

DEVELOPMENT OF APPLICATION TO DETERMINE THE LOCATION OF SELLER AND BUYERS MEETINGS ON CASH ON DELIVERY (COD) TRANSACTION

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ABSTRACT

With so many online buying and selling forums popping up making cash on delivery activities often done by sellers or buyers, where sellers or buyers are willing to meet at a location. Ease and convenience will be obtained by both parties, the buyer can check the items to be purchased. But behind the convenience and comfort there are some shortcomings, both parties must be careful in determining the location, because there are many cases of crime with cash on delivery in a quiet place, for that it is advisable to transact in a crowded place. Therefore based on the problems that have been described, needed a solution that can solve the problems encountered when doing cash on delivery. In this study the authors discuss the problems experienced by the public when doing cash on delivery. This application uses Android platform with 76% market share consideration worldwide and uses the slope one algorithm to recommend locations, if a location does not yet have a rating then that location will not be recommended by the slope one algorithm. This research produces an application that has a feature that is able to recommend the location of the meeting and track other users when buying and selling and rating the meeting location. This application can run well on Android devices 5 and above.

Keywords: Android, Slope One, cash on delivery, Applications, Transactions

1. PREFACE

More and more diverse types of goods buying and selling transactions, especially in online commerce. In buying and selling online we as a seller or buyer can trade offline where the buyer and seller are willing to meet in a place to conduct transactions. Of course the delivery of goods can go to the buyer's house, office or even to the desired place. Excess will get if you use the transaction. Ease is clearly obtained, then speed and comfort are also ensured. The first thing that is felt is that the buyers immediately see the condition of the goods, even try it first. As a buyer can also submit an offer

if after seeing the condition of the goods there are different from those sold online, for transactions with shipping it is certain the buyers will not be able to see the condition of the goods directly.

According to questionnaire data conducted online regarding the responses of people who will make buying and selling transactions online, to 47 respondents, that as many as 74.5% are known to people who will make buying and selling transactions online the seller determines the location of the meeting while 25.5% the buyer which determines the location of the meeting.

But behind the advantages there are disadvantages, for buyers and sellers must be careful in carrying out transactions, it is very important to determine the location, it is advisable to conduct transactions in a crowded place. Because there are criminal cases with the COD (cash on delivery) mode in a quiet place [1].

Likewise, in terms of monitoring the people we will deal with, we do not know the exact location of the person we are dealing with, sometimes there are cases we have reached the destination but buyers do not come, and only waste our time. For the seller, of course this offline transaction can make the seller's image better, and be labeled as a trusted seller, and may be informed to others if they really want to buy the same item. But, the biggest risk from the seller is to give up costs for the road and the goods delivered are not bought.

To be able to build this application requires the Google map direction API which functions as determining the route of the meeting location to the location, as well as the Geofencing API to track users if they have entered the specified distance.

In recommending the location of a meeting between sellers and buyers using the slope one algorithm. This algorithm implements a process of predicting how a user will rate an item, which item has been rated by another user.

The slope one predictor algorithm consists of three types, namely the slope one algorithm, weighted slope one, and bi-polar slope one [2].

Therefore based on the above problems the author will build an Android-based application to facilitate those who want to make transactions. This application aims to help activities for anyone who

wants to make a transaction. In this research using descriptive method [18].

2. CONTENT OF RESEARCH

2.1 Application

Understanding Applications According to the Dictionary of the Big Indonesian Dictionary (KBBI) is a computer program or software designed to do certain tasks [3]. Meanwhile according to Jogiyanto the application is an application, store, something, data problem. Work into a medium or medium that can be used to implement or implement existing things or problems so that it changes into a new form without eliminating the basic values of data, problems, the work itself [4].

2.2 Slope One Algorithm

The Slope One algorithm is an algorithm for making recommendation systems. Slope one provides predictions based on the value of the search results of the items being compared. The advantage of the Slope One algorithm compared to other recommendation algorithms is that the Slope One algorithm is easy to implement, efficient when querying, does not require many requirements because recommendations are based on the rating of each item, and is quite accurate [6].

2.3 Geofence

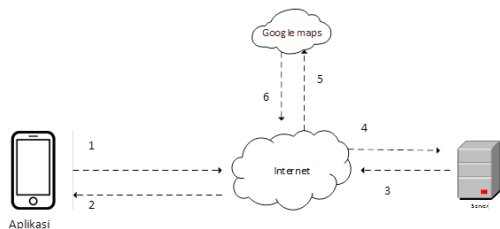
Geo-fencing (geofencing) is a feature in software programs that use global positioning systems (GPS) or radio frequency identification to determine geographical boundaries [11].

2.4 Discussion

In the discussion section will explain covering, system analysis and system implementation.

2.4.1 Systems Architecture Analysis

The system architecture will provide an overview of the process that occurs when a user is tracking other users using the Google API direction. The system model of the application can be seen in the following figure:



Picture 1. Systems Architecture

1. The process of logging into the system by checking the account
2. The process of tracking smartphone users from Google Maps.
3. The process of downloading data from the server.

4. The process of uploading data on the server.
5. The process of uploading position data on google maps.
6. The google maps process sends the user's position.

2.4.2 Algorithm Slope One Anlysis

The slope one algorithm is used to recommend locations, to be able to recommend locations a rating given by the user is required. How it works slope one algorithm is to compare the difference in the rating given by the user, if the user does not give a rating then the slope one algorithm cannot provide recommendations.

For the calculation of the slope one algorithm, it can be formulated with equation 1 to find the difference

[16] :

$$dev_{j,i} = \sum_{u \in S_{j,i}(x)} \frac{u_j - u_i}{card(S_{j,i}(x))} \quad (1)$$

Information :

1. $dev_{j,i}$ = Average item rating difference and i
2. u_j = Item rating j
3. u_i = Item rating i
4. $(S_{j,i}(x))$ = Number of elements to compare

If the difference is obtained, the recommendation for item j can be calculated which can be formulated by equation 2 [16]:

$$p^{si}(u)_j = dev_{j,i} + u_j \quad (2)$$

1. First Case

In the first case the user is in the UNIKOM campus environment with a scenario will have a meeting by selecting a location that already has a rating. Rating locations around the UNIKOM campus before going through the slope one algorithm calculation can be seen in the table as follows:

Table 1. Locations Rattng

Location	Rating
Cats and Ice Cream Dago	4
Le Favochiken Toha	5
Marema Steak Kiloan	4
Dcubes Hangout Point	4.5
Hayam Jeoss	3.5
Warung twogether	4
Warkop Giras	3
Warung Doaloer	5
Daily Routine Coffee	3
CODEART Coffee	5

$$dev_{j,i} = 10 \frac{4-5-4-4.5-3.5-4.5-3-5-3-5}{10} = -33.5$$

Then the average difference in item rating is -33.5. After the average item difference is found to

determine the recommended value for each item, the calculation is done with the following equation:

$$(u) \text{ CODEART Coffee} = 5 + (-33.5) = -28.5$$

After doing the calculation, it is known that the recommended value for the CODEART Coffee location is -28.5. Do the calculation for each location, if there are 2 or more locations that have the same rating value, locations that are closer to the seller will be recommended by the application. After knowing all the recommendation values, place them according to recommendation values.

Table 2. Results of Calculating Location Ratings

Location	Rating
CODEART Coffee	-28.5
Le Favochiken Toha	-28.5
Warung Doaloer	-28.5
Dcubes Hangout Point	-29
Warung twogether	-29.5
Cats and Ice Cream Dago	-29.5
Marema Steak Kiloan	-29.5
Hayam Jeoss	- 30
Warkop Giras	-30.5
Daily Routine Coffee	-30.5

After the location rating has passed the calculation using the slope one algorithm, the application will sort the location with the largest average value difference for the top position and the location rating with the lowest average value for the lowest location.

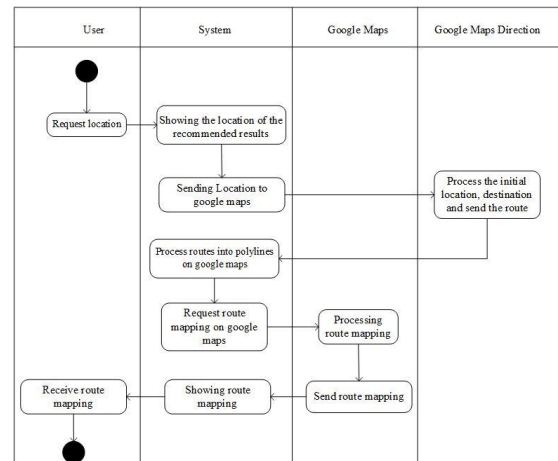
1. Second Case

After the first case chooses the destination location based on rating, then in the second case in this study the scenario will be to choose a location that does not yet have a rating. The user's position is still in the same position as the first case before, namely around the UNIKOM campus.

In the second case around the UNIKOM campus there is no place that has a rating, so if there are conditions the application will recommend the closest place to the user. The table below shows locations that do not yet have a rating around the UNIKOM campus.

1.4.3 Google Maps API

Google Maps API is used to help users to travel to the meeting location by displaying a map in the application, the route to the location is displayed in the form of polylines and the destination location is displayed in the form of markers. The Google Maps API is also used to track other users who are traveling to the same location for buying and selling. The journey to the location in the Google Maps API can be seen in the image below:

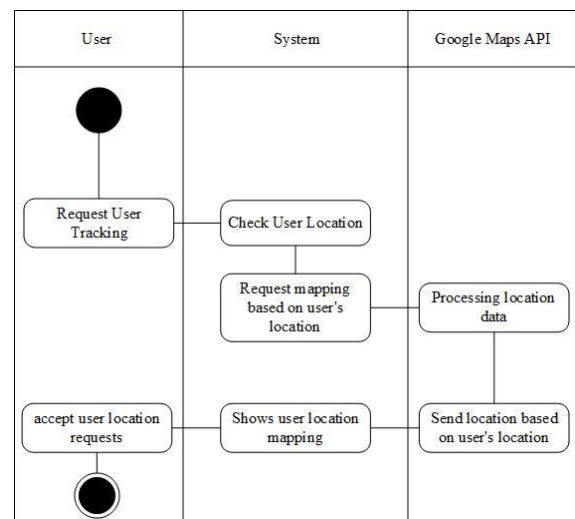


Picture 2. The Trip Process To The Location

Information:

1. The user requests a location for the meeting.
2. The system recommends meeting locations.
3. The system sends recommendations to Google maps.
4. The Google Maps API Direction processes the user's initial location and destination, and sends the route.
5. The system processes the route into polylines on Google Maps.
6. The system requests mapping the user's location based on the device's initial location, and destination. Then request a route on Google Maps.
7. Google Maps processes route mapping.
8. Google Maps sends the route mapping to the system.
9. The system displays the route mapping.
10. The user receives a route request.

For tracking users use Google Maps Marker as the location of users who are heading to the same location. The tracking feature process can be seen in the image below:

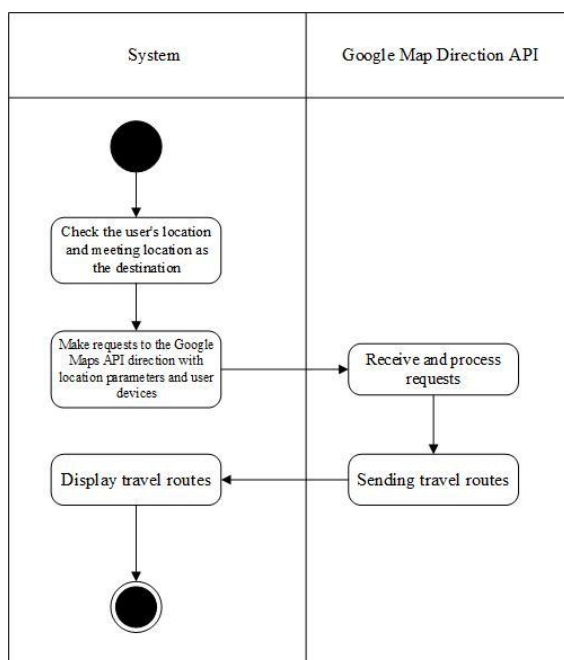


Picture 3. User Tracking Process

Information :

1. The user requests tracking other users who are heading to the same location.
2. The system checks the user's location.
3. The system requests mapping of other users to the Google Maps API.
4. Google Maps processes user location.
5. The Google Maps API sends a mapping containing the user's location.
6. The system displays the user's location.
7. The user accepts the location of other users. Google Direction API

In this research, Google Maps Directions functions to make polylines on Google Maps in the application. The process of making polylines can be seen in the image below:



Picture 4. Polylines Making Process

Information :

1. The system checks the user's location and meeting location as destinations.
2. The system makes a request to the Google Maps Direction API with the user's location parameter as the starting location and the recommended location as the final destination.
3. Google Maps Direction API Receives and processes requests.
4. The Google Maps Direction API sends the route to the system.
5. The system displays the trip route.

1.4.4 System Implementation

The system implementation lays out the required device specifications and can be shared by developers or their use. These specifications are what components the system will need, so the system can be implemented.

1.4.4.1 Implementation Environment

At this stage will explain the hardware needed to run the application so that the application to be used can run properly, the required specifications can be seen in the table below:

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Table 2. Hardware Specifications

No	Hardware	Specifications
1	CPU	1GHz
2	RAM	2GB
3	Hardisk	512 MB
4	Screen	4,0 inch

At this stage will explain the hardware needed to run the application so that the application to be used can run properly, the required specifications can be seen in the table below:

Table 3. Builder Hardware Specifications

No	Hardware	Specifications
1	CPU	Intel® Core™ i3 M350 2.27GHz (4CPU)
2	RAM	4GB
3	Hardisk	500GB
4	VGA	Intel® HD Graphicc 1696 MB

Software specifications needed to use the application to determine the location of the meeting between buyers and sellers using geofance, can be seen in the following table:

Table 4. Software Specifications

No	Software	Specifications
1	Operating System	Android Lollipop 5.1 (API Level 22)
2	Google Play Services	Versi terbaru

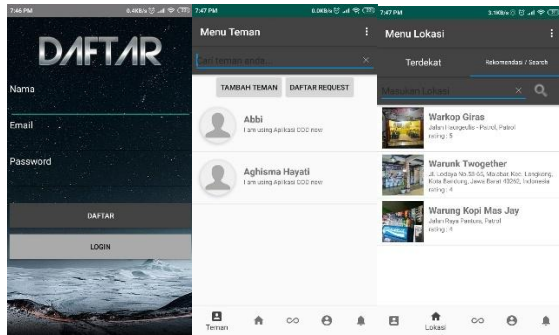
For the specification of software requirements needed for application development to determine the location of the meeting between buyers and sellers using geofance can be seen in the following table:

Table 5. Builder Software Specifications

No	Software	Specifications
1	Operating System	Windows 7
2	Programing Language	Java
3	IDE	Android Studio
4	DataBase	MySQL

1.4.4.2 Interface Implementation

After previously describing the implementation of the system, below are some pictures of the results of the implementation of the interface.



Picture 5. Interface Implementation

1.5 Testing

Stages of testing are carried out in order to find errors in the application to determine the meeting between the seller and buyer using geofence so that it can be found out that the application is in accordance with the original purpose of making or has not met. Testing using the Black Box method and testing is divided into two parts, namely alpha and beta.

2.5.1 Alpha Testing

Alpha testing is done by several users to find out if there are errors in the application. The test is accompanied by the manufacturer of the application and recorded if there are errors or problems that occur when the test is done.

1. Cases and Testing

In this stage the application functionality will try to determine the meeting between buyers and sellers using geofence. All features of the application are tested by the Black Box method, the test results can be seen in the table below:

Table 6. Testing Result

Feature	Testing Points	Result
Register	Register as a user	Successful
Log In	The user has successfully logged in	Successful
Forgot Password	The user has successfully done help forgetting password	Successful
Change Profile	The user has successfully changed the profile	Successful
Find Friend	Users managed to find friends	Successful
Add Friend	User Successfully added friends	Successful
Find Location	The user has succeeded in	Successful

	finding location	a
Tracking User	The user has successfully tracked another user	Successful

Based on the testing that has been done, it can be concluded that the functionality of the application is running well.

2.5.2 Beta Testing

Beta testing is done on the user, so users can do a direct assessment of the application to determine the meeting between buyers and sellers using geofence. Beta testing is done by the user filling out the questionnaire. From the results of the questionnaire that has been filled out by the user, each answer will be calculated with the formula below:

$$Y = \frac{X}{Skor\ Ideal} \times 100\%$$

Information :

Y = Percentage value sought

X = Number of categories of jawaban multiplied by frequency.

N = Value of each answer

F = Frequency

And assessed using the Likert method on a scale of 1 to 5.

Information :

100% - 80% = Strongly Agree

79.99% - 60% = Agree

59.99 - 40% = Neutral

39.99% - 20% = Agree Less

19.99% - 0% = Disagree

The test results can be seen in the table below.

Table 7. Question 1

	1. Does the application to determine the meeting between buyers and sellers using geofence can make it easier for you when buying and selling transactions?				
	Strongly agree	Agree	Neutral	Agree Less	Disagree
N	5	4	3	2	1
F	3	5	2		
NXF	15	20	6		
Jumlah NXF= 41		Y = (41/50)*100% = 82%			

Table 8. Question 2

	2. Does the application to determine the meeting between buyers and sellers using geofence can make it easier for you when determining the location for buying and selling transactions?				
	Strongly	Agre	Neutr	Agre	Dissagr

	y agree	e	al	e less	ee
N	5	4	3	2	1
F	4	4	2		
NXF	20	16	6		
Jumlah NXF= 42		$Y = (42/50)*100\% = 84\%$			

Table 9. Question 3

3. Does the application to determine the meeting between buyers and sellers using geofence can make it easier for you to track the whereabouts of other users when transacting?					
	Strongly agree	Agree	Neutral	Agree Less	Dissagree
N	5	4	3	2	1
F	7	1	2		
NXF	35	4	6		
Jumlah NXF= 45		$Y = (42/50)*100\% = 90\%$			

Table 10. Question 4

4. Does the application to determine between buyers and sellers using geofence can provide location information through ratings?					
	Strongly agree	Agree	Neutral	Agree Less	Dissagree
N	5	4	3	2	1
F	3	5	2		
NXF	15	20	6		
Jumlah NXF= 41		$Y = (42/50)*100\% = 82\%$			

Can be concluded from the results of application testing to determine the location of the meeting between buyers and sellers using geofence, as follows:

1. Application to determine the location of a meeting between buyers and sellers using geofence can help buyers and sellers in buying and selling transactions.
2. Application to determine the location of a meeting between buyers and sellers using geofence can help buyers and sellers in determining the location of buying and selling.
3. The application to determine the location of a meeting between buyers and sellers using geofence can help both buyers and sellers track the whereabouts of other users when transacting.
4. Application to determine the location of a meeting between buyers and sellers using geofence can help both buyers and sellers in providing location information through rating.

3. CONCLUSION

In developing applications to determine meetings between buyers and sellers using geofence, there are suggestions that this application can be better going forward. The ingredients can be seen below:

1. The application to determine the meeting between buyers and sellers using geofence can be used in the future on iOS devices.
2. Application to determine the meeting between buyers and sellers using geofence in the future so that tracking can be more accurate.

BIBLIOGRAPHY

- [1] E. Sukirman, "Hati-hati COD di Tempat Sepi dengan Kakek Ini," *Pikiran Rakyat*, 19 December 2016. [Online]. Available: <https://www.pikiran-rakyat.com/bandung-raya/2016/12/19/hati-hati-cod-di-tempat-sepi-dengan-kakek-ini-388237>. [Accessed 25 August 2019].
- [2] A. M. Daniel Lamire, "Cornell University," 24 February 2007. [Online]. Available: <https://arxiv.org/abs/cs/0702144>. [Accessed 13 May 2018].
- [3] "KBBI Daring," 2016. [Online]. Available: <https://kbbi.kemdikbud.go.id/entri/aplikasi>. [Accessed 13 May 2018].
- [4] j. Hartono, *Analisis Dan Disain: Sistem Informasi: Pendekatan Terstruktur Teori Dan Praktek Aplikasi Bisnis*, Yogyakarta: Andi Offset, 2001.
- [5] B. K. Williams and S. C. Sawyer, *Using Information Technology: A Practical Introduction To Computers & Communications*. (9th edition), Newyork: McGraw-Hill, 2011.
- [6] M. Chau, "IDC," May 2017. [Online]. Available: <https://www.idc.com/promo/smartphone-market-share/os>. [Accessed 8 April 2018].
- [7] N. S. H, *Pemrograman Aplikasi Mobile Smartphone dan Tablet PC Berbasis Android(Revisi Kedua)*, Bandung: Informatika, 2015.
- [8] "Android Studio," [Online]. Available: <https://developer.android.com/studio/intro/index.html?hl=id>. [Accessed 8 April 2018].
- [9] Supriyanto, *Pemrograman Database Menggunakan Java & MySQL untuk Pemula*, Jakarta: Mediakata, 2010.
- [10] B. Raharjo, *Belajar Otodidak MYSQL Teknik Pembuatan dan Pengolahan Database*, Informatika, 2015.
- [11] D. Namiot, "Geofence Services," *International Journal of Open Information Technologies*, vol. 1, 2013.
- [12] M. Rouse, "Whatis.com," December 2016. [Online]. Available: <https://whatis.techtarget.com/definition/geofencing>. [Accessed 30 April 2018].

- [13] "Google Wiki," [Online]. Available: http://google.wikia.com/wiki/Google_Maps. [Accessed 30 April 2018].
- [14] R. A. Sukamto, *Rekayasa Perangkat Lunak (Terstruktur dan Berorientasi Objek)*, Bandung: Informatika, 2014.
- [14] R. A. Sukamto, *Rekayasa Perangkat Lunak (Terstruktur dan Berorientasi Objek)*, Bandung: Informatika, 2014.
- [15] W. L. Tong Qiang Jiang, "Improved Slope One Algorithm Based on Time Weight," pp. 2365-2368, 2013.
- [16] "Dzone," 19 April 2010. [Online]. Available: <https://dzone.com/articles/slope-one-recommender>. [Accessed 13 May 2018].
- [17] S. H. Dharma Pratama, "Aplikasi Rekomendasi Tempat Makan Menggunakan Algoritma Slope One Pada Platform Android," *IJCCS*, vol. 1, pp. 11-20, 2017.
- [18] A. Finandhita and I. Afrianto, "Development of E-Diploma System Model with Digital Signature Authentication," *IOP Conference Series*, vol. 407, p. 2, 2018.