

## MARITIME SHIPMENT MOBILE APPLICATION

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**Abstract:** The growth of e-commerce has affected the world drastically and increased the number of users for e-commerce. Therefore, the seller or buyer will need an online platform to manage their shipping activities to facilitate shipping costs. Shipping costs include the payment of cargo, freight, and tax insurance to the government. In this study, a mobile application was designed and developed to book vessels and identify and pay the amount of money that needs to be paid, particularly on the rate of the cargo and tax insurance premium. For this project, the methodology chosen is the Agile methodology. Agile development makes conscious of the problem earlier than becoming interested in the issue once the plan is finished. The agile methodology includes the user constantly throughout the entire project, including revision scheduling, test sessions and new features incorporated into the code. This system is developed using the three-tiered architecture. The architecture of three levels connects the presentation layer, application layer and database layer. The reason this architecture is chosen is that it will have high performance. The importance of high-performance architecture is that this application consists of a booking element that must be applied for payment. This project has developed a secure and user-friendly mobile application for maritime shipments. This mobile maritime shipping application can book vessels, apply for insurance and cargo tax, and make the shipment payment most easily and securely. In addition, this system can create documents relating to the shipment. By using this mobile application, payments will be made online and eliminate paperwork.

Keywords: Maritime shipment, Agile, Book vessel, Cargo Insurance, Tax and Payment.

### Introduction

Maritime law, commonly known as admiralty law, is a body of laws and agreements. Also, the maritime law covers the development of legislation, customs and excise regulations, employment issues and all the maritime activity nationally and internationally. Besides that, maritime law also covers the issues related to insurance claims, such as property damage, personal injuries, wreck and salvage, piracy, container, and passenger liner matters. Insurance that covers the cargo varies on the type of the commodity. The rate of taxes will be varied by country and type of cargo. Not only that, the vessel will be booked for shipment. With online shopping now accounting for almost 10% of total retail sales, e-commerce significantly

impacts traditional retailing and will continue in the following years (“E-commerce 2019: Online shopping trends and statistics”, 2019). The growth of e-commerce has affected the world drastically and increased the number of players. Therefore, it requires a platform for the seller or buyer to manage their shipping activities to facilitate the cost of business. The existing applications only act as a calculator, but none of them has stored those users’ data and all the systems are web-based. Not only is the user facing difficulties in making payments, but the users also face the problem of referring to or updating any data.

Marine insurance is a contract or policy to indemnify marine losses that happen during marine adventure when the subject matter of

insurance, such as ships, cargo and vessels, are exposed to maritime perils (Marine insurance act, 1906, n.d.). Roanoke Trade is a cargo insurance company. They provide an online cargo insurance calculator on their official website. However, the contents of that page are for demonstration purposes only, and activity on the page does not constitute the issuance of insurance.

Every good that enters and exits Malaysia is subject to tax. Therefore, the tax could be part and partial of the shipment cost (“TAX TREATMENT OF MALAYSIAN SHIP”, 2012). Cargo Wizard is a web page of the SeaRates website. The website is available on the web and IOS platform, but the Cargo Wizard is unavailable in the mobile app. It is a paid website which costs RM1257.90 per year for Cargo Wizard.

The freight rate is calculated based on the value and type of cargo. The forwarding provider offers to individual shippers, companies, and other entities in consideration of freight payment (“Freight & Cargo Shipping Services | UPS -

Malaysia”, 2019). Freight Cover is one of the premium calculators for cargo insurance under A&B Insurance Brokers. It is a free calculator to calculate insurance. This website also provides services like claim insurance.

## Materials and Methods

The methodology that has been chosen for this project is the Agile methodology. The main reason for choosing the agile method is to prevent known problems from occurring. In addition, agile development is an improvement in project planning usually used in software development. This helps teams adapt to the complexity of building software by gradual, iterative project cycles, known as sprints.

Figure 1 shows the illustration for Agile Methodology. The agile software development approach often begins by identifying users and documenting a strategic plan on the range of issues, challenges and principles that need to be solved. Then, the Development Team captures this vision and partners with a multidisciplinary team to deliver this vision.

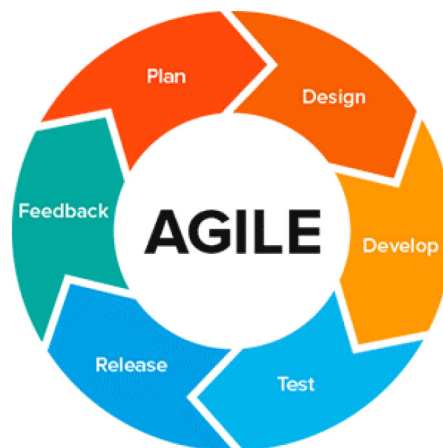


Figure 1: Agile Methodology

Agile development can be aware of the problem earlier than get interested in the problem once the plan has been finished. Similarly, agile makes it possible for us to learn about future problems and to be able to respond in advance. This makes it easy for the project developer to adjust the schedule according to the current situation without any complications.

The agile methodology constantly includes the user throughout the entire project, including revision scheduling, testing sessions and new features incorporated into the code. Therefore, clients can realize the research is in motion, not the finished result, during the openness of the campaign. Using this agile approach, this project could finish as soon as possible. Therefore, the agile method will be the best method for the Maritime Shipment mobile application.

### ***System Requirements***

#### ***Functional Requirements***

Functional requirements are gathered from a user by interview to describe the behaviour of the system. The following functional requirement is gathered to develop the maritime shipping mobile apps:

- i. The system shall provide Employee with the ability to make a booking vessel.**
  - a. Employee view and select available countries involve in shipment.
  - b. Employee provides the weight of the cargo.
  - c. Admin will manage the availability of vessels for the shipment.
- ii. The system shall provide Employee with the ability to calculate tax for cargo.**
  - a. Employee select the countries and provide cargo details.
  - b. Employee completes CBP form and submits.
  - c. Custom manages tax rate for cargo.

- iii. The system shall provide Employee with the ability to apply for cargo insurance.**

- a. Employee complete the cargo information for cargo insurance.
- b. Employee complete the insurance form
- c. Insurance agent manages the premium of cargo insurance.
- d. Insurance agent approves the cargo insurance form.

- iv. The system shall provide Employee with the ability to make payments.**

- a. The system shall make payments to customs and insurance agents.

- v. The system shall provide Employee with the ability to collect the shipment document.**

- a. The system creates a bill of lading after successful payment.
- b. The system will provide the approved CBP form and Insurance certificate.

#### ***Non-Functional Requirement***

The non-functional requirement defines the quality of this system. This defines how the mechanism operates and is a restriction on the actions of the system. The following are the non-functional requirement of maritime shipping mobile apps:

- i. Security Requirement**

- a. The vessel availability in this system only can manipulate by the admin.
- b. The transaction that is made from this system is secured.

- ii. Operational Requirement**

- a. The system will operate in Android environment.
- b. The system will be able to run with an internet connection.

**iii. Usability Requirement**

- a. An employee should be able to use the system without any training.

**iv. Performance Requirement**

- a. The system should be able to respond does not exceed more than a minimum of 2 seconds for every instruction.
- b. The system should be available 24/7.

**Results and Discussion**

**Use Case Diagram**

Use a case example to explain, in a straightforward way, the core features of the device and the different types of users that communicate with it. Figure 2 shows the use case diagram of the Maritime Shipping mobile app.

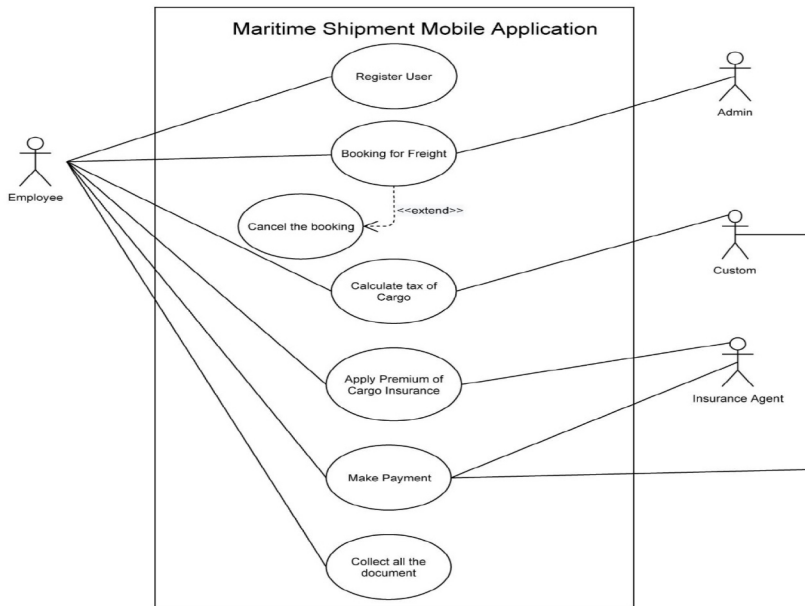


Figure 2: Use case diagram for Maritime Shipping Mobile Apps

**System Hierarchical Menu**

Figure 3 shows the hierarchical menu of the Maritime Shipping Mobile Application. The

users can enter the system and find the modules that appear above. Furthermore, it enables users to enter any of the modules easily.

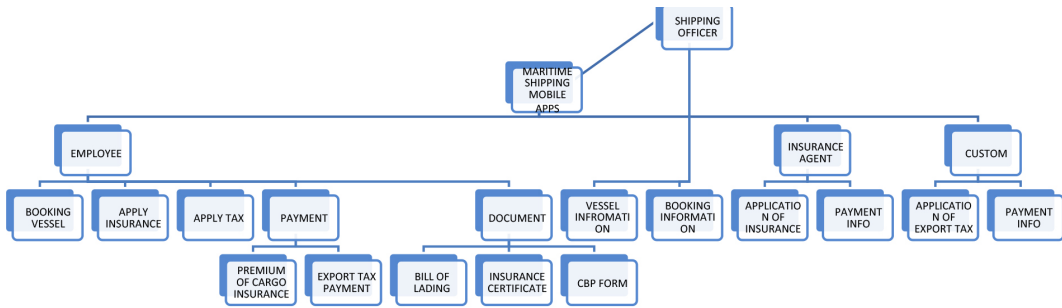


Figure 3: Hierarchical Menu of Maritime Shipping Mobile Application

**System Development**

**Home page of Employee**

Figure 4 is the first page for employee module. The employee can choose any of the buttons to

start the operation. The Employee Home page will appear after the employee log into their account using their username and password.

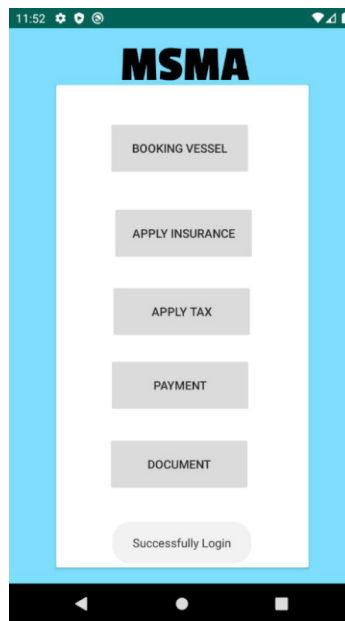


Figure 4: Home Page

**Booking Vessel**

In figure 5, the employee can book the vessel by filling up the Origin of shipment, destination shipment, date of loading, cargo weight and type

of shipment. After Clicking the Book button, the system can create a Bill of Lading for the shipment in pdf. format. Then the data of the shipment will be forwarded to the Shipping officer.



Figure 5: Booking vessel

### *Apply Insurance*

Figure 6 shows Apply Insurance interface. Employee need to provide the customer’s details and the detail of cargo. The cargo details are Coverage Desired, Type of Shipment, Origin and

destination of Shipment, and Insuring Terms. This interface helps to create an insurance policy for the cargo. Those insurance details will be forwarded to the insurance agent to verify the cargo details and the insurance agent will provide the Premium of cargo Insurance.

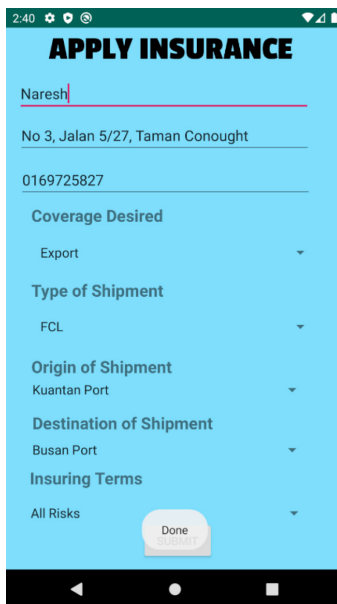


Figure 6: Apply Insurance

### ***Apply Tax***

Figure 7 Apply Tax is the interface where employees can apply for tax calculations. The employee needs to enter the details of the customer and the details of the cargo. Employee should enter the name of customer, Cargo Tax

ID, Address, Date of Shipment, Mobile Number, Type of Shipment, Origin and Destination of Shipment, Type of cargo, the quantity of cargo and weight of cargo. Then, those data will be sent to the Custom officer to calculate the cargo tax and create a CBP form.

Figure 7: Apply Tax

### ***Payment***

In this Figure 8, the Payment employee can choose the button to make a payment. The insurance agent and Custom Officer will

provide the payment details. After the payment is completed, all the documents will be available at Document Interface.

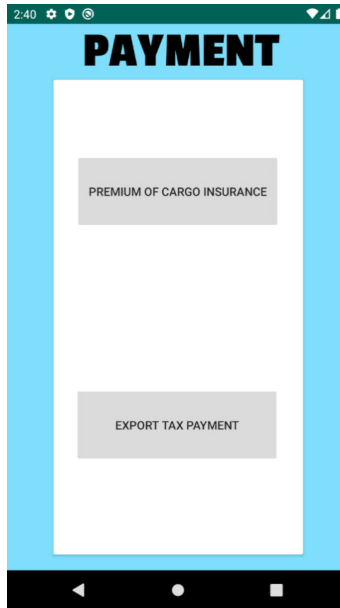


Figure 8: Payment

**Document**

Employee can choose those buttons in Figure 9 Document to download the documents. All

the documents will be in pdf. format. Those documents only will be available after making the payments.



Figure 9: Document



### ***Book Available Vessel***

Figure 10 shows the interface of the Shipping Officer to book available vessels. Once the

Shipping Officer gets a notification, they can check for the available vessel for shipment and book the vessel according to its availability.

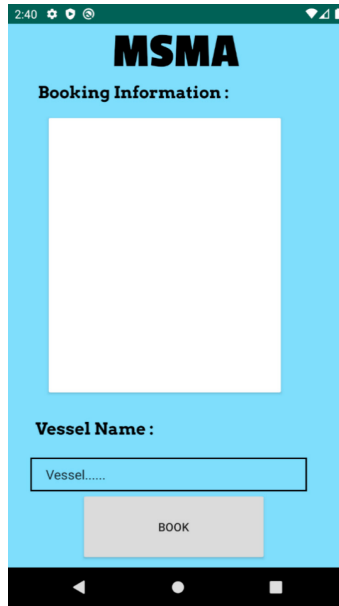


Figure 10: Book Available Vessel

### ***Application of Insurance***

Figure 11 shows the interface of the Insurance Agent. The insurance agent can check the application once they get the notification. Then

Insurance agent will calculate the Premium for the cargo insurance. Later they will approve the insurance application by stating the cargo insurance premium.

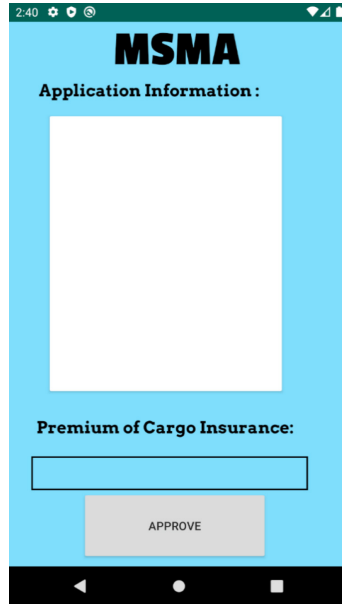


Figure 11: Application of insurance

***Application of Export Tax***

Figure 12 shows the interface of Custom Officer. The Custom officer can check the application once they get the notification. Then Customer

Officer will calculate the tax rate for the cargo. Later they will approve the tax application by stating the tax rate for the cargo.

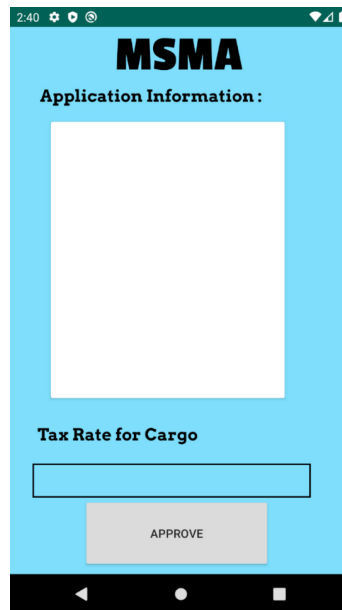


Figure 12: Application of export tax

### System Contribution

Maritime Shipment mobile application has contributed to various aspects. First, this system helps the employee and shipping officer manage the booking of vessel for the shipment. They can manage their date of shipping and the details of vessels. Not only that, this system helps the employee to make applications and payments for the shipment.

### Conclusion

To conclude, this Maritime Shipment mobile application mainly focuses on booking vessels and applying for tax and insurance. For the booking vessel module, in this system, the employee can book a vessel for shipping of cargo by complete form and give the details about the shipping details. Employees can also apply for insurance for the cargo shipped out in the vessel. Also, employees can apply tax for the cargo that is exported to other countries. This system will make the work easier to store shipment data. In addition, the shipping document is created by the system, and employee can download it. The shipment cost, including the payment of insurance for cargo and tax can be made through this system. Therefore, the apps will cater to all these matters.

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