can directly enter the code at the coupon section before proceeding to make the payment and have their price discounted. The code has their own details which can be use based on the situation or cart minimum price.

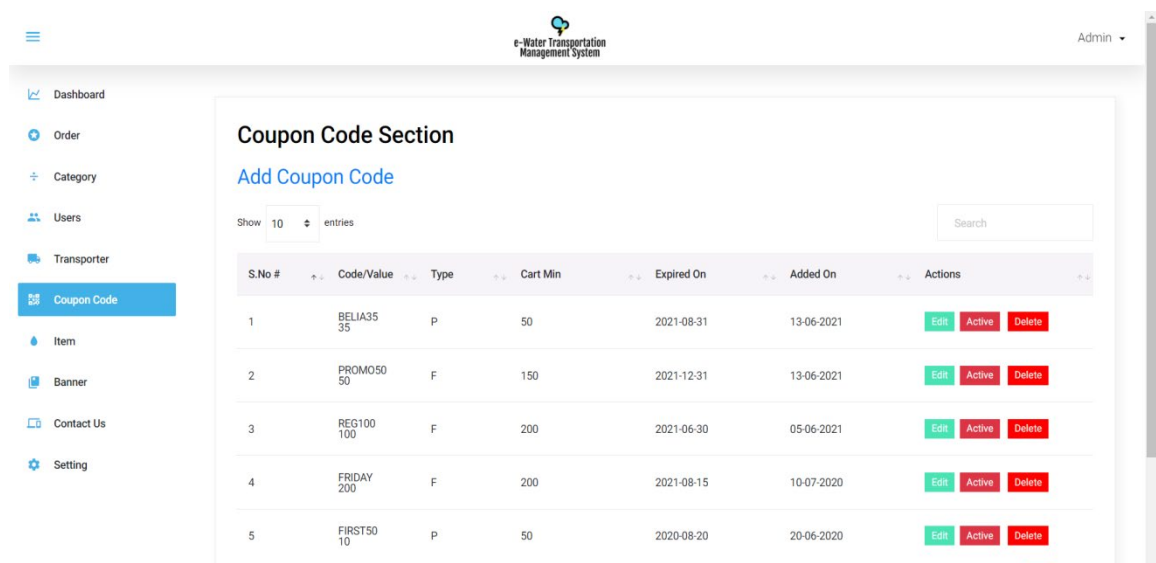


Figure 12: Coupon Module

4. Results and Discussion

Requirement analysis is the process by which user's requirements will be collect and gather before developing the system. This will be including all the activities such as evaluating, recording, validating, and handling software and hardware requirements. Meanwhile, design process is to search possible functional and non-functional requirement before designing the framework on how the system should works.

4.1 Functional and Non-functional requirements of the system

Table below shows the functional and non-functional specifications of the system to be created for the Web-based water transportation management system. It will explain the details of the system functionality which is important for project development.

Table 2: Functional Requirements

No	Modules	Functionalities
1	Login	The system should allow the customers to login using username/id and password. The system should allow the customer to input valid userID and password to login as the user. The systems should inform the customer if entering the wrong input. The system should redirect the customer into the user's dashboard.
2	Registration	The system should allow the new user to register before login. The system should alert the customer if the new users want to use the same username to avoid duplicate. The system should give suggestions for the passwords.
3	Order	The system should allow the customer to order the water. The system should show the list of the product that can be buy. The system should allow the customers to buy/pay for the ordered water.
4	Transportation	The system should allow the transporter to transport the water directly to the customer
5	Payment	The system should allow user to choose the payment method The system should allow user to make the payment through online
6	Invoice Generating	The system should generate the invoice to the customer for each of their order.

Table 3: Non-Functional Requirements

No	Modules	Functionalities
1	Performance	The system should be able to use anytime and anywhere. The communication between the user and the system should not be more than 5 minutes.
2	Operational	The system should be user-friendly. The system should always be maintained and keep up to date for the products (water). The system should be able to run on Web Browser such as Google Chrome and Mozilla Firefox.
3	Security	The system should allow only authorised user to login. The system allows only the administrator to generate the invoice. The system should ask the customer to enter ID and password to login again after inactivity for more than 10 minutes.

4.2 Data Flow Figure Level 0

Data flow Figure (DFD) is a data flow process describes a process that will happen during the development process of the system. The Figure will help to understand the process flow on developing the system. Data flow Figure Level 0 processes involved customer, transporter, and administrator as the entities. It will show the key processes in the system in details.

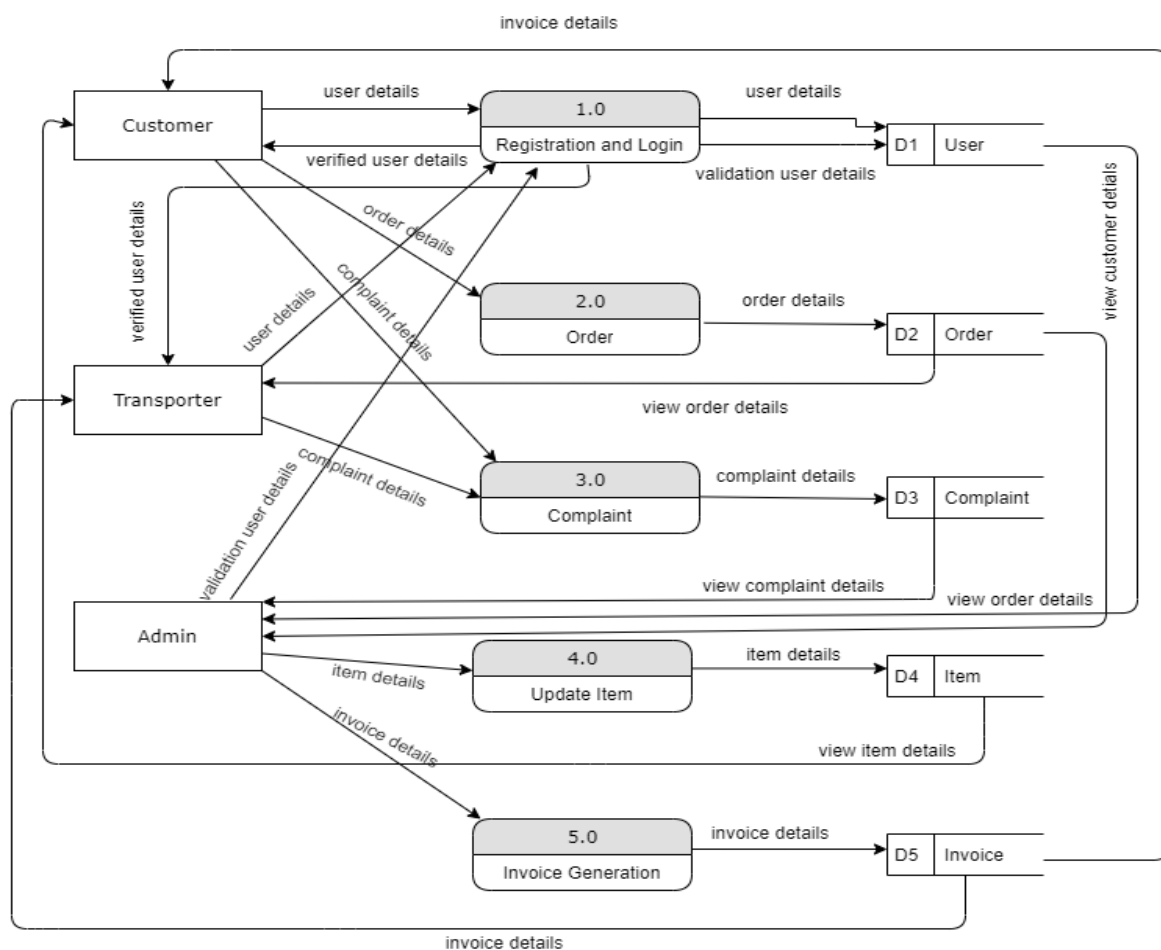


Figure 13: Data Flow Figure Level 0

4.3 Entity Relationship Figure (ERD)

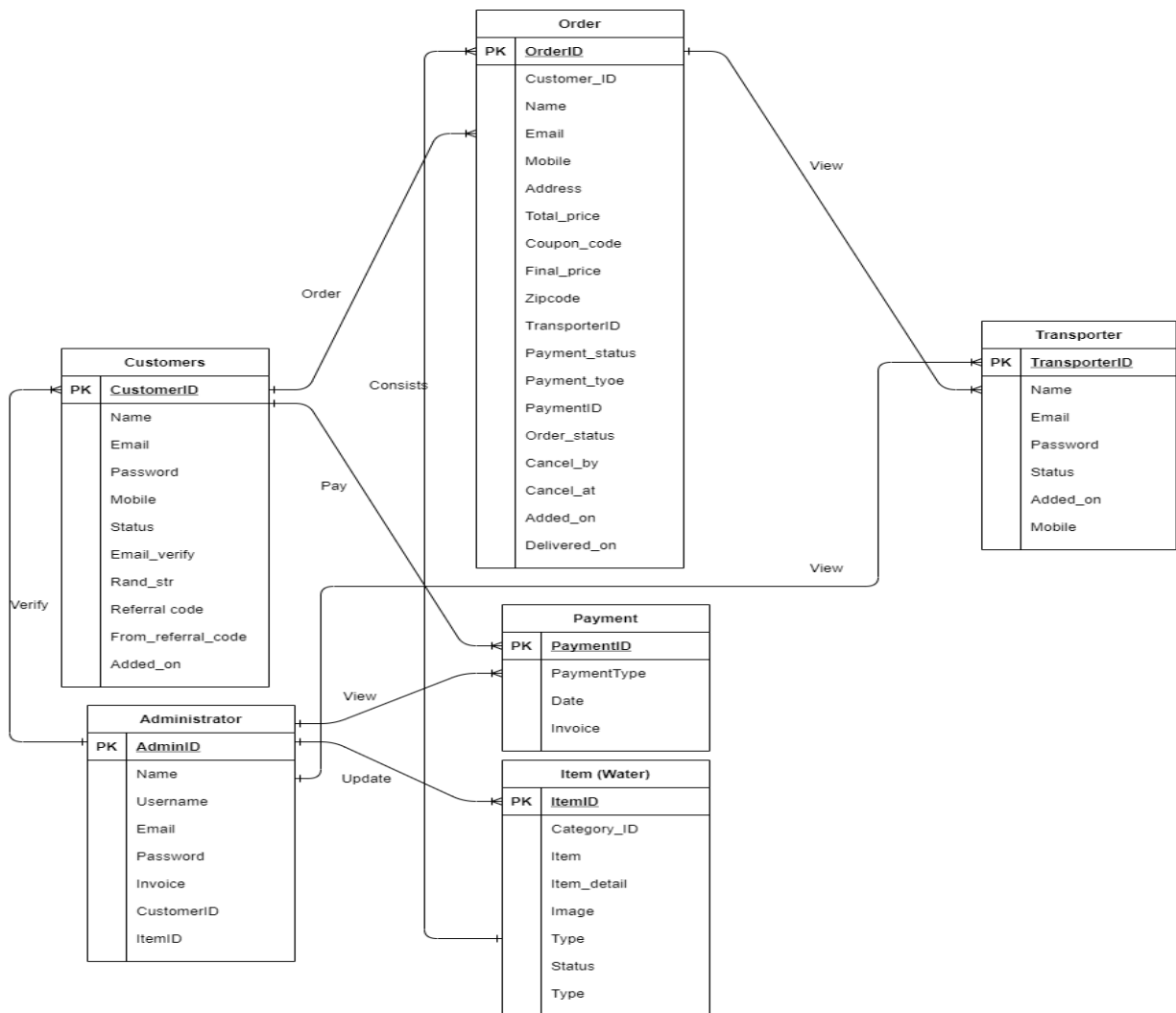


Figure 14: Entity Relationship Figure (ERD)

5. Conclusion

This report consists of four parts which are part 1, part 2, part 3, and part 4. Part 1 are to introduce the proposed system with their problem statement, objectives, and scope of the project. Besides, Part 2 includes a description of the study of the literature review such as study domain, information about the water transportation management system and comparison between the existing system with the proposed system. Then, Part 3 explains the methodology used for the project development. Finally, Part 4, explains about the analysis system requirements, system design, design database and interface design of the proposed system. As for conclusion, e-Water Transportation Management System was developed to improvise the manual way on getting the fresh water for the customer. This system can assist the user on just ordering the water from the system in much safer and easier way. The system successfully developed the 3 user modules which are the customer, admin and transporter with different functionality and features. Despite having some limitation regarding this project, several opinions from the user have asked for little improvement to maximize the potential of the system but the system is still can be acceptable and do not affect the system performance level.

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