



# RUJATRANS Application (Android-based Public Transportation Travel Route Information) using Waterfall Model

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## ABSTRAK

This research aims to help the public to provide public transportation information. By using this application, it is hoped that people can choose the right and efficient transportation to travel. Rujatrans (public transportation travel route information) uses waterfall model. The system includes an Android mobile app, which allows users to search for the right and efficient transport travel route while traveling. The four phases of the system are data collection, design, implementation, and testing. The system provides a user-friendly interface to provide public transport travel routes efficiently. This study uses a structured and iterative approach, resulting in solutions when you want to travel using public transportation that meets user needs. Rujatrans can provide solutions to reduce the use of private vehicles so as to reduce congestion on the highway.

**Key words:** Angkutan, Metode Waterfall, Mobile App, Rute.

## 1.INTRODUCTION

Public transportation is one of the important aspects in people's daily lives. This is because public transportation can help people to carry out daily activities, such as going to work, school, or other social activities. [1] Financially affordable transportation systems operate efficiently, provide alternative modes of choice and support the pace of economic development. [2] The dominance of the use of private vehicles became a bad culture for society. This new culture makes people tend to be less mobile, so it is easy to be infected with non-infectious diseases. The city's air quality is automatically polluted with pollutants that are very harmful to health. [3] However, with so many public transportation available, people often have difficulty in choosing the right public transportation for their travel route. Lack of information often makes it

difficult for transportation users to find the most optimal public transportation number to travel from one location to another. By just looking at the map and asking others, someone will need a long time in determining the public transportation that has the shortest distance to the destination location and sometimes the information obtained is not right. [4] Therefore, there is a need for an application that can help people to choose public transportation according to the trip. By using this application, it is hoped that people can choose the right and efficient transportation in traveling.

## 2.METHOD

The model used in the development of the RUJATRANS application is the waterfall model. The advantage of using waterfall models is that they are able to identify data needs long before the programme starts and limit changes to needs as the project progresses. Stages of research in writing this research:

### A. Data Collection

Data collection techniques consist of:

1. Literature Review.  
A thorough literature review of relevant material such as books, journals, articles, and online sources.
2. Observation.  
Conducted directly at the location of the Medan City Transportation Office to identify application design needs and data collection for system design needs.
3. Design Needs.  
The design phase involves defining the requirements required for the design of the application, including the devices used, the database, and the teams involved in the design process.
4. System Analysis and Design.  
Crunch data collected from previous phases and turn them into prototypes. This phase includes designing the interaction of system functions and objects,

creating schemas and databases, and designing user interfaces.

5. Implementation.

At the implementation stage, the design is transformed into code using several programming languages to create an interoperable application system.

6. Application Testing

At this stage the application is tested to direct users to find out the errors that exist in the system. If the system runs smoothly, it means that a functional is declared feasible or valid, vice versa if a functional is not as expected, there is an error in coding.

7. Report Writing

A final report is written detailing the methodology and theory.

**B. Application Modeling Tools**

To provide a clear understanding of system design using flowchart modeling, which is drawn in the form of diagrams and lines to display one process to another. Thus, facilitating the visualization of application design and information in the software process [5].

By using flowchart modeling, application design can be represented in the form of symbols and different types and functions. Each view depicts a series of start-to-finish processes to identify and resolve potential problems and improve application design[5].

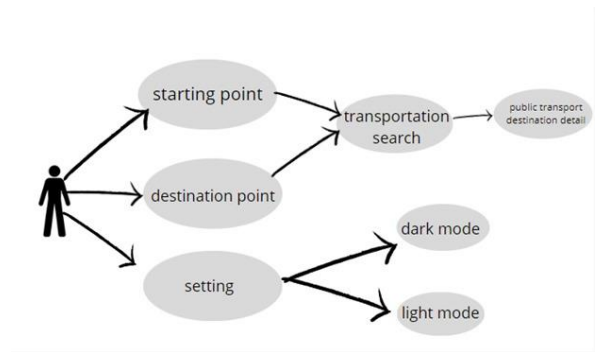
**3.RESULT AND DISCUSSION**

*a. Communication*

The communication stage is the stage of collecting public transportation information which is used as a requirement to make a product. Information collection can be done through literature study and direct observation to the Medan City transportation office.

*b. Planning*

The planning stage is the stage of planning the technical tasks performed and the necessary resources. At this stage, several needs analysis is carried out which is used to design the system, namely functional needs and non-functional needs. System requirements are designed using use case diagrams that can provide a complete picture of the interactions that occur between actors and the developed system. It can be seen in figure 1.



**Figure 1:** Use case user

*c. Modelling*

Modeling is used to simplify the problem. In this phase, the requirements specifications from the previous stage will be studied and the system design will be prepared. System design helps define hardware, determine system requirements, and define the overall system architecture. Prototype design is classified into:

1. User's homepage

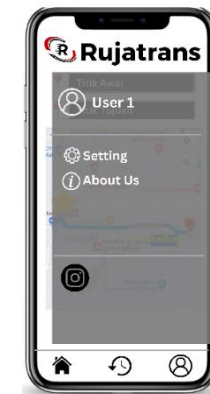
This page is the main view that users can see when opening the application, can be seen in figure 2

**a) User main page view**



**Figure 2:** User main page view

**b) User main page view**



**Figure 3:** User main page view

**d. Construction**

Construction is the code creation stage. Coding is the process of translating a design into a language that a computer can recognize. This stage is the real stage in the application process. The programmer will translate the request requested by the user then the application will respond according to the user's request. At the construction stage, the team will create code using the Android Studio IDE (Integrated Development Environment) and MySQL as a database. This application is developed based on Android phones using the Flutter framework dart programming language. Here are the results of the user interface design:

**1. Initial View (Homepage)**

This page will appear for the first time after clicking the rujatrans application, in this display there is a text column which enters the starting point and destination point in order to find transportation that will pass the pre-filled point can be seen in Figure 3:



**Figure 4:** Homepage

**2. Activity View**

This display will show how the application runs, when it has filled in the starting point and destination point of a location and pressing the search button for public transportation, the system in the application will display information on the transportation number that will go through the pre-filled route can be seen from figure 5:



**Figure 5:** Activity View

**3. Settings View**

In the settings display there are theme features both dark theme and light theme, and there is also a feature to know the developer of the application.can be seen in figure 6.





**Figure 6:** Settings View

**e. Deployment**

The deployment stage aims to carry out the stages of system implementation to users. After the team has carried out development, it will continue at the stage of implementing RUJATRANS. This application will be implemented by the team to make it easier for people when choosing public transportation. If the output results are in accordance with the expected functional needs, it means that a functional has been fulfilled and declared feasible or valid. Vice versa if the test step has been carried out but the expected results do not match the expected output, it can be stated that there are still errors at the time of coding. In essence, the purpose of Blackbox testing is to observe for the possibility of missing functions or errors at the time of coding. Table 1 shows some test results with Blackbox.

**Table 1:** Blackbox Test Results

Features	Test steps	Expected results	View	Status
Transportation search	No Enter starting point and destination point	Message Enter the starting point and destination.		Succes
Settings	Selecting dark or light mode	Mode switching		Succes

#### 4.CONCLUSION

Responding to community problems when traveling, it is necessary to make applications that make it easier for people when choosing public transportation. Currently, there are several applications that apply similar things, but information about public transport travel routes does not match the facts. The Rujatrans application (information on public transportation travel routes) is here to solve these problems, with this application people can easily get the necessary transportation information according to the travel route when they want to travel using public transportation.

The success of this project can be attributed to the collaborative efforts of all stakeholders involved, including developers, end users. The iterative approach allows for continuous feedback and improvement, resulting in a system that accurately meets the needs of its users.

This project is an excellent example of the importance of involving end users in the development process, as well as the importance of using an iterative approach in software development. The success of the Rujatrans app has the potential to inspire other organizations to increase the use of public transportation rather than the use of private vehicles. Thus this application can be useful for the community in the years to come.

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