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Design and Build Vespa Motorcycle Queue Service System with Android-Based Multi-Channel Single Phase Method

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ABSTRACT

The queue of the most unpleasant activities for almost everyone in the world, a queue which means waiting for their turn to get service from a facility, such as Vespa motorcycle users who want to get service to repair their vehicles in the garage easily and quickly. Repairs are carried out ranging from minor maintenance to heavy maintenance such as dismounting the engine. The irregularity of existing service queues at Vespa motorcycle workshops makes consumers feel uncomfortable and disadvantaged. Therefore it requires an easy and regular Vespa motorcycle queue service. For this we need a system that can manage the queue service process for users. The method used to regulate services is Multi Channel Single Phase, namely there are two or more service system entry lanes and there is only one service facility in each lane. This method was chosen because it is able to set the queue, speed up the work process and shorten the waiting time for customer service.

1. Introduction

In this modern era many service provider companies are competing to maximize service and performance to satisfy their customers, such as in the field of Vespa motorcycle repair services. Some Vespa motorcycle users complained about the complexity of the queues at the Vespa motorcycle repair shop, the disorderly queue that there were many users who felt disappointed and looked for other workshops or forced themselves to repair their own vehicles, which caused the providers of Vespa motorcycle repair shops could lose money because they have not implemented an orderly and controlled queuing system.

Therefore motorbike repair service providers must implement a more efficient queuing system and take advantage of technological developments that exist in this modern era. One of them is by applying web or mobile based queuing system application with Multi Channel Single Phase method.

The application of queuing system with the MultiChannel Single Phase method is widely applied in banking systems, government agencies and also in modern motorcycle workshops, because it greatly helps the service to shorten the waiting time of the customers.

The application of the queuing system will greatly help the performance of Vespa motorcycle repair shop service providers, therefore it is very helpful for customers to take the queue number in an orderly and controlled manner by the service provider, the orderliness of the existing queue is one of the reasons customers become satisfied and will bring up customers - other customers who want to use the service of the workshop.

2. Research Methodology

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This research methodology explains in several stages of the research are as follows: The development method used is to use object-oriented methods, using the Prototype software development model through the Multi Channel Single Phase model approach. The Prototype Model used in this study uses the following stages:

A. Application Planning

At the planning stage the activities undertaken are pre-research preparation activities by collecting data at the Vespa motorcycle repair shop using observation, assessment or feasibility studies methods, both operational feasibility and technological feasibility.

B. Analysis

System analysis is carried out to provide direction and determine the stages of the problem statement viz

a) Problem solving
b) Identification of needs
c) Need analysis
d) Hardware requirements analysis
e) Analysis of the running system.
f) System Feasibility Analysis

C. System planning

System Design is to design a detailed system based on the results of the analysis of existing systems, so as to produce a new model that is proposed. The system design is carried out with the following stages:

a) Work system design
At this stage, describing the design of work processes that are currently running or will be built is illustrated through the activity diagram.
b) Software Design
In designing software using Sublime, xampp and also using flowcharts to explain the database design that will be used.
c) Screen Design.
The screen design is needed to represent the display form before it is implemented.

D. Results and Implementation

At this stage is the process of displaying the results of the design in the form of a program screen display.

E. Design Results According to Research Methodology

In accordance with the research methodology that has been prepared, it can be seen the analysis and general design of the development of this application.

a) Stages of the process that occurs manually
Based on the analysis of the problem outlined earlier, the manual queue ordering procedure at the Vespa SMG workshop can be seen from the following figure:

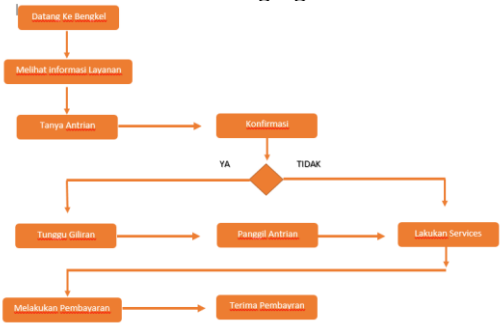

Fig 1. Manual Queue Procedure

Caption :

- Customers come directly to the Vespa Workshop
- See service information for services on the poster.
- See if there is a Mechanic or Mechanic who is not serving customers.
- If there is a Customer Vespa that is being services, the new Customer is waiting his turn
- If there is no customer directly can ask a mechanic to perform the services
- The customer provides information Request services Services requested
- Mechanics can do and receive service information requested by customers
- After services, customers can make payments at the cashier

b) The process of software design stages
In software design, several diagrams are used as shown in the figure below:

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1) Usecase diagram

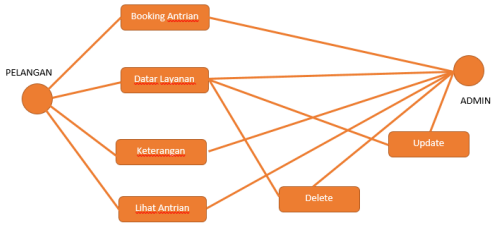

Fig 2. Main Menu Design

Caption :

- Customers can register users
- Customers can make a queue booking
- Customers can see and choose the services offered.
- Customers can provide information to the Admin
- In addition the admin can update, add and delete sevices and queue services.

2) Activity diagram

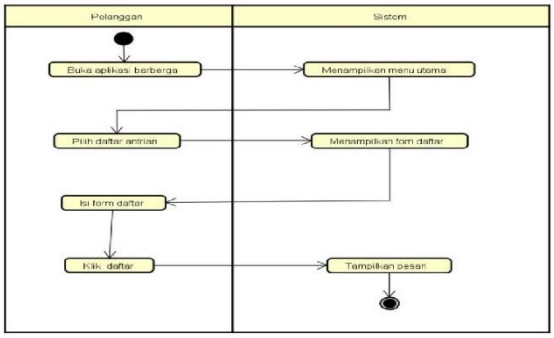

Fig 3. Queue list activity diagram

Caption :

The picture above shows that,

- The customer opens the application, then
- The system displays the main menu.
- To do a queue list, the customer opens the list menu.
- The system displays a list form that must be completed by the customer in the form of a name.
- After completing the required forms, click list. Then,
- The system will display a message in the form of a queue number to the customer to follow the procedure

3) Sequence diagram

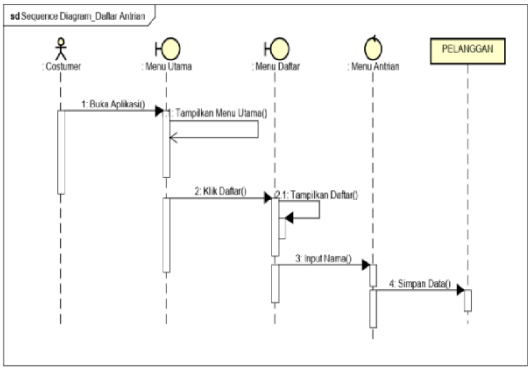

Fig 4. Sequence Diagram of a Queue List

The picture above is a Sequence Diagram queue list that illustrates the processes that are happening in the queue list. The process starts with the user entering the list form first, then the user can then turn to the queue by entering a name to enter the system. Data will be stored in the Customer database.

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4) Application Flowchart

Below is a constructed flowchart, which is described as follows:

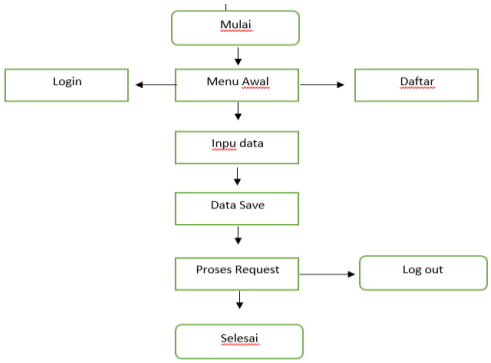

Fig 5. Application Flowchart

The flowchart above shows the application work system which consists of 9 processes which are starting, starting menu, login, list, input data, save data, request process, logout, and finish.

c) Multi Phase Single Channel design in the application

The research was carried out using the Multi-channel – single phase method as shown below:

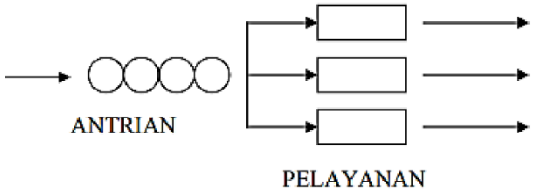

Fig 6. The concept of Multi-channel - single phase

This model is highly recommended in the concept of queuing at the Vespa Services MSG Workshop. The concept of this model is for the queuing model which has many channels or channels or many service doors, but does not have convoluted stages like bureaucracy. In this model, every customer who gets a queue call will be immediately executed at one stage then finished, not executed with a long process step [2]

The concept of Multi Phase Single Phase can be clarified in the structured diagram as follows:

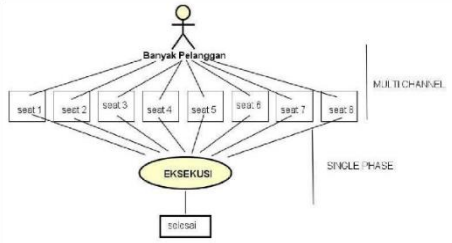

Fig 7. The Concept of Multi Phase Single Phase

3. Results and Discussion

A. Device Requirement

In this study the authors use hardware, the details are as follows:

Table 1
Hardware Specifications

Device	Specification
Processor	AMD Quad Core A6-7310
VGA	AMD R5-M230 1 GB
Hard drive	Internal 500 GB
RAM	2GB

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B. Screen display

Below this is the proposed screen display, the authors describe as follows

a) Welcome Screen Display

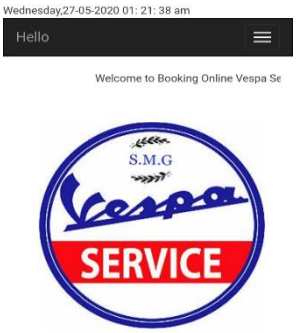

Fig 8. Display Welcome Screen

The description of picture 8 shows the initial appearance in the opening menu on the application after it is built, equipped with symbols from the SMG Vespa Service.

b) Display Screen Sign in

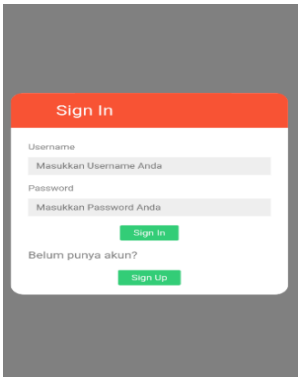

Fig 9. Sign in screen display

Figure 9 shows the Sign in screen showing the sign in form to input the customer's username and password and the menu to register as a new user.

c) Display screen for registering a User

Fig 10. User register screen

In Figure 10 it is explained that the menu for registering users is equipped with several menus, yes it is input username and password

d) Display list of services

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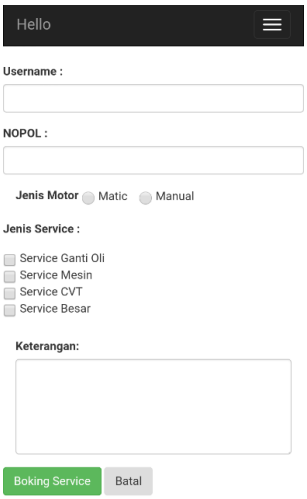

Fig 11. Display List of Services

Figure 11 explains the menu display after a successful login. In this menu display the user is expected to fill in the username, police number. And also provide a checklist or choice of type of motor and type of services. In this menu also features to be able to provide information or a kind of request for additional orders for services when done.

e) Display Queue Number Lists

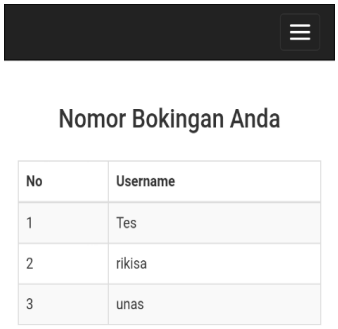

Fig 12. List of queue numbers

In Figure 12 gives a description of a list of serial numbers and the remaining customers who have booked for services using the application.

f) Admin Management Screen Display

Fig 13. Display WEB Admin

Figure 13 shows the management page display for the admin from the server side, the admin can monitor all queue message transactions, cancel or monitor the activities of the mechanics and technicians on duty. There are 5 main functions for the admin on this page, namely the settings menu, Historical visitors, Queue Control, information and product management. Besides that if more than one admin is needed, the name of the admin in charge will be recorded on this page according to history.

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4. Conclusion

From the results of the research conducted it can be concluded that the application with the Android-based queue model using Multi Channel single phase is able to facilitate customers to order queues online and in real time using their smartphone without having to come first to the Vespa Services SMG workshop to do services. In addition, by using this application the customer can estimate when to come to the service by looking at the progress of the queue number list in the application. To improve this application it is recommended to be able to use the time event or time boxing method to be able to impose limits on customers according to a predetermined time. This is useful for the management to overcome problems for customers who have ordered but did not come. Although the log out menu has been provided, sometimes the customer is lazy or forgets to 'click' the log out menu, so that it can be anticipated by the existing data method or the data has been stored.

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