

DEVELOPMENT OF RENOVIN APPLICATION FOR ESTIMATION OF HOME RENOVATION COSTS AND SEQUENT SEARCH RECOMMENDATIONS BASED ON ANDROID

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ABSTRAK

Home renovation is an activity carried out to renew, repair or replace part of a house to achieve better conditions. However, there is a problem that the community has difficulty finding information on the price of material that results in waste when the community renovates the house. People also have difficulty finding experts or laborers due to lack of information obtained by the community. Therefore, there is an idea to build a renovin application with an Android base which is the most widely used mobile device. The renovin application has a function to provide market price information on estimated materials for home renovation costs that include tile, walpaper and glass paint work. Other functions, the renovin application can recommend the nearest builder. The technology used to provide recommendations for the nearest mason, namely google direction fire technology and for pricing information about renovin application materials using fire from market place Bukalapak besides that, renovin application is built with an object oriented approach. The renovin application that has been built is expected to make it easier to get the estimated material price information and provide recommendations for the nearest expert or handyman.

Kata kunci : *home renovation*, Android, Aplication Rekomendation

1. PRELIMINARY

Home renovation is an activity carried out to renew, repair or replace part of a house to achieve better conditions [1]. But in doing home renovation is certainly not easy, there are complaints from home renovators Based on the results of questionnaires that have been distributed to people aged 20-40 years, it can be concluded that 75% of people stated that renovating houses often takes waste of material, due to lack of information obtained when there is

a change in market prices and the difficulty in determining the amount of material needed for house renovations so often when people buy building materials often wasteful, because a lot of material is left and unused, resulting in a waste of money in the purchase of materials other than that 59.6% of the people said they did not know the nearest handyman information so sometimes the homeowner difficulty finding the nearest handyman.

Based on these problems, it is thus made an android-based application to help find estimates of home renovation costs so that it can reduce waste in purchasing materials and recommendations of the nearest handyman to help facilitate renovation users to find repairmen. The choice of Android as a basic platform to be accessed via the internet network so that information on changes in prices of materials and information of the nearest handyman is faster and more efficient. The android platform also supports GPS technology, the Global Positioning System (GPS) is a tool or system that can be used to inform users where it is (globally) so that it can facilitate information on nearby builders based on the user's location.

Based on the description above, a Renovin application will be built which is available for smartphone users with an Android operating system with the aim to:

1. Helping the community in providing market price information on materials for home renovation so as to prevent waste when people buy materials.
2. Helping the community in finding the closest builder.

2. CONTENT THE PROBLEM

2.1 Home Renovation

Home renovation is an activity carried out to renew, repair or replace part of a house to achieve better conditions.

Judging from the scale, the renovation can be in the form of small workmanship, such as just replacing the bathroom wall tiles that are medium-scale like breaking down the kitchen, to a large scale such as overhauling the entire room in the house. Meanwhile, if seen by its objectives, various reasons were raised by the homeowner about the renovation. Some of the commonly encountered are reasons such as: building houses damaged, the need for rooms in the house increases, homes are less comfortable, home design tastes change and periodic care [1].

2.2 Job calculation

Job calculation is a feature that makes it easy for general users to calculate the use of materials based on work unit price analysis (AHSP) published by BALITBANG PU. This is intended so that general users can find out the estimated user materials including wall paint, tile work, paper work and Glass Work.

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1. Cat Works

Painting 1 m2 of new wall. 1 Plamuur paint layer, 1 layer of base paint, 2 layers of cover paint)

Table 1. New Wall Paint Work Standards

No	Ingredients	Unit	Koefisien
1	Plamur	Kg	0,10
2	Base paint	Kg	0,10
3	Close paint	Kg	0,26

Painting 1 m2 of old wall. (1 layer of base paint, 2 layers of cover paint)

Table 1. New Wall Paint Work Standards.

No	Ingredients	Unit	Koefisien
1	Base paint	Kg	0,12
2	Close paint	Kg	0,18

Painting 1 m2 of old wall. (1 layer of base paint, 2 layers of cover paint)

Table 3. Standar Pekerjaan Walpaper [10].

No	Ingredients	Unit	Koefisien
1	Walpaper	m ²	1,20
2	Glue	Kg	0,20

Tile Works

Installation of 1 m2 gray PC tile floor 20cm X 20cm

Table 4. Standard Gray Pc Tile Work 20xmX20cm.

No	Ingredients	Unit	Koefisien
1	Gray tiles	Bh	26,50
2	Cemen Portlan	Kg	10,40
3	Sand	m ³	0,045

Installation of 1 m2 PC tile floor color 20cm X 20cm

Table 5. Standard Pc Tile Color Works 20xmX20cm.

No	Ingredients	Unit	Koefisien
1	Color tiles	Bh	26,50
2	Cemen Portlan	Kg	10,40
3	Sand	m ³	0,045
4	Color cement	Kg	1,62

Glass Works

Installation of 1 m2 of glass 3mm thick

Table 6. Standard 3mm Thick Glass Works.

No	Ingredients	Unit	Koefisien
1	3mm thick glass	m ²	1,10
2	Sealant	Kg	0,05

Installation of 1 m2 of glass 5mm thick

Table 7. Standard 5mm Thick Glass Works.

No	Ingredients	Unit	Koefisien
1	5mm thick glass	m ²	1,10
2	Sealant	Kg	0,05

The formula for calculating work is

Area width * coefficient = Calculation result [10]

Example calculation calculation as follows

Diketahuai Wall Area 20 m²

The AHSP data are as follows:

Table 8. New Wall Paint work standards

No	Ingredients	Unit	Koefisien
1	Plamur	Kg	0,10
2	Base Paint	Kg	0,10
3	Close Paint	Kg	0,26

To calculate the calculation is for painting 20 m2 of new walls. 1 Plamuur paint layer, 1 layer of base paint, 2 layers of cover paint)

Area width * coefficient = Calculation result
Plamur coefficient $0.10 * \text{Area } 20 \text{ m}^2 = 2\text{kg}$
Base coefficient $0.10 * \text{Area } 20 \text{ m}^2 = 2 \text{ Kg}$
Cover coefficient of $0.26 * \text{Area of } 20 \text{ m}^2 = 5.2$
Kg
So the calculation results are for painting 20 m² of new walls. 1 Plamuur paint layer, 1 layer of base paint, 2 layers of cover paint)

Plamur coefficient $0.10 * \text{Area } 20 \text{ m}^2 = 2\text{kg}$
Base coefficient $0.10 * \text{Area } 20 \text{ m}^2 = 2 \text{ Kg}$
Cover coefficient of $0.26 * \text{Area of } 20 \text{ m}^2 = 5.2$
Kg
After that the user can estimate the price by means of the user entering the number of estimates that are recommended. Examples of known Plamur ingredients require 2 kg to be applied, some material material will appear with varied prices, for example, the user chooses Plamur at a price of Rp. 25,000 / kg
So Total Estimation = Price of goods * Amount of Buy is $25000 * 2 = 50000$
So it is produced that the estimated price for 2 kg of Plamur is Rp. 50,000 [1].

2.3 API Bukalapak

Bukalapak Fire on renovin application is used to retrieve data on building material prices. As for the workings of Bukalapak Fire in the renovin application, the Bukalapak Fire will send a request to the Bukalapak server to send material data after the user request.

2.4 Google Direction API

This Google Direction API allows us to recognize directions or routes between 2 or more coordinate points. By utilizing this API we can draw the route line or often known as Polyline. In addition to the route if you also get information in the form of distance, the estimated time arrives until the steps of the road that we must pass. The way Google deraction works in the Renovin Application is as follows:
Tukang's recommendation is a recommendation given to general users to get the nearest builder. the steps in providing the nearest handyman are as follows:
1. Search first The nearest worker to the nearest distance from the search location where the distance value is obtained from the distance value on google maps.
2. Determine the latitude (latitude) and longitude (longitude) values and compare them to determine the closest distance.
3. After getting the distance of each location of the nearest artisan, determine the maximum distance of the field search.

The following is an example of the nearest Tukang recommendation analysis:

It is known that there is a nearby User with a longitude (longitude) and latitude (latitude) as follows:

User

Known Latitude = -6,8127971

Known Longitude = 107,626404

If you know the latitude and longitude values of the initial location of the search, the next step is to get the distance value of each nearest handyman from the initial location of google maps. The following are the results of the distance obtained from the search point. The distance of the user in Daerh Dago to each nearest handyman: Mr. Mustache = 10 km, Mr. Padli = 13km and Mr. Romli = 15km.

So that the nearest handyman from the location of the user in the dago is a handyman pak Kumis with a distance of 10 Km [2].

2.5 Design analysis

System analysis can be defined as the decomposition of a complete system into its component parts with a view to identifying and evaluating the problems that occur and the expected needs so that improvements can be proposed. Analysis can be interpreted as research on an existing system with the aim of designing a new or updated system. In the process of making an absolute system, research and analysis of the system to be built is carried out.

2.6 Problem analysis

Problem analysis is a description of the problem based on the identification of problems in research on the development of a journalist interview recorder application on the android platform.

When renovating the house there are several problems that occur in the community. The problem that occurs is that some people find it difficult to obtain information on the market price of materials, so there is often waste in purchasing building materials. In addition, when the user wants to find the nearest builder, the user has difficulty obtaining information due to the lack of information available.

Therefore the researchers will conduct "Construction of the Renovin Application for Estimating the Cost of Home Remodeling and the Nearest Android-Based Builder Search Recommendation" which is expected to assist the community in providing information on estimated material prices, and the search for the nearest handyman.

2.7 Input Data Analysis

Analysis of input data is an explanation of the inputs needed by the existing system.

Input data used in the system to be built is the building area for estimating the amount of material and output data is the amount of building material.

2.8 Functional Software Requirements Specifications

The following are functional Software Requirements Specifications.

Table 9. Spesifikasi Kebutuhan Perangkat Lunak Fungsional

Kode FRSR	Functional Software Requirements Specifications
FRRS01	The system provides facilities for users to register
FRRS02	The system provides facilities for users to login
FRRS03	The system provides facilities for users to choose the nearest handyman search
FRRS04	The system provides facilities for users to see the nearest repairer's recommendations
FRRS05	The system provides facilities for users to see the details of the builder
FRRS06	The system provides facilities for users to choose paint jobs
FRRS08	The system provides facilities for users to search for paint material
FRRS09	The system provides facilities for users to choose wallpaper jobs
FRRS10	The system provides facilities for users to search for Wallpaper material
FRRS11	The system provides facilities for users to choose glass jobs
FRRS12	The system provides facilities for users to choose Tile jobs
FRRS13	The system provides facilities for users to look for Tile material

Table 10. Spesifikasi Kebutuhan Perangkat Lunak Non Fungsional

Kode SKPL	Spesifikasi Kebutuhan Perangkat Lunak
FRRS01	The system built is divided into two subsystems, the user system and the workman system.

FRRS02	The system is built at least Android operating system version 4.4 Kit Kat up
FRRS03	The system is built with hardware specifications that meet minimum requirements
FRRS04	The system is built with software specifications that meet minimum requirements
FRRS05	The system is built using the Google Maps API to get the distance value between the search point and the location of the nearest artisan

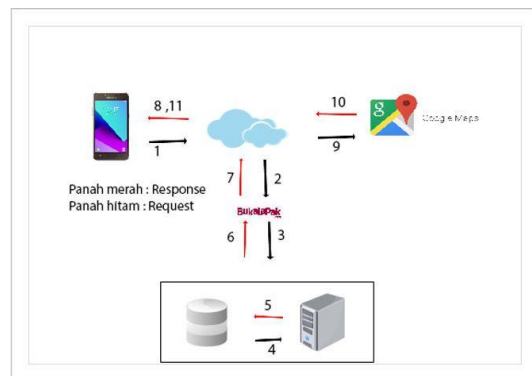
2.9 System User Analysis

Analysis and user needs are intended to find out how far the users of this system are. It aims to determine the characteristics of users in operating the existing system, as well as the proposed system. Users who will be involved in the system are:

1. Users of renovation services, tasked with using the application according to their access.
2. Builders, tasked with using applications according to their access.

2.10 Application System Architecture

System architecture analysis aims to identify the architecture to be built. The following is a picture of the system architecture from the renovin application:



Picture 1. Renovin Application System Architecture

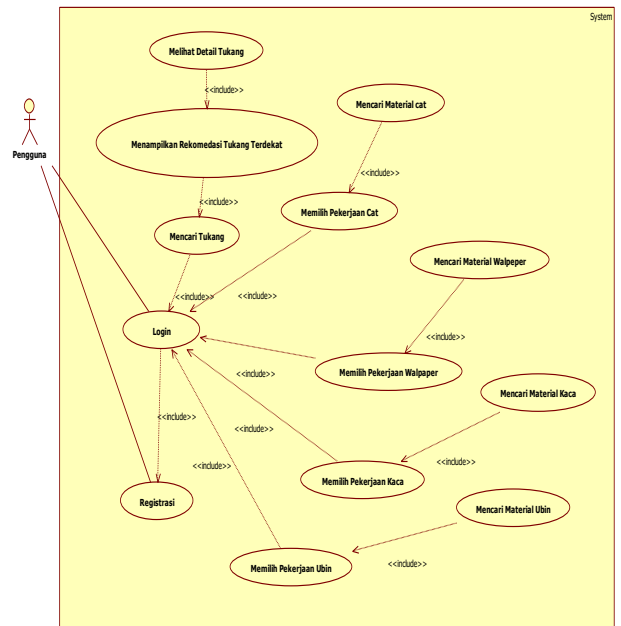
1. The user requests a request for information on the price of building materials and the application will make a request to the Bukalapak API and Bukalapak server to send the price data of the building material.
2. The user gives an order to find the nearest handyman then the application will detect

the user's location by using GPS facilities via satellite.

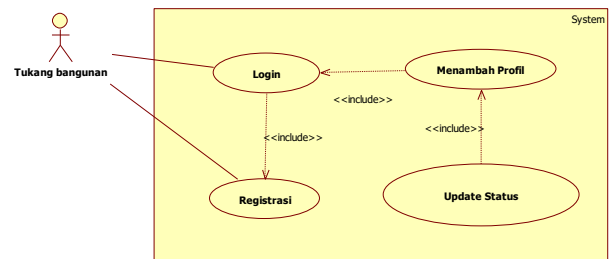
3. Then the location detection results will be in the form of latitude and longitude coordinates.
4. Then the application sends a request to the Google Maps API.
5. Furthermore, the Google Maps API will send the data requested by the user in the form of a handyman shaped map.

2.11 Digram Usecase

The use case diagram provides a way of describing external views of the system and its interactions with the outside world. The following are use case diagrams for general user applications and artisan users.



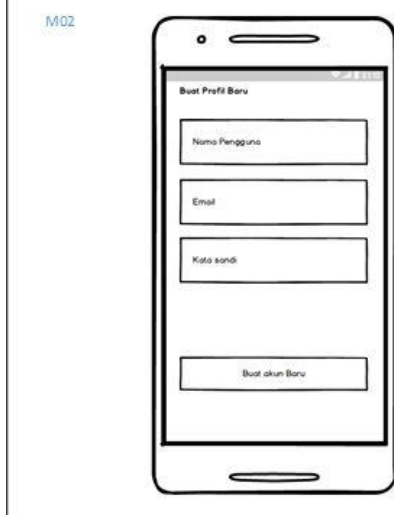
Picture 2. Use General User Case Diagram



Picture 3. Handy User Use Case Diagram

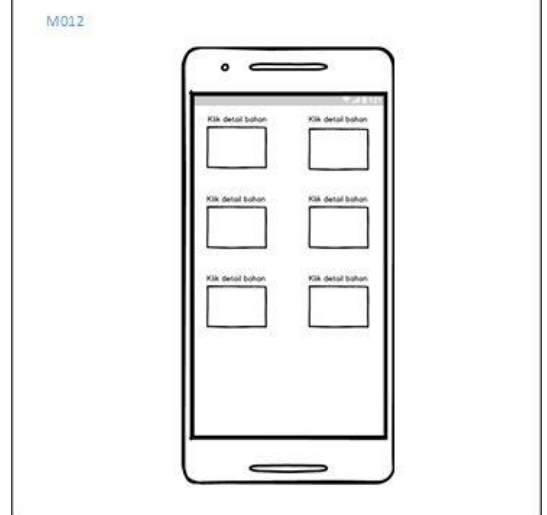
2.12 Interface design

Designing the Registration interface



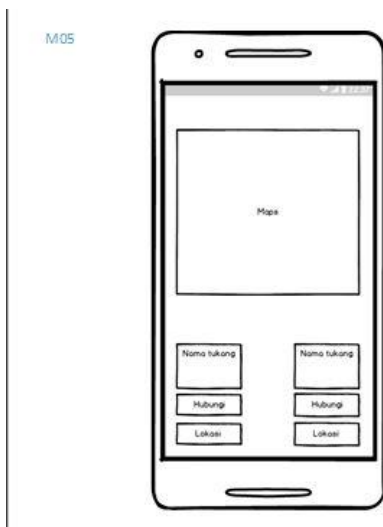
Picture 4. Registration Interface

Designing a Cat Work interface



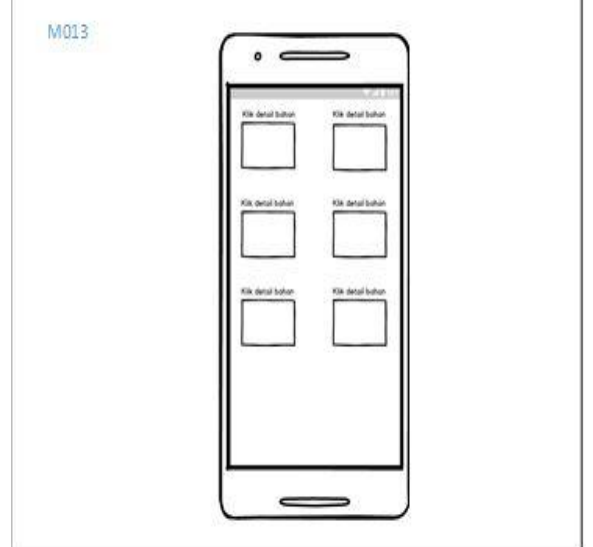
Picture 6. Cat Work Interface

Designing the Detail Builder interface



Picture 5. Builder Detail Interface

Designing for Paint Materials



Picture 7. Interface Looking for Paint Materials

3.0 CLOSING

Concluding remarks contain conclusions and research suggestions.

1.1 Conclusion

Based on the results of the Renovin application testing on the Android

platform, the following conclusions are obtained:

1. The renovin application can make it easier for users to search for material information and estimate the cost of home renovation materials.
2. Applications can make it easier for users to search for information on nearby builders.

3.1 Suggestion

The Renovin application that is built is an application that focuses only on the estimated cost of renovation in the form of Paint, Tile, Walpaper Glass and the closest builder

recommendation. Therefore, there are some suggestions that can be used as a reference for the development of this software in the future in a better direction so that it can keep up with technological developments. The suggestions for renovin application development are as follows:

1. Developing platforms that can be supported by applications which currently only support the Android platform.
2. Add more work to be more efficient and varied in the user choosing renovation.

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