Mobile Application Buying Ticket For LRT

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Abstract. Nowadays, transportation is one services handling transportation for people to move from one place to another such as the Light Rail Transit (LRT) in Kuala Lumpur. Many user LRT still using the machine to buy tickets where users need to queue to buy tickets at peak times such as the time to go to work, weekends, school and so on. In addition, users do not have enough money to pay the ticket or the money is too big when users want to pay the ticket in the machine and the user needs to use another machine if the machine breaks down. This method has several disadvantages which can be solved using purchasing a ticket for LRT system using mobile applications where the goal of this project is to develop a system to purchase tickets using mobile applications easier and help users move faster without queuing too long. The objective of this project is to study and analyse the requirements for mobile application buying ticket and also to produce the detailed design and build a mobile application that can helps user purchasing ticket would be easier without the need to queue to buy tickets. With this system, users do not need to go to ticket machine anymore because it can be accessed at anytime and anywhere using a mobile phone. In the development of this project, a prototype methodology has been used along this system development. The system was developed using Javascript programming language with the Model-View-Controller (MVC) architecture pattern to be implemented in the system. Testing is done regularly and repeatedly on the system to accept the probability the result of the user input. The method used in testing is acceptance testing and system testing are combine and performed simultaneously in the activity of black box testing. The result is discussed in this report.
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Keywords: Light Rail Transit (LRT), Mobile Application Buying Ticket For LRT, All Ticket, My Ticket

1   Introduction

Mobile ticket purchase application for LRT is an application that can help people who live in urban areas can move easily without the need to queue to buy a ticket. The mobile application allows users to purchase ticket directly from a smartphone. The objective of this project is to analyse, validate and manage the requirements for mobile applica**tion buying ticket. İt also t o implement the system based on the requirements and design for application** buying ticket and the website where the admin can manage the data update. With this project, it's also to perform testing throughout the software development lifecycle of mobile application buying ticket for LRT. The scope of this project is this system will focus on the public user that used the LRT as their daily public transport to work, to college, home or anywhere and the system allows users to access the system to pay a ticket users easily through applications if there is internet connection.

2   Problem Background

Light Rail Transit (LRT) is a public transport that allows users to move from one destination to another. With the LRT it's can help facilitate the users, but with the system of purchase ticket vending machine at the LRT, it made difficult for users when arriving during peak hours such as the time to go to work, weekends, school and so on. Problems faced by users somehow affected their journey. The main problem that often occurs when users need to queue when buying tickets. In addition, sometimes the vending machines are broken and the user will have to wait longer because to fix the vending machines needs require a relatively long time to fix. With the broken on the machine, the maintenance of the station LRT would need a lot of cost to repair the machine. Furthermore, many

people nowadays are preferring to use public transport than their car or motorcycle because it can save time. Due to technical glitch can also cause users to arrive late to the destination they want to go.

Besides that, users forget to bring their card or the card is lost. It also gives them a problem when the user has arrived at the LRT. In addition, when the user wants to make a payment on the vending machines, users sometimes do not have enough money to pay the ticket. So, they need to find a nearby ATM machine to withdraw money (if any). This is also a problem that must be faced by the users because they need time to find an ATM machine. In addition, users need to make the exchange of money when the money that they have are too big. To obtain a small amount of money that they might have to buy something in a nearby shop (if any). This problem can also affect their journey to reach the destination. Because of this, users need to spend time, effort and money to buy a ticket at ticket machines.

3   Methodology

Methodology is the methods used to provide guidance and direction of the right during the system development process. After being reviewing and making comparisons between methods, the methodology of the prototype model is are appropriate for the control system development life cycle. Prototype model allows the development of application systems in stages which involve four important phases.

3.1   System Analysis Phase

In this phase, the main purpose of this analysis phase is to ensure that the system developed is truly meet consumer needs and to solve the problem(Bennett, S., McRobb, S., and Farmer, R., 2013).

There are steps that have been taken in the analysis phase are:

i.   Identify problems faced by consumers who want to buy a ticket lrt to the desired destination.
ii.   Collecting information related to the system that will be developed through books and web pages.
iii.   Review of the online ticket purchasing system and also in the application of existing phone and identify its shortcomings

3.2   System Design Phase

This phase involves the design of the modules involved, interface design and database design. In addition, the system architecture design process and needs input and output system has also been determined.(Jacobson, S.,2011) To develop this system, the interface design is done in this phase in which the design of this interface will be created using the emulator that has the function as a real mobile phone. While use case diagram is used to represent all the functions of contained in the system from the point of view of users of the system who want to buy a ticket using the system and the administrator of the system. For the sequence diagram shows the interactions between objects from the point of view of time.

3.2.1 Use Case Diagram

This use case diagram consists of actors to represent the users involved with the system and use case represents the operations carried out by the user in the system. Figure 1 show the main use case diagram for Mobile Application Buying Ticket For LRT and figure 2 show the use case diagram for Mobile Application Buying Ticket For LRT of user.
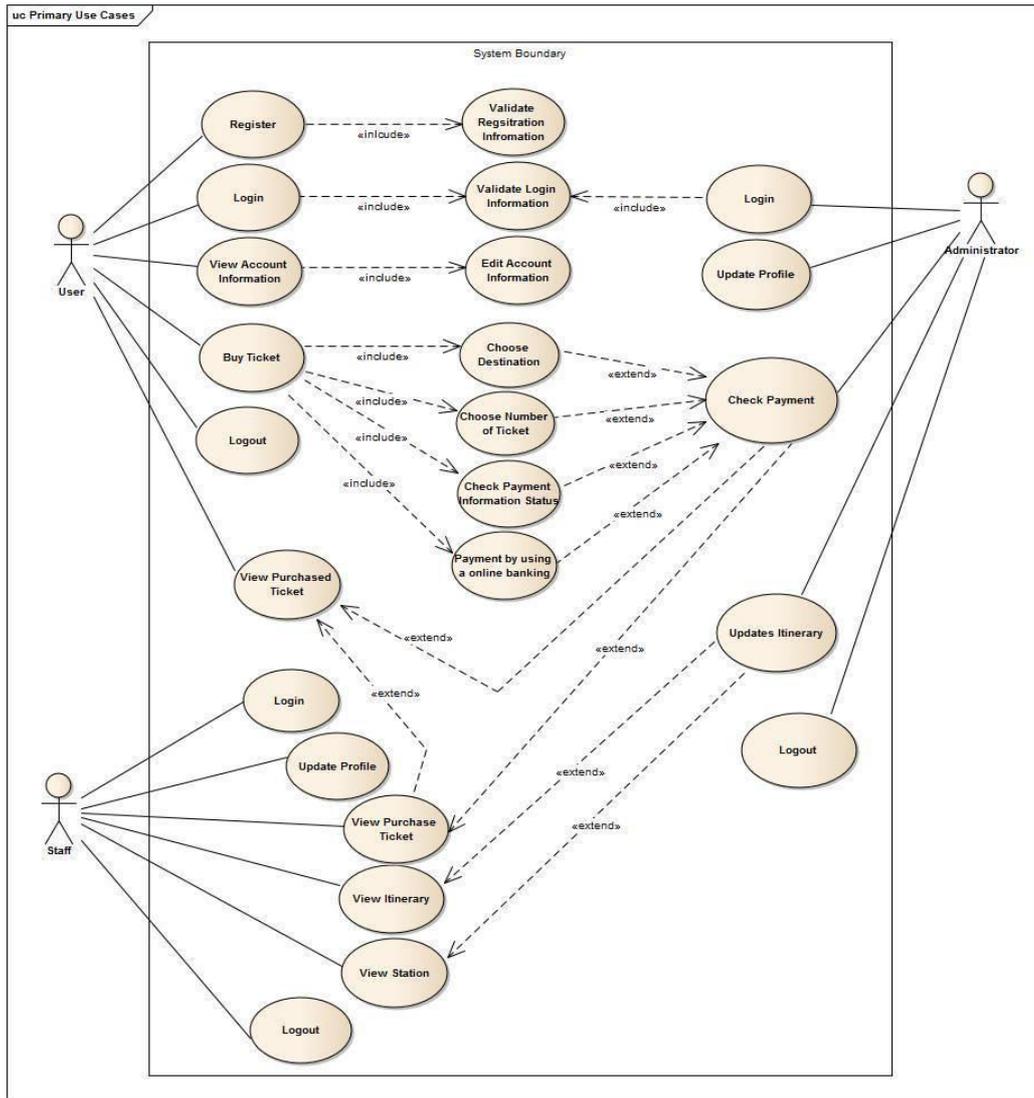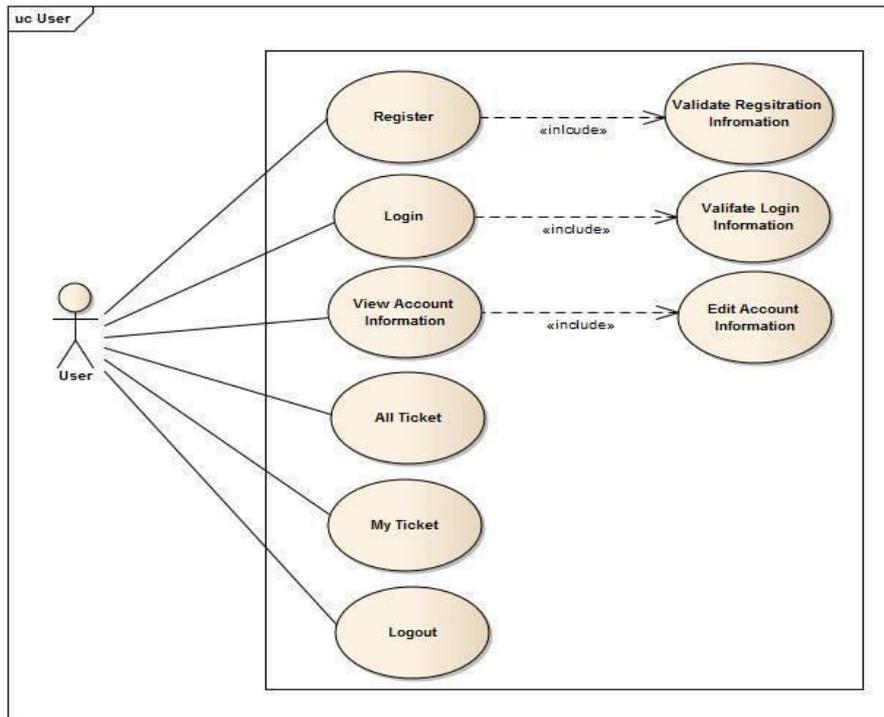
Figure 1 : Main use case diagram

Figure 2 : Use case diagram

Table 1 : List and description of the use case of User

Use Case	Description
Register	This use case allowed user to register a new account before being allowed to access the system. In this use case user need to fill the form with some information such as userID, password, name, contact number, address and so on.
Validate Registration Information	This use case to validate the information which user enters in the registration page is correct or not.
Login	After successful registration, the user is allowed to access the system login. The login system need enter the correct ID and password.
Validate Login Information	This use case to validate the ID and password which user enters in the login page is correct or not. If the ID or password is invalid, the system will warn user enters again.
View Account Information	This use case is used for user to view their information filled in the register.
All Ticket	This use case is used for user to view the ticket that having paid
My Ticket	This use case is used for users to buy a ticket LRT to choose a location that will boarded, destination, date, price and type of payment.

Logout	This use case uses to exit the system.

3.3   System Development Phase

This phase started application development for technical and program code development system. This phase involves program coding, testing, error checking and documenting programs that have been summarized. Documentation of the program is important to facilitate the understanding and future reference.For the database, it is used in a DBMS (Database Management System) which is used is the NGIX Server to store data associated with this system.(Sommerville, I.,2011) Coding part of the website for reference purposes of users and the administrator management, system development using Javascript and will be integrated with the database.

3.4   System Implementation Phase

In this phase, the implementation phase is described as those activities that begin when the system design has been completed. Testing of the system was installed to ensure that the system developed to meet the specifications set during the analysis phase and design phase. The system has been developed to be installed for users. Test methods used to test this system is a black box testing.

4   Results

Interface system a platform for users to interact with the system to ensure that the developed system can be used according to the requirements set. Interface design should be designed and developed in detail ensure that there user-friendly, meet the specifications and attractive. The table shows the strength and weakness for each of the existing system

Table 2.1: Comparison between existing system and application to be developed.

	Strength	Weakness
MARA Liner Ticket System	Interface design simple and user friendly. Have manage time schedule and transportation services. Users need to print a boarding pass containing six unique code generated by the computer along with travel information.	The system is too complex for user. User needs to print a boarding pass before boarding.
Malaysia Train Map for LRT & Train Application	Simple and user friendly interface design. Using the filter function to browse the train station. This application only suitable for travelers and tourists.	The system is relatively less attractive for consumers to use. User cannot zoom in or out of the maps
RapidKL Travel Guide Application	User can access easily and quickly to the frequency of services, hours operation. Have the rail service status such as "service is normal". Suitable for journey planner. Have the routers to know destination.	The user interface is terrible scrolling on the map can be read as gestures to switch. Route planner tab is not available and it is very difficult to consumers. The information notice damage or delay of this trip is very slow

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| Buying Ticket for LRT Application (mine) | The application helps users choose any way the fastest route or the cheapest route for each trip. Allows users to buy and display tickets and passes from smartphones available Simple user interface Tickets do not expire until activated | If user activated the ticket it cannot be returned. Only available on android OS. |

In this system, the interface design can be divided into two main sub-screens in mobile applications and web site. The figure shows the interface of the system which the process of user to purchase the ticket.

Figure 3 : Buy Ticket Page

Figure 4 : All Tickets Page

5   Discussion

Mobile Application Buying Ticket For LRT is a system that allows users to buy tickets with the more formalized, convenient and safe where it can be accessed at anytime and anywhere. This application involves three main actors which are customer who are mostly used LRT, admin and staff.

Basically, this application is begun with customer need to login the system. Then customer need to select the departure station, destination station and number of ticket before they paid the ticket. After paid the ticket, customer can view the details of tickets where customer can know the status of ticket which paid, unpaid, used and expired. **İf the status of ticket is paid, customer can scan the QR Code at the counter to get the ticket. On the other** hand, this system also used by staff and administrators to be used for administrative work.

To ensure the system runs smoothly and effectively, software testing has been done on this system. This application do the testing using with black box testing. Acceptance testing and system testing are combine and performed simultaneously in the activity of black box testing.

6   Conclusion

This application is developed to achive the entire objectives that have been discussed in chapter one. **İts development** began with the research of the problem statement, aim, objectives and scope of the system. Next, research the background of existing systems and even systems related to the system to be developed and the technology related to the development of this system was conducted. All the strength and weakness were studied and analyses. After the completion of a research on the requirement of the system such as hardware, software and so on, the initial design process of the system was conducted. Once everything is completed, the actual system development was started.

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