

The Design of Vehicle Laying Model in Ticket Booking Application Ship

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Abstract: In today's modernization era, almost everyone needs something that is practical and easy. Therefore, almost all aspects of human activity today are set by using an automated system, include transportation needs. The system of information on transportation facilities have been widely applied in Indonesia. However, the information systems that applied in marine transportation facilities are rarely found. The Ecommerce System answers everyone's need to do something practical and easy. Therefore, the authors designed an application ticket booking system that is devoted to ferry crossing by bringing the vehicle. The method used is Agile Development Methods. This application will provide convenience for buyers to conduct transactions and the provision of vehicle space.

Key words: E-commerce, e-ticket, agile development methods.

1. Introduction

In today's modernization era, almost everyone needs something that is practical and easy, for almost all aspects of human activity is currently organized using an automated system, including transportation needs where it has become a premiere requirement for everyone, whether sea transportation, air and land [1]. However, the information systems applied to current transportation facilities are rarely found in marine transportation facilities that should be accessible via web and mobile devices, either from the scheduled departures, information or ticketing process.

The ticket booking system for boats with vehicles is quite a concern because it is still not running well. Crossings are still done with the manual system that resulted in frequent occurrence of accumulation of vehicles in the port that makes the state of the port looks irregular. Sometimes also vehicles that enter into the hull of the ship has not been optimal because there is no system that provides space for the availability of vehicles in the hull so that the entry of vehicles in the hull can be optimally well and regularly so that there is no buildup in the port.

E-commerce systems have changed business activities with traditional systems or manuals via internet. E-commerce answers everyone's need to do something practical and easy. The E-commerce system can be viewed as a client-server system [2].

B2C is the type of E-commerce between the company and the end consumer [3]. This type can be more easy and dynamic and consumers are usually easy to get information, but also can spread unevenly or even be stopped. Business to Consumers (B2C) is a type of business that is done between a business person and a consumer, such as between a manufacturer who sells and offers his products to the general consumer

online [4].

2. Theoretical Basis

Port of Ulee Lheue, although including a large port, the ordering process is still fairly manual. Storage of data that is still manual, and manual process that takes a long time. Especially for a special ship carrying a vehicle. The process is only done at the harbor counter, thus making the Harbor filled with the visitors who want to make ticket reservations, there is disorder in the process, the buildup of vehicles that want to be taken to cross to Sabang Island. The disappointing thing also happens when the situation where we have been queuing for a long time we can't go across because the ship is full and can't be filled again. We have to wait until the next turn. Quite a lot of time during the crossing process at Ulee Lheue Port.

In the year 2017 end of May, from the Maritime Fast Ship Express, launches an E-ticket system for ordering process at Ulee Lheue Port. The e-ticket system offers reservations via text messages or WA messages. Here's how the E-ticket system works:

- 1) Reservations are made via text message or WA message.
- 2) The booked passenger sends the date of departure and the list of names of prospective passengers.
- 3) Then passenger get reply in the form of booking code from order number.
- 4) Do a check in and payment directly at the counter by showing the booking code and show passenger ID card, maximum 30 minutes before departure.

It is clear that in the Port of Ulee Lheue there is no special crossing system for slow boat carrying vehicles. The buildup of vehicles occurring at the port will still be clearly visible at the port. The system is still irregular need to be a concern for the future for the system in the Port of Ulee Lheue everything is running automatically.

Here're some previous research on online ordering system.

Table 1. Previous Research

No	Topic	Author	Result
1	Adoption Factors of Online-Web Railway Ticket Reservation Service (Case from Indonesia)	Indrawati, SofiarYusliansyah (2017)	Ticketing system based on Unified Theory of Acceptance and Use of Technology (UTAUT) 2 Model [5].
2	Analysis of Dishonorable Behavior on Railway Online Ticketing System Based on k-Means and FP-Growth	L. Yang, F. Wang and T. Wang (2017)	In order to improve booking tickets experience of the users of Railway Online Ticketing System and ensure the system normally running [6].
3	Formal Object-Oriented Analysis and Design of an Online Ticketing System	Xiaoshan Li, Zhensheng Guo (2001)	This paper presents a formal use of the Unified Modeling Language (UML) to analyze and design e-commerce systems by using an online ticketing system as a case study.
4	The design of online ticket booking application ship based on android	Deybi W. E. Sede, Alicia A. E. Sinsuw, Xaverius B. N. Najoan (2015)	Application of online ticket booking ship based on android using methodology DAD (Disciplined Agile Delivery) [7].

3. Methodology

Agile Development Methods

Agile Development Methods is a short-term development system that requires rapid adaptation of developers to changes in any form. One model of agile development methods is Dynamic Systems Development Methods (DSDM) [8].

The Dynamic System Development Method provides a framework for building and maintaining the system for a limited time through the use of incremental prototypes in a conditioned environment. Things to note when using the dynamic system development method:

- 1) Feasibility study, prepare the requirements, and limitations, then test whether appropriate use DSDM process.
- 2) Business Study, stacking functional and information needs, specify the application architecture and identification of maintenance requirements for the application.
- 3) Functional model iteration, show the software function to the client for feedback.
- 4) Design and Build Iteration, double check the built-in prototype and make sure that the prototype is built in a way that enables the functionality to actually work.

4. Analysis and System Design

In accordance with the methodology used is the methodology of Agile Development Methods with Dynamic Systems Development Methods (DSDM) model, the following steps will be taken to design the prototype of Ulee Lheue Port crossing ticket booking.

4.1. Feasibility Study

This phase helps to provide feasibility in building the system to be designed. This phase describes the requirements of the system to be designed and the goals to be achieved in the future with the development that will be done.

The design of the ticket booking system is here for Ulee Lheue Port, Banda Aceh. Booking a ferry ticket for a ferry boat carrying a vehicle. Port Ulee Lheue though including a large port, the ordering process is still fairly manual with a long process. Visitors who want to bring a vehicle, have to queue up from the entrance of the ship, resulting in accumulation. To that end, the system designed will be added with the availability of space remaining vehicles, so that all visitors do not have to queue at the port, enough who have registered the vehicle that is queuing at the entrance of the ship. For subsequent development can be used throughout the system ferry ship slow ferry nationally and abroad.

4.2. Business Study

This phase helps to analyze the character of business and technology in building the system to be designed. B2C Business to Consumer is an e-commerce business that I will design for ticket booking model of UleeLheue Port. With e-commerce system will help the process of booking ticket crossings to be more practical and easy, and then minimize the accumulation of passengers who are in the Port. This is the use case of the system that want to design.

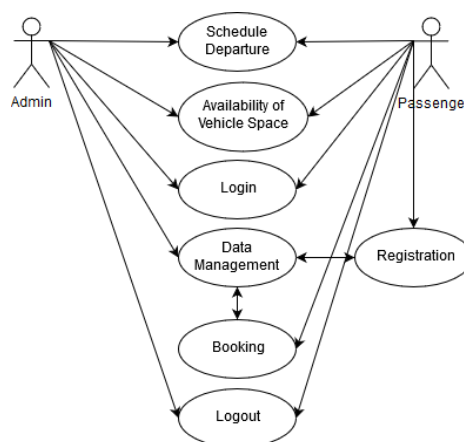


Fig. 1. Use case diagram booking ticket.

Here table of scenario from use case.

Table 2. Scenario Use Case

No	Topic	Result
1	Admin	<i>Check Departure Schedule</i> Can see details of departure schedules listed in the system
		<i>Check Availability of Vehicle Space</i> Can see the rest of the vehicle space that will be brought to cross
		<i>Login</i> By inputting a username and password that has been registered before
		<i>Data Management</i> Can process data both personal data and data from passengers who have done registration
		<i>Booking</i> Processing orders made by passengers who order until the payment process
		<i>Logout</i> Admin out of system
		<i>Check Departure Schedule</i> Can see details of departure schedules listed in the system
		<i>Check Availability of Vehicle Space</i> Can see the rest of the vehicle space that will be brought to cross
		<i>Login</i> By inputting a username and password that has been registered before
		<i>Data Management</i> Admin can process data
2	Penumpang	<i>Booking</i> Ordering until payment, can also cancel booking
		<i>Logout</i> Admin out of system

Here sequence diagram from booking ticket system formport of UleeLheuetoport of Balohan, Sabang.

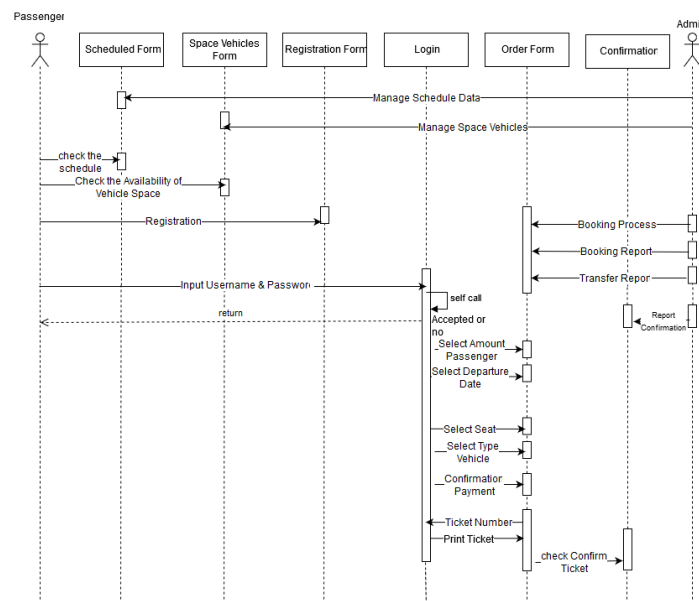


Fig. 2. Sequence diagram of booking ticket.

4.3. Functional Model Iteration

This phase helps to provide the information processing gained in business research. Port of UleeLheue provides 1 fast boat, the Bahari Express and 2 slow boats that can carry vehicle units, namely the large Ro Ro Ferry boat (KMP BRR Ship) and small (KMP TanjungBurang Ship). For large slow boats can carry 377 people with 81 units of combination vehicles, while for small slow boats can carry 325 people with 22 units of combination vehicles.

For transporting a vehicle, a transporting vessel has a requirement in terms of weight, for which any crossing vehicle has a load criterion that may be taken on board a ferry. The Ro Ro Ferry boat is capable of transporting vehicles with a total weight of 3.5 tons - 40 tons.

In addition to heavy, vehicle laying should also be considered so that vehicle placement can be managed effectively and efficiently. Vehicles should be placed long or long in the direction of the bow or stern of the vessel, should not be transverse. The distance between one side between the vehicles at least 60 cm, the distance between the face and rear respectively 30 cm, and the vehicle adjacent to the ship's wall is 60 cm.

The layout should also be prepared because the vehicles that follow to cross are vehicles-vehicles that vary, such as motorcycles, MPV vehicles, small and medium sedans, buses from small to large, and large trucks.

In the design of this system, the main module is the process of purchasing tickets and the availability of space to be displayed. The following table of functional model review record system to be designed.

Table 3. Model Review Record System

No	Function Name	Feedback
1	Login	Login successful, entering the system according to permissions. Login failed, display error message.
2	Make a booking	Make reservations as per the desired schedule. Cancel order, will delete all reservation data.
3	View availability space	Space available, look at the total load of the vehicle to be brought to cross. If the weight is still below the maximum load limit, continue booking otherwise, the vehicle is not allowed to follow to cross. Space is not available, ordering without a vehicle.

4.4. Design and Build Iteration

This phase helps to refine the prototype to be designed. Build plans of functions that will be available on the system.

The ferry ticket booking system is designed with the addition of better functionality from existing ticket booking systems. Designing the function of space availability for vehicles to be brought to cross and vehicle layout that will be dynamic so passengers can see the available space available for the vehicle (so passengers know whether the type of vehicle he was carrying can still enter the load or not).

The vehicle layout to be designed is the stages that have been determined by the system after the ticket buyer made a ticket booking to cross. Stage that corresponds to the size of the vehicle they registered to come across.

Here the design of the vehicle layout to be marked from the largest vehicle that is large truck with the size of 9mx3m, with the division of several possible parts are:

- 1) Large truck / large bus (9mx3m), will be placed at the front right of the exit from the ship,
- 2) Large truck / large bus (9mx3m) = MPV (4.8mx1,5m); small sedan (2.9mx1.5m); motorcycle (2mx0,9m) @ 3,
- 3) Large truck / large bus (9mx3m) = small bus / large sedan (6mx2,4m); big motor (2.5mx 1.05m) @ 2,
- 4) Large truck / large bus (9mx3m) = medium sedan (3.8mx1,4m) @ 2; motorcycle (2mx0,9m) @ 3,
- 5) Large truck / large bus (9mx3m) = minibus (5mx1,5m); large motor (2.5mx1,05m); motorcycle (2mx0,9m) @ 2,
- 6) Large truck / large bus (9mx3m) = large motor (2.5mx1,05m) @ 4,
- 7) Large truck / large bus (9mx3m) = motorcycle (2mx0,9m) @ 6.

The scenario design that will run from the ticket booking process with this system is as follows:

- 1) Ticket purchasers make online ticket reservations.

- 2) The ticket buyer sees whether the vehicle space is still available for the vehicle he will be carrying across or is no longer available. Available space consists of several stages that have been adapted to several vehicles following some of the above possibilities. If the buyer has chosen the space for the vehicle to be taken and the system accepts the buyer's choice correctly, the buyer will be forwarded in the order by obtaining the code book and the stage code for the vehicle is placed and gets the order number in the queue at the port, clashing with other buyers too. If the buyer's request for choosing a stage is not accepted, the system will provide suggestions for which stage can be chosen in the laying of the vehicle, if the space is not available anymore, the buyer can't continue the order unless he chooses the reservation without the vehicle or must follow in the next hour.
- 3) After the process is complete the buyer finally gets a ticket crossing with some of the files he received.

5. Conclusion

From the design results using the Dynamic Systems Development Methods (DSDM) model in designing the ferry system application by bringing the vehicle there are several advantages with the detailed ideas, the order is no longer done manually with faster process, hull available as space vehicles can be optimized better, passengers are not disappointed because immediately see the availability of space vehicles without having to participate in the queue at the port, there is no accumulation of vehicles in the port because the only queue of vehicles that have finished making reservations. From the other side there are obstacles that arise that is not of course big hull, so in calculation of location of vehicle space rather difficult to be described. For the next development is expected this application can be developed better again by using a more optimum algorithm in the process of placing the vehicle space to be used not only in the national but crossing abroad.

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