

# A Smallholder Fish Trading Information System

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**Abstract:** The fish sales business is an important supply chain industry because it supplies the main food source to the people. Currently, information about sales transactions is managed by writing it in a ledger. When transaction data is handwritten on the record book, incorrect writing will inevitably occur. Therefore, a web-based system to handle the purchase transaction process, catch volume, and display each fish price per kilogram is proposed. Dedicated databases are also included to manage business data storage. The system provides a facility to record the catch which is an inventory of business stocks, dealer lists, sales records, and business analysis to allocate fish stocks to match the needs of traders. The system is used specifically by supplier, while buyers use the system to receive notifications from supplier if the fish harvest on that day meets their requirements, make invoices sent to supplier and check fish prices. Prototype models are used to facilitate project implementation. The programming language includes have PHP, HTML, CSS, while the MAMP and MySQL as the server and database. The process of this system is based on e-commerce methods and information systems. The need for e-commerce in this technological age is apparent, as it allows businesses to operate without regard to location or time limits. Eventually, this combination of e-commerce and web-based information systems can boost corporate efficiency and profitability at the same time.

**Keywords:** Object-oriented, fish trading, information system

## 1. Introduction

Malaysia's fisheries sector contributes significantly to the country's foreign exchange earnings and jobs. Fishermen go out to catch fish and sell the caught sea creatures to humans for consumption. [1]. Food obtained from animals is the main source of protein and include fish, milk, meat, poultry, and cheese[2]; [3]. Compared with meat, fish is a low-fat high-quality protein, rich in omega-3 fatty acids and vitamin D and B2 [4]. Fish is to obtain omega-3 fatty acids to keep the heart and brain healthy [5][6]. Fish trading is one of those trades in the world and become an increasingly popular choice [7] because of the need to meet the market demand of people. The purpose of choosing the business is to produce the good fresh seafood. This is because the people must have a good nutrient for their life to make sure there have a good life and healthy [8]. Fish food supply chain is needed by country and

people is because there is limitation to get some types of fish in own country, so the supply chain happens. Besides that, it increases the economics of the country [9].

The fish trade has existed from the beginning of time and has evolved over time. When a fisherman returns with a catch, it is usually classified into the appropriate category. This is done by the employee, who records the information about the catch in a book, including the type of fish caught and its weight. According to the orders that have been placed in advance, the supplier will allocate the fish to specific traders. On the day the fish is harvested, the supplier will contact the trader to see if the order has been completed. The merchant will send the invoice to the supplier and double-check that all parties have agreed on the purchase information. The merchant will make the payment if the information is agreed upon. Other merchants are subjected to the same procedure.

Currently, the fisheries sector especially in the case study of this project is still using manual method. Several issues exist because of this procedure; invoices may be lost inadvertently, which, while unlikely, should be avoided. It is easy to make content errors when recording transaction data by handwriting. The second issue is that there are no set trading hours, and many traders bringing in fish at the same time may cause traffic congestion. The fourth issue is that although transaction data is stored by date, generating monthly reports by supplier clerks takes time.

Therefore, a web-based system to handle the purchase transaction, catch or fish harvest volume, and display fish price per kilogram is proposed. A dedicated database is also included to manage the storage of business data. The system has two users, namely supplier and traders, who can use the system while conducting transactions. The system offers several advantages, firstly, invoices can be automatically generated by the system. Secondly, the trading hours can be chosen by the traders to avoid congestion. Third, the system has stock names and prices for users to click to add stocks when generating invoices. Finally, transaction records are recorded under each trader's name, so the clerk can easily produce monthly reports. The process of this system is based on e-commerce methods and information systems because it has specific methods that can support the implementation of new systems.

There are five sections contained in this paper. The background of the project is described in Section 1. Work in the fisheries sector and studies on similar current systems are provided in Section 2. System development methodology is described in Section 3. Results and discussions are presented in Section 4. Finally, conclusions are provided in Section 5.

## **2. Related Work**

Supermarkets, hawkers, frozen shops, etc. are the sources of fish resources for humans, but the main resources come from the fishery industry. Fisheries can mean either the enterprise of rearing or harvesting fish and other aquatic life. commercial fishing is the activity of fishing/taking fish and other seafood as well as resources from the oceans, rivers, and lakes for the purpose of marketing [10]. The fishery is the supplier of all shops or restaurants that need fish. The fishery is doing business trading fish to traders such as hawkers, freezer shops and so on. The individuals involved in this business are entrepreneurs, workers, and fishermen. Fishermen will go out fishing within the allotted time and find an appropriate area to place the nets based on the weather on the day. The fishermen will then wait until it is the appropriate time to raise the net. The fisherman captures the fish in a huge basket that is tied when the reel is in the net. The big basket was then slowly lifted and placed on the boat, with the assistance of a machine, and distributed in various storage places. When all the nets have been collected, the fishermen will be ready to return to the jetty.

The fishing industry in Hutang Melintang, Perak, is the case study for this project. There was only one fishing boat at first, and only a few workers went out to sea to fish. However, as time passes, the company grows larger and larger. The fisheries sector includes not only a few but also many traders, such as QL Food Sdn. Bhd., as well as hawkers selling fish in the market, freezing stores, and so on. As

a result, the owner increased his team to almost forty workers and now operates four fishing boats. The fishery revenue by selling fish to hawkers, freezer shops, and other businesses. Since the business operation and its data still recorded manually in the book, a software system with a database is required to handle information in business processes and manage data efficiently.

In this project, Web-based Information System (WBIS), which is more user-friendly, was utilized in the development of the new system. This is because WBIS provides cross-platform, multiple concurrent users and additional features that bring advantages to the system. A WBIS is an information system that uses internet networking technology to provide information and services to users [11]. It is a software system that uses hypertext principles to fix data. The database is used as the back end and the web browser is used as the front end of the WBIS [11]. On the other hand, E-commerce (electronic commerce) refers to the purchasing and selling of goods and services, as well as the transmission of payments and data, over an electronic network, most commonly the internet [12]. It is a system in which both sales offer, and acceptances are made electronically. Compared to traditional retail, e-commerce allows businesses to reach a larger number of people. Finally, because the features provided suit the objectives of the new system, both web-based information systems and e-commerce methods will be used in the development of new systems.

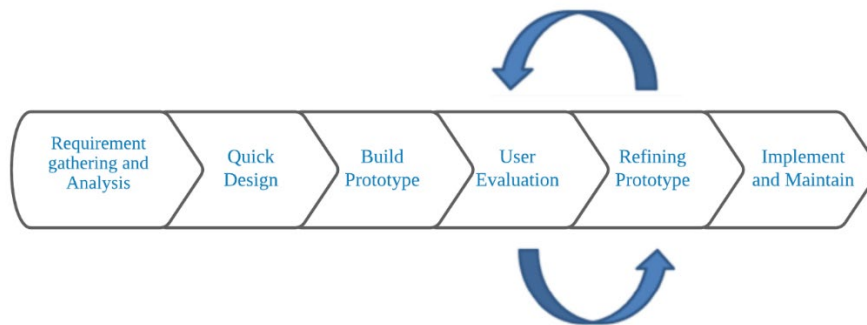
**Table 1: System's Comparison**

System Features	Piau Kee Live & Frozen Seafoods Sdn. Bhd.	Bakulan Ville Ventures (Seafood)	Platinum Marine Products Sdn. Bhd.	Fish Trading Information System for Smallholder
Registration and Log in Module	Not available	Not available	Not available	Supplier and trader are able have own account to log in
Report Module	The types of seafood provided are listed on the webpage, but users need to place an order through the physical store	The price of seafood will be listed per gram. Users need to place an order through WhatsApp	The types of seafood provided are listed on the webpage, but users need to place an order through the physical store	Clerk creates the new type of fish with the price and create the daily harvested data. Supplier can edit and delete the data if have error.
Assign Module	Not available	Not available	Not available	Clerk allocates order to trader and message them via WhatsApp. Traders pick up the fish stock at the fishery industry.
Invoice Module	Not available	Not available	Not available	The invoice and receipt for each order will be uploaded and saved as a proof
Report Module	Not available	Not available	Not available	Supplier's clerk can make monthly report based on the selected duration

A comparison study between the existing system and the proposed system is also conducted to see the good features found in the existing system and is summarized in **Table 1**. The proposed system has

its own unique features that are suitable for this case study. This system proposes a mix of modules from several different system versions. The new system's components include a variety of functions and are more commonly employed for online business procedures. The three existing systems are substantially different from the proposed system, except for the assign module. The consumer must visit a physical store to purchase or pick up fish inventory, and the products are advertised on the web page. Due to the diverse purposes of constructing the systems, none of the existing systems contain additional modules. The system was created to make it simple for supplier, clerk, and traders to keep track of bills, generate monthly reports, and communicate with traders once the fish stock was allocated.

### 3. Methodology



**Figure 1: Prototyping model**

A prototype model, shows in **Figure 1** is a software development approach in which a prototype is constructed, tested, and reworked until it is satisfactory [13][14]. It is used as a prototype and is accepted by the user before the final system is developed. It is a way of communication between developers and clients that is iterative and based on trial and error [15]. Users can use this model to see if the system code matches the specification and refine it.

**Table 2: System functional module**

No.	Module	Function	User
1.	Registration and Login Module	Supplier will register account for clerk and the clerk will register account for trader. Login the system by the account id and the password.	Supplier, Clerk, Trader
2.	Record module	Clerk creates fish type and daily harvested data. Supplier can view whole fish type and the harvested data and can edit or delete the data.	Supplier, Clerk
3.	Assign module	To assign fish orders to the trader and inform them by WhatsApp trader will receive message from clerk to confirm the assign orders and choose the transaction time	Supplier, Clerk, Trader
4.	Invoice module	To create the invoice in pdf and upload invoice and receipt to system. Status payment update by supplier, trader can check the status. Clerk can view records.	Supplier, Clerk, Trader
5.	Report module	To generate monthly report and view and upload to system.	Supplier, Clerk

#### 3.1 Requirement Gathering and Analysis Phase

The first phase is requirement collection and analysis. During this phase, interviews are conducted with supplier and summaries the content in Google Docs. Results from interviews and observations were used to clarify system requirements. Class diagrams and use case diagrams are generated to list the functions of users and their modules.

(i) System requirements

**Table 2** gives the system functional module. **Table 3** about the functional requirements. **Table 4** is non-functional requirements of the developed system.

**Table 3: Functional requirements**

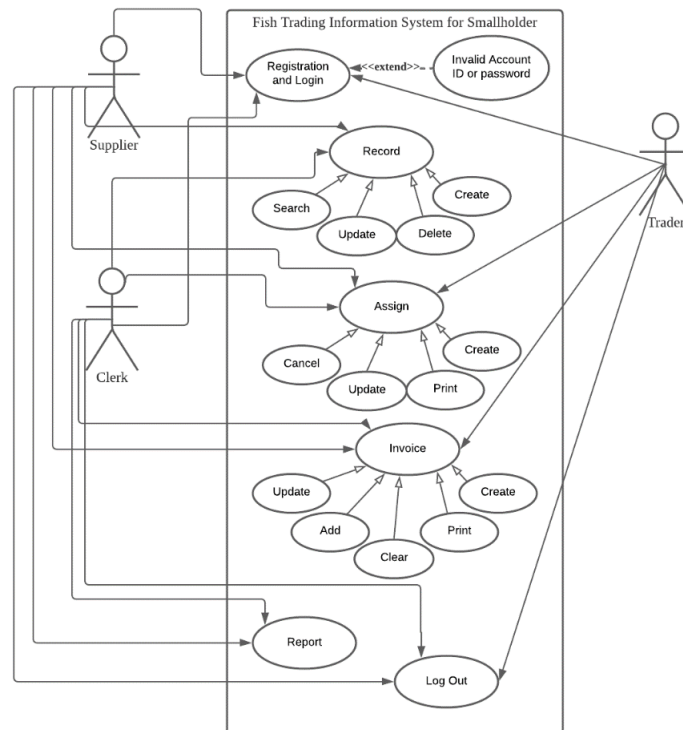
No	Module	Description
1.	Registration and Log in Module	<ul style="list-style-type: none"> <li>• The system should allow supplier to register new account for the clerk.</li> <li>• The system should allow clerk to register new account for the trader.</li> <li>• The system should only allow users to login to account with a valid account id and password.</li> <li>• The system should alert the user for any invalid input.</li> <li>• The system should redirect user to that respective main menu upon successful login.</li> </ul>
2.	Record Module	<ul style="list-style-type: none"> <li>• The system should allow clerk to create type of fish and the prices of each.</li> <li>• The system should allow clerk to create daily harvested data.</li> <li>• The system must enable the supplier to update the information on the type of fish and fish harvested.</li> <li>• The system should allow the supplier to search the data by the keyword.</li> <li>• The system should allow the supplier to print out the daily harvested data as daily report.</li> <li>• The system should allow the supplier to upload the daily report into the database.</li> <li>• The system should alert the supplier once the report is upload success or fail.</li> </ul>
3.	Report module	<ul style="list-style-type: none"> <li>• The system should allow clerk to message the trader once have fish stock assign to them.</li> <li>• The system should allow trader to contact clerk once they have problem.</li> <li>• The system should allow trader to check the assign fish stock list.</li> <li>• The system should allow the trader to cancel the assign file.</li> <li>• The system should allow the clerk to change the transaction time.</li> </ul>
4.	Invoice module	<ul style="list-style-type: none"> <li>• The system should allow the trader to generate an invoice about the fish stock that received.</li> <li>• The system should allow supplier to delete the error invoice and receipt file once have error.</li> <li>• The system should allow trader to upload the invoice and receipt file as pdf to the system when there is empty in the column.</li> <li>• The system should allow supplier to view after the trader upload the receipt.</li> <li>• The system should allow the trader to check the status of the payment whether is state “Successful” or “Pending”.</li> <li>• The system should allow the supplier to confirm the payment of invoice and update in the system at the same time.</li> <li>• The system should allow the supplier to view the invoice any time.</li> </ul>
5.	Report module	<ul style="list-style-type: none"> <li>• The system should allow the clerk to generate the monthly report, view the transaction record of every trader in the selected duration.</li> <li>• The system should allow to print the report in pdf.</li> </ul>

**Table 4: Non-functional requirements of the developed system**

No	Requirements	Description
1.	Performance	The system should be always usable
2.	Operational	The loading time required for a website is no more than 2 minutes
3.	Security	The system should be user friendly

(ii) System analysis

Analysis is performed by using object-oriented approach. UML use case diagrams are the primary form of system requirements for new system programs under development [16]. A use case specifies the anticipation behavior, which can be represented both textually and visually through use case diagram. Use case modelling helps to design a system from the end user's perspective. **Figure 2** shows the proposed system use case diagram, the Fish Trading Information System for Smallholder. The users for the system are supplier, clerk, and trader.



**Figure 2: Use Case Diagram**

**Figure 3** is class diagram for the system. Supplier, clerk, and trader are the user in the system who sharing some attributes and methods such as login (). As a clerk, clerk will create the fish type category and it will store in the “f\_category” table in database. While the supplier can manage the category of fish type. The methods include are create (), update (), delete (), and search (). Besides that, clerk need to create the daily harvested data which will store in the “f\_daily” table by getting the database from the ‘f\_category’ table and the supplier also manage the data.

After the harvested data is stored in the database, the clerk will start produce assign file which assign the fish stock to the trader. When clerk generate the file, clerk will refer to the “f\_daily” table for purpose to assign optimize without wasting or out of the quantity. The assign file will store in a table name “f\_assign”, with the selected trader and file in pdf format. So, the trader can view or cancel the order, and the supplier can also view the details of assign content. The shared methods are create (), print (), update () and cancel ().

“f\_invoice” table is to store the invoice file and receipt file that the trader uploaded. It refers to the “f\_assign” table to check the elements are correct. Supplier can update the status payment once the files are uploaded, and the clerk can view the transaction records of all traders. The clerk also responsibility to create monthly report and store in “f\_report” table, while the supplier will produce daily report and store into same place. Monthly report is referring to the transaction records that successful.

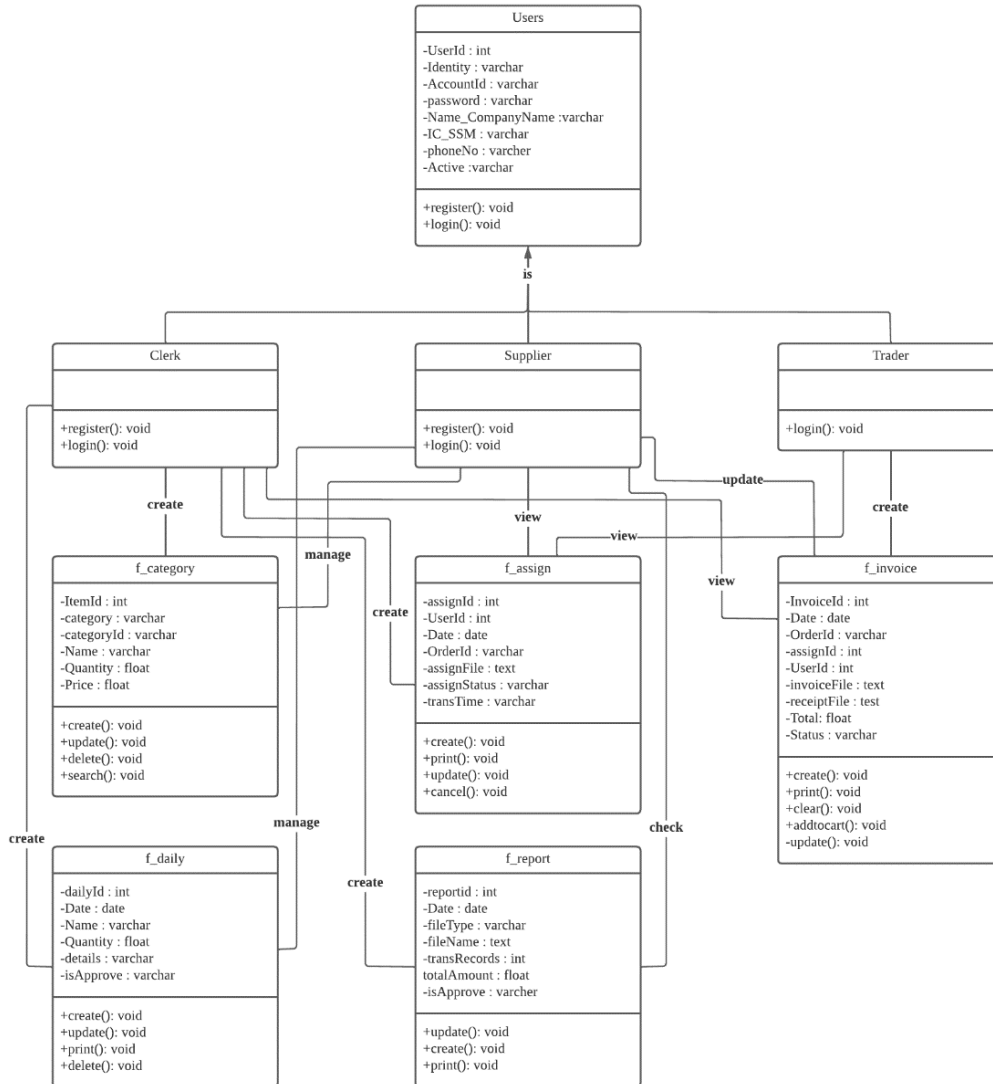


Figure 3: Class Diagram

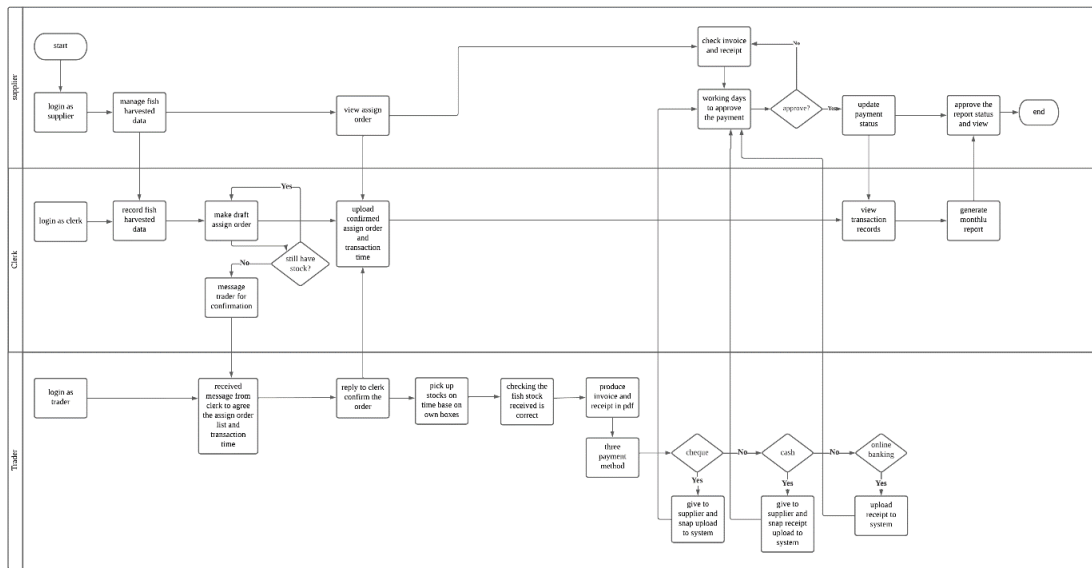


Figure 4: Swimlane diagram

Figure 4 is Swimlane diagram which explains the flow of the system. There are several modules that are required in the proposed system, as described in Table 3. Users can login to their account. Next, the clerk will record the fish volumes of that day and manage orders and assign fish stocks to traders based on the day's harvest and the trader's requirements through the system. The trader will need to choose the transaction time when confirming the assign order with the clerk to schedule a pickup. After that, the trader will create an invoice in the system for the order. There are 3 methods available for traders to pay invoices.

Any receipts on each invoice will be updated into the system by the trader in pdf format, it will take some working days for the supplier to approve the payment. Finally, all transaction records will be stored in the system and generated in pdf format. Users can view them at any time, especially for supplier and clerk. When the clerk produces monthly reports, the invoices can be displayed according to the selected keyword to facilitate the staff's work and save time. The report will also be generated in the system in pdf format. The flow of the system is as the Figure 4.

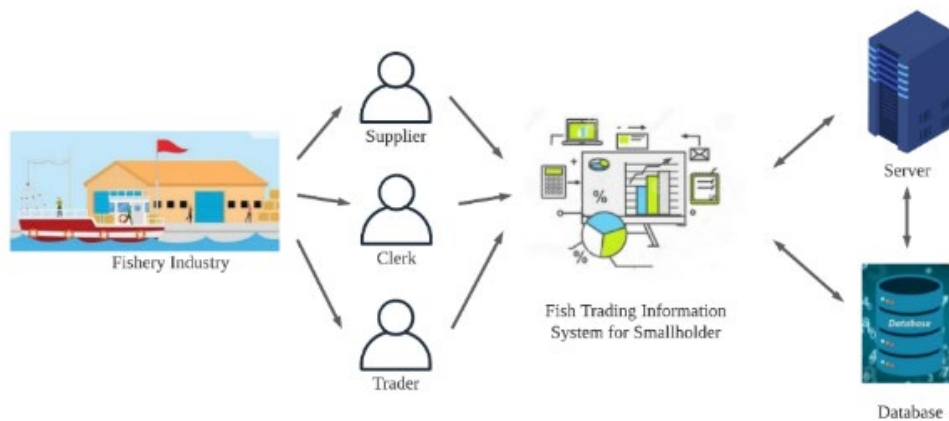


Figure 5: System Architecture



### 3.2 Quick Design Phase

Rapid design is the second phase. Each module will have a brief system design for the client to observe, and each module will be explained for enhanced understanding. A design will be made and sent to the client. The design includes system architecture, database design and user interface design. **Figure 5** is the system architecture of the system. It defines the behavior, structure, and visual representation of the system.

The schema for the database is as follows:

- i. f\_users (UserId, Identity, AccountId, password, Name\_CompanyName, IC\_SSM, phoneNo, Active)
- ii. f\_category (ItemId, category, categoryId, Name, Quantity, Price)
- iii. f\_assign (assignId, UserId, Date, OrderId, assignFile, assignStatus, transTime)
- iv. f\_daily (dailyId, Date, Name, Quantity, details, isApprove)
- v. f\_invoice (InvoiceId, Date, OrderId, assignId, UserId, invoiceFile, receiptFile, Total, Status)
- vi. f\_report (reportid, Date, fileType, fileName, transRecords, totalAmount, isApprove)

**Figure 6** and **Figure 7** illustrates the user interface design about the assign module for clerk uses. **Figure 8** and **Figure 9** is user interface design for invoice module, **Figure 8** is for clerk uses and **Figure 9** is for trader uses.

assign fish stock			
fish tyoe	price	quantity	Action
a	10	1	add to cart
b	2	1	add to cart

**Figure 6: Assign fish stock for clerk**

Assign details					
date					
trader					
No	item name	quantity	price	total	Action
1	a	1	10	10	Remove
2	b	12	2	24	Remove

**Figure 7: Assign fish details list for clerk**

daily harvested data					
date					
No	select fish type	quantity	details	status	Action
1	▼			▼	delete
2	▼			▼	delete

**Figure 8: Record module for clerk**

Manage Harvested data							
Search							
back							
No	Date	name	quantity	approve	details	Action	
1	1/6	a	1	sell	all good	edit	delete
2	1/6	b	12	waste	bad	edit	delete

**Figure 9: Record module for supplier**

### 3.3 Build Prototype Phase

The third phase entails creating a prototype. A prototype will be constructed if the client approves of the quick design phase. It's a modest functioning model of the system that's needed. After the prototype is completed, the client will be given the opportunity to inspect and test it before moving on

to the next phase. The prototype of the system is built using PHP, HTML, CSS, while the MAMP and MySQL as the server and database.

### 3.4 User Evaluation Phase

The fourth phase is consumer evaluation. Prototypes are presented to supplier for initial evaluation processing. It helps to know the strengths and weaknesses of the work model. Google Forms are created for supplier to provide evaluations of prototypes and provide feedback and advice.

### 3.5 Refining Prototype Phase

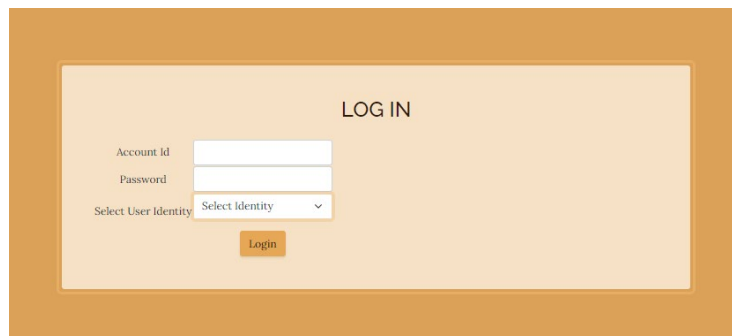
Fifth phase is refining prototype. This phase will be looping when the supplier is not satisfied with the current prototype, so it will go to the fourth phase for look back the user's advice and feedback and make refine. If the user is satisfying to the prototype, then the final system will be developed based on the approved final prototype.

### 3.6 Implement and Maintain Phase

Sixth phase is implemented and maintain. When the final prototype is used as a reference for develop the final system, it is thoroughly tested and deployed to production. The system will do daily maintenance to avoid the large-scale failures and to minimize the downtime.

## 4. Result and Discussion

A web platform was used to build the system. This section presents the results of the system implementing and testing. The HTML, CSS, and PHP programming languages were used to build the system. MAMP and Sublime Text are the software used.



The image shows a web form for logging in. The form is centered on a light orange background. At the top right of the form area, the text 'LOG IN' is displayed. Below this, there are three input fields stacked vertically. The first is labeled 'Account Id', the second 'Password', and the third is a dropdown menu labeled 'Select User Identity'. Below these fields is a single orange button labeled 'Login'.

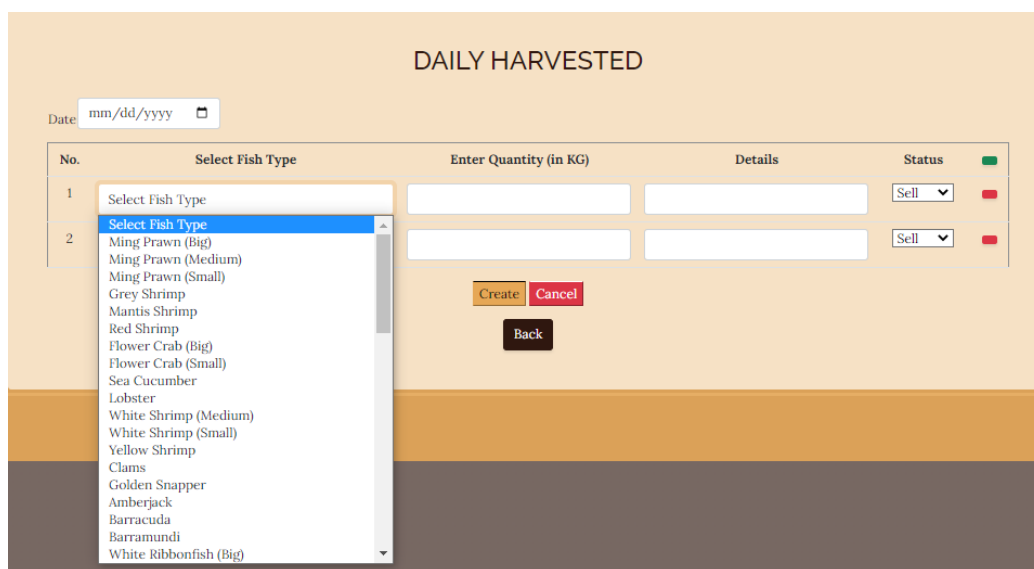
**Figure 10: User Login Interface**

**Figure 10** shows the user interface of account login page. **Table 5** show the test case for Registration and Login module. There are total of 5 test case for this module. The purpose of this test is to verify whether the supplier and clerk is allowed to register for an account, login into the system, and whether the system will show error message if an incorrect credentials is entered.

**Table 5: Test Case for Registration and Login Module**

Test Case ID	Description	Expected Result	Actual	Result
T1-1	To check whether supplier can register for a clerk account	The supplier should be able to create for clerk account	The supplier has successfully created for clerk account	Pass
T1-2	To check whether supplier can register for a trader account	The clerk should be able to create for trader account	The clerk has successfully created for trader account	Pass
T1-3	To check whether all users can login by valid account id and password	The user should be able to login into the system	The user has successfully logged into the system	Pass
T1-4	To check whether error message shown when invalid input	The system should show error message when an incorrect credentials has been entered	The system shows error message on the URL when an incorrect credentials has been entered	Pass
T1-5	To check whether the system will redirect the user to respective main menu once success login	The system should redirect the user to respective main menu after login successful	The user has successfully login to their pages based on their identity	Pass

**Figure 11** depicts the clerk interface of record harvested data. It has a select box on the column Select Fish Type, and at the right-hand side, there are two buttons, green color is for add new row, while the red button is to delete the row. The Record module's test case is shown in **Table 6**. For this module, there are eight test cases. The purpose of this test is to verify whether the clerk is allowed to create for new fish type and harvested data and whether the system allows the supplier to edit, search, or upload the data.



**Figure 11: Record Harvested Data Clerk Interface**

**Table 6: Test Case for Tasks Management Module**

Test Case ID	Description	Expected Result	Actual	Result
T2-1	To check whether the system allow clerk to create type of fish and the prices of each	The clerk should be able to create type of fish and the prices of each	The clerk can create type of fish and the prices of each in the system	Pass
T2-2	To check whether the system allow clerk to create daily harvested data	The clerk should be able to create daily harvested data	The clerk has successfully created daily harvested data	Pass
T2-3	To check whether the system allow the supplier to edit and delete the fish type	The supplier should be able to edit and delete the fish type	The supplier can edit and delete the fish type in the system	Pass
T2-4	To check whether the system allow the supplier to edit and delete fish harvested data	The supplier should be able to edit and delete fish harvested data	The supplier success to edit and delete fish harvested data if wrong occur	Pass
T2-5	To check whether the system allow the supplier to search the data by the keyword.	The supplier should be able to search the data by the keyword	The supplier has successfully to search the data by the keyword using search bar	Pass
T2-6	To check whether the system allow the supplier to print out the daily harvested data as daily report	The supplier should be able to print out the daily harvested data as daily report	The supplier can print out the daily harvested report	Pass
T2-7	To check whether the system should allow the supplier to upload the daily report into the database	The supplier should be able to upload the daily report into the database	The supplier success to upload daily report into database	Pass
T2-8	To check whether the system should alert the supplier once the report is upload success or fail.	The alert will show for the supplier once the report is upload success or fail.	The alert message displays every time when the supplier uploads the report to show the upload status	Pass

```

$duration = 30;
$cleanup = 0;
$start = "12:00";
$end = "18:00";

function timeslots($duration, $cleanup, $start, $end){
    $start = new DateTime($start);
    $end = new DateTime($end);
    $interval = new DateInterval("PT".$duration."M");
    $cleanupInterval = new DateInterval("PT".$cleanup."M");
    $slots = array();
    for($intStart = $start; $intStart < $end; $intStart->add($interval->add($cleanupInterval)){
        $endPeriod = clone $intStart;
        $endPeriod->add($interval);
        if($endPeriod > $end){
            break;
        }
        $slots[] = $intStart->format("H:iA").".".$endPeriod->format("H:iA");
    }
    return $slots;
}
    
```

**Figure 12: SQL for timeslots**

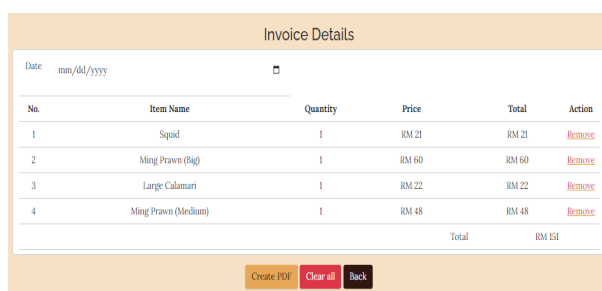
**Figure 13: Upload Assign File Interface**

In **Figure 12**, the source code for generate the timeslot is shown. **Figure 13** shows the upload Assign file interface. The select box shown the option which have 12 timeslots to choose. The clerk will need to choose the date, trader, insert order id, attach the file, and choose the transaction time. Once click “Create” button to add the file into the database. The “Back” button will redirect clerk back to main page.

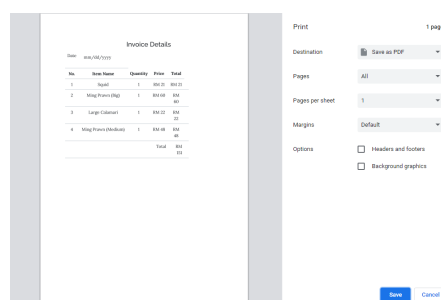
**Table 7** shows the test case for record module. There are total of 5 test case for this module. The purpose of this test is to verify whether the clerk is allowed to message the trader through WhatsApp redirect from the system and whether the trader able to view and cancel the assign order in the system.

**Table 7: Test Case for assign Module**

Test Case ID	Description	Expected Result	Actual	Result
T3-1	To check whether the system allow clerk to message the trader once have fish stock assign to them	The clerk should be able to message the trader once have fish stock assign to them	The clerk has successfully messaged the trader through WhatsApp which redirect from the system	Pass
T3-2	To check whether system allow trader to contact clerk once they have problem	The trader should be able to contact clerk once they have problem	The trader can contact to clerk anytime through the WhatsApp	Pass
T3-3	To check whether the system allow trader to check the assign fish stock list	The trader should be able to check the assign fish stock list	The trader can view the assign fish stock list in the system	Pass
T3-4	To check whether the system allows the trader to cancel the assign file.	The trader should be able to cancel the assign file	The trader success to cancel the assign file	Pass
T3-5	To check whether the system allow the clerk to change the transaction time	The clerk should be able to change the transaction time of assign order	The clerk has successfully to change the transaction time of assign order when the trader asks for	Pass



**Figure 14: Invoice Trader Interface**



**Figure 15: Generate PDF Interface**

**Figure 14** shows the trader interface of invoice page. There is a button named “Create PDF” to create the invoice in PDF. Once clicked, a PDF form will pop out as **Figure 15**. **Table 8** show the test

case for Invoice module. There are total of 7 test case for this module. The purpose of this test is to verify whether the supplier and clerk is allowed to view the invoice and receipt file in the system anytime, and whether the system will allow the trader to generate invoice and upload.

**Table 8: Test Case for Invoice Module**

Test Case ID	Description	Expected Result	Actual	Result
T4-1	To check whether the system allow the trader to generate an invoice about the fish stock that received	The trader should be able to generate invoice for the fish stock	The trader success to generate invoice for the fish stock	Pass
T4-2	To check whether the system allow supplier to delete the error invoice and receipt file	The supplier should be able to delete the error invoice and receipt file	The supplier has successful delete the error invoice and receipt file	Pass
T4-3	To check whether the system allow trader to upload the invoice and receipt file to the system when there is empty in the column	The trader should be able to upload the invoice and receipt file as pdf to the system when there is empty	The trader success to upload the invoice and receipt file in pdf to the system when there is empty in the column	Pass
T4-4	To check whether the system allow supplier to view after the trader upload the invoice and receipt	The supplier should be able to view after the trader upload the invoice and receipt	The supplier can view the invoice and receipt after the trader upload	Pass
T4-5	To check whether the system allow the trader to check the status of the payment whether is state "Successful" or "Pending"	The system should allow the trader to check the status of the payment whether is state "Successful" or "Pending"	The trader success to view the status of the payment whether is state "Successful" or "Pending"	Pass
T4-6	To check whether the system allow the supplier to confirm the payment of invoice and update in the system at the same time	The system should allow the supplier to confirm the payment of invoice and update in the system at the same time	Once the supplier approve the payment of invoice and it will update the status at the same time	Pass
T4-7	To check whether the system allow the supplier and clerk to view the invoice any time	The system should allow the supplier and clerk to view the invoice any time	The supplier and clerk can view the invoice any time since it stores in the database and folder	Pass

**Figure 16** depicts the interface for monthly report. The right-hand side have a button for supplier to click for approve the report. **Table 9** show the test case for Report module. There are total of 3 test case for this module. The purpose of this test is to verify whether the clerk can generate monthly report and upload successful and whether the supplier can approve the report and status changed.

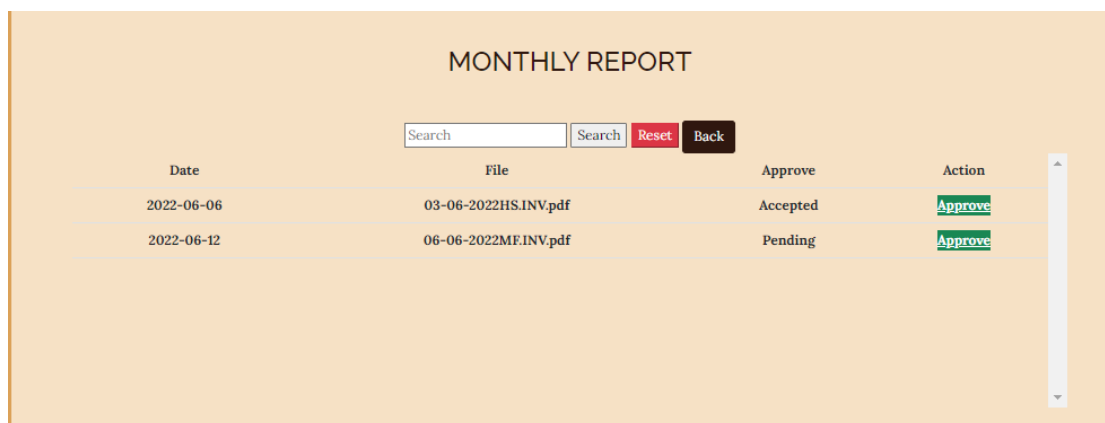


Figure 16: Report Interface

Table 9: Test Case for Report Generation Module

Test Case ID	Description	Expected Result	Actual	Pass/Fail
T5-1	To check whether the system allow the clerk to generate the monthly report and upload	The clerk should be able to create for monthly report and upload	The clerk success to create for monthly report and upload to system	Pass
T5-2	To check whether the system allow to view the transaction record of every trader.	The system should be allowed supplier and clerk to view all the transaction record	The supplier and clerk success to view all the transaction record of trader	Pass
T5-3	To check whether the system allow the use to print the report	The user should be able to print any report or file from the system	The user has successful to print the report and file in the system	Pass

## 5. Conclusion

The system was created using the findings of the system design analysis. It uses MySQL to store the system database and uses MAMP as an open-source server. The system can be connected to third parties, which is WhatsApp easy for users to communicate. The problems that arise in the current approach can be solved by the developed system. It gives the user the benefit that it saves the supplier’s clerk time in producing monthly reports and stores the reports, invoices, and receipts in the system in PDF format to avoid loss and can be viewed at any time. Future system upgrades for the monthly report production process are possible. Also, the system can include a feature that alerts users to re-login the system when a fresh assign list or updated payment status is available. The transaction time can be made faster by hiding the time that another user has chosen to reduce fishing congestion.

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