

LOOKING FOR QUR'AN TEACHER WITH THE HAVERSINE FORMULA METHOD

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Abstract-- Education to read and write the Qur'an is the most important thing in Muslim life. The problem that arises is the difficulty of getting a schedule fit between prospective Koran teachers and students, besides the lack of places to study the Koran for adults is also a problem that should be a concern for the sake of the ongoing process of learning the Qur'an.

The research method used in this study is a qualitative research method with an experimental approach for programming methods using the Haversine Formula method.

The results of this research are in the form of the development of Private Recitation Service and Report Applications Using the Android-Based Haversine Formula Method which can be used to facilitate the community in the process of searching for private Using the Haversine Formula Method Based on Android with distance calculation accuracy rate is 98.92%

Keywords: Android, Haversine, Services and report

I. INTRODUCTION

Al-Qur'an literacy education is the most important thing in the life of Muslims. Every Muslim has the right to receive education in reading and writing the Qur'an and always developing in it. Al-Qur'an literacy education in general is a life process in developing each individual Muslim to be able to carry out his life

The process of learning the Qur'an knows no age limit seeing the reality out there that there are still many people who are not fluent in reading the Qur'an but the lack of places to study the Qur'an for adults sometimes makes them discouraged from

learning Al-Qur'an. -Qur'an this is usually because they are embarrassed if they join the children in kindergarten / TPA.[4]

The Qur'an teacher plays a very important role in the guiding process starting from the introduction of letters to Makharijul letters so that it can be said that the presence of the Qur'an teacher is the most urgent thing for the continuity of the Qur'an teaching and learning process.[2]

The presence of an electronic device called a smartphone is a good enough strategy to facilitate the process of finding private Qur'an teachers by utilizing a smartphone as a tool, besides that the design of this application will be equipped with a student learning outcome report feature, where the Qur'an teacher will not only carry out the teaching process but will also perform the assessment process of each development of learning material carried out by students which of course can make it easier for parents to carry out the process of monitoring their child's learning development without having to participate in their child's learning process[3]

To build a system that can search for Qur'an teachers who can recommend the closest location from searches made by students, researchers use a method, namely the Haversine Formula.

The Haversine formula is an equation that gives the distance of a large circle of radius from one point to another on the earth's surface based on longitude and latitude. The Haversine formula includes the right formula in calculating the shortest distance from two points, namely by inputting latitude and longitude. As the starting and ending points, the distance between nearby points will be calculated [5]

II. METHOD

In this study, the system design method used is the waterfall. The waterfall method suggests systematic and sequential software development starting from the highest system level and continuing to the analysis, design, coding, testing and maintenance stages. The advantages of this method are structured, dynamic, and sequential.

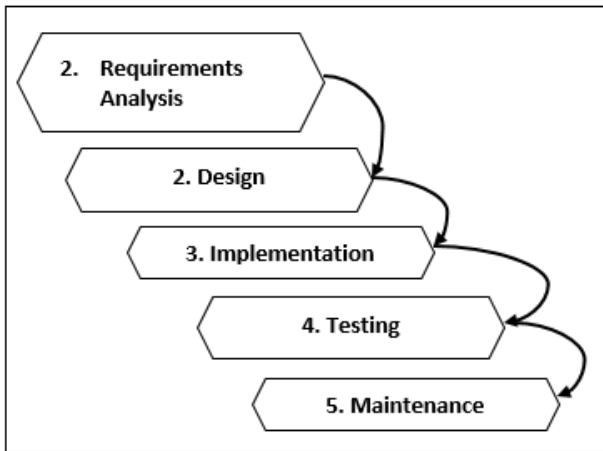


Figure.1 Waterfall Method Design[1]

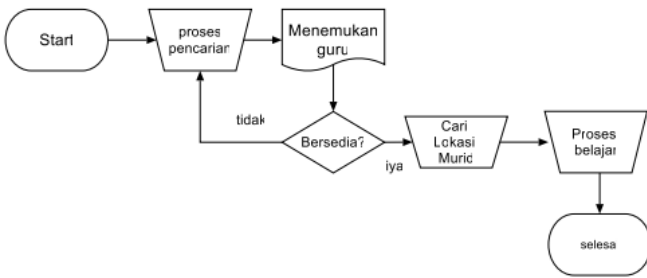


Figure 2. Flow map diagram currently running

Figure.2 above explains the stages in the process of searching for a private Qur’an teacher where students look for a Qur’an teacher manually on social media or simply asking others, of course, it will take a very long time. After finding the Qur’an teacher, the student will contact the teacher and place an order. If the teacher is willing, the learning process can be carried out if the Qur’an teacher is not willing, the student will return to the search process. Therefore, with this application, it is hoped that it can facilitate the community in the process of finding private Qur’an teachers quickly so that the Al-Qur’an learning process can be carried out properly.

III. RESULT AND DISCUSSION

1. Menu Display Looking For Teacher



Figure 3. Menu Display Looking For Teacher

Figure 3. above explains The search menu for teachers is a page that displays maps from the location of the Qur’an teacher to be ordered. In this view there is a button a message that serves to place an order for the Qur’an teacher what students want.

2. Haversine Method

The haversine method is used to calculate the lengths of two points on the surface of the earth based on latitude and longitude. Four variables must be prepared to calculate the two distances.

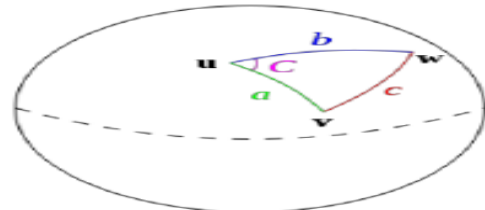


Figure 4. Haversine Method [6]

Haversine Method which serves to provide recommendations for the closest distance from the

location or address of the Qur'an teacher.



Figure 4. Master Data In Firebase For Testing

Based on the data above, the calculation value of the method is obtained Haversine formula as follows:

- $lat\ 1 = -5.1018131 * 3.14 / 180 = -0.0889982952$
- $long\ 1 = 120.2514944 * 3.14 / 180 = 2.09772051342$
- $lat\ 2 = -5.111445 * 3.14 / 180 = -0.0891663183$
- $long\ 2 = 120.2509389 * 3.14 / 180 = 2.09771082303$
- $$D = \text{acos}(\sin(lat1) * \sin(lat2) + \cos(lat1) * \cos(lat2) * \cos(long2 - long1)) * R$$

$$= \text{acos}(\sin(-0.0889982952) * \sin(-0.0891663183) + \cos(-0.0889982952) * \cos(-0.0891663183) * \cos(2.09771082303 - 2.09772051342)) * 6371$$

$$= \text{acos}(0.00791468096 + 0.99208530487) * 6371$$

$$= 0.00016834488 * 6371$$

$$= 1.07252523048\ km$$

f. Persentase Error $\Rightarrow e = \frac{ab}{a} * 100\%$

$$e = \frac{ab}{a} * 100\%$$

$$e = \frac{1,3 * 1.072}{1,3} * 100\%$$

$$e = 1,072\%$$

$$= 100\% - 1,072\%$$

$$= 98.92\%$$

Result Method Haversine :

	Latitude	Longitude	Method Haversine [Km]
Point 1	5,1018131	120,2514944	1,072800879
Point 2	-5,111445	120,2509389	



Figure 5. Result Maps System

IV. CONCLUSION

The Application of the Haversine method is very well applied to gadgets since the Google Maps using Smartphones. The Application Quran Teacher assessment can facilitate the process of finding Qur'an teachers. The results of this research are in the form of the development of Private Recitation Service and Report Applications Using the Android-Based Haversine Formula Method which can be used to facilitate the community in the process of searching for private Using the Haversine Formula Method Based on Android with distance calculation accuracy rate is 98.92%.

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