APPLICATION DEVELOPMENT FOR SALES VISIT AT PT.TUMBAKMAS NIAGASAKTI

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ABSTRACT

PT. Tumbakmas Niaga Sakti commonly referred to as TNS is a large supplier company. The main activity in the company is to offer the marketing solution of goods into management information. TNS has a sales role to offer products to outlets. Sales visits at outlets are conducted on a regular basis. Yet there are still many problems that need to be faced by the company. The main problem of this company is limit data of information, information fast and accurate. Sales do visiting by way of sales come to the outlet, then record the data visits on paper. Often a problem occurs when the sales recording visiting such as paper damaged, wet water or lost. The process of report processing viting sales that still require a relatively long time because the report given to the company's sales is still done by taking a note and then copied to a book called a callbook after that data from a new callbook inserted into Microsoft Excel to be a report. Sales activity visits are often difficult to monitor by the company. The company finds it difficult to know directly the activities carried out by sales such as how many outlets that have been visited by the sales and what activities are done by sales. Such information can be obtained with one technology that is technology Global Positioning System (GPS).
Keywords: sales, sales visit, GPS, outlet, android.

1. PENDAHULUAN

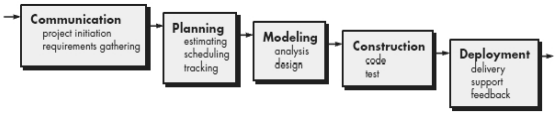
With TNS is a large enough supplier company located on Soekarno Hatta street 598 city of Bandung. The main activity in the company is to offer the marketing solution of goods into management information. The company has a wealth of experience serving every customer's request. TNS has a sales role to offer products to outlets. Yet there are still many problems that need to be faced by the company. The main problem of this company is kerterbatasan data, information fast and accurate. Based on interviews with the company, sales offer goods by visiting outlets. Sales visits at outlets are conducted on a regular basis. Sales do kunjugan by way of sales come to the outlet, then record the data visits on paper. Often a problem occurs when the sales recording kunjugan such as paper damaged, wet water or lost. The process of report processing kunjugan sales that still require a relatively long time because the report given to the company's sales is still done by taking a note and then copied to a book called a callbook after that data from a new callbook inserted into microsoft excel. Based on interviews, sales activity visits are often difficult to monitor by the company. So the company wants to optimize service so easy and flexible by applying it to flat form andorid. The way the distribution of outlets that must visit is still by collecting names ¬outlet-outlets that need dikunjungidan divide it into sales so that the division is less efficient.

In this study the application is built based on andorid. Because Andorid became a smart phone operating system used by sales at P.T Tumbakmas Niaga Sakti. The operating system is low-cost, has Usebility aspect and is very easy to learn and understand by users and OS andorid is open source, so third-party applications for andorid operating system is growing very rapidly, the more number of applications circulating for andorid-based smartphones. Although it is arguably andorid is the OS that has the youngest age than any other mobile OS, but within a few years andorid can compete with other mobile OS that has been popular first even based on survey statistics conducted in late 2011, andorid control 43% market share Mobile OS and beat its competitors [2].

Based on the problems that have been described, it can be concluded the need to build an application. Applications that will be built are expected to help companies monitor sales visits because today the company is still difficult to monitor sales visits and still less efficient in the distribution of places to be visited by sales, so that sales visit information can be monitored directly then aplication built based on andorid. By using technology of Global Positioning System expected company can know information about sales visit. To find out the outlet that the app visited using GPS technology. Buiild of aplicaton this application is also expected to assist the sales in processing the data visit report because at this time the process is done by noting it in paper other than the data easily damaged the process of making relatively long.

1.1 RESEARCH METHODS

Method is a process used to solve a problem logically, research method used is descriptive methodology because in this research get facts, symptom and look for factual explanation about existing problems and get justification to as well as ongoing practices
[1].
1. Litelatur Study The major lithologic study of this study comes from several books, journals, related papers in this study with software development
2. Interview Interview is a way of collecting data by face to face face to face, interview done by giving some question to PT.Tumbakmas Niaga Sakti.
3. Observation Observation is the collection of data by caramelakukan retrieval and recording directly on the object of research with the aim to obtain the data - data required in research



Gambar 1. 1 metode penelitian.

1.2.1 Aplication

Application is a use in a computer, instruction (instruction) or statement (statement) arranged in such a way that the computer can process the input into output [3]. According to Dictionary of Big Indonesian Dictionary, Application is the application of system design to process data using rules or provisions of certain programming languages. An application is a computer program created to perform and perform the specific tasks of the user. An application is a series of activities or commands to be executed by a computer. Program is a collection of instruction sets that will be executed by the processor, that is in the form of software. How a computer system of thinking is governed by this program.

1.2.2 Android

Android is an operating system for linux-based mobile devices that includes operating systems, middleware, and applications. Android is the operating system for mobile phones based on Linux. Android provides an open platform for developers to create their own apps. It was originally developed by Android Inc, a newcomer company that makes software for mobile phones that was later purchased by Google Inc. For the development, the Open Handset Alliance (OHA), a consortium of 34 hardware, software and telecommunications companies including Google, HTC, Intel, Motorola, Qualcomm, T-Mobile and Nvidia [4].

1.2.3 Google Maps API

Google Maps is a web service-based mapping service provided by Google and is free of charge, which has the capability of many web-based mapping services. Google Maps also has server side properties, ie maps stored on Google servers can be utilized by users. The most popular Google Maps API on the internet. Records made in May 2010 stated that 43% mashups (apps and websites incorporating two or more data sources) use the Google Maps API. Some of the purposes of using the Google Maps API are to view locations, find addresses, get driving directions and more [5].

1.2.4 Web service

Web service is a software system designed to support interaction that can operate machine-to-machine on the network. Web services have interfaces that are described in machine-processable format (specifically WSDL). Other systems are interconnected with Web services in the manner specified by the descriptions using SOAP messages, typically conveyed using HTTP with XML serialization, along with other standards related to the web [6]. To perform its function, the web service requires an agent. Agent is a piece of software or hardware that sends and receives messages. Agents can be written in various programming languages. And can alternate programming languages with the same function [6].

1.2.5 JavaScript Object Notation (JSON)

JSON (JavaScript Object Notation) is a lightweight, readable and written data format for humans, and easily translated and generated by computers. This format is based on part of the JavaScript Programming Language, Standard ECMA-262 3rd Edition - December 1999. JSON is a text format that does not rely on any programming language because it uses the common language styles used by C family programmers including C, C ++, C # , Java, JavaScript, Perl, Python etc. Because of these traits, making JSON ideal as a data-exchange language [8]. JSON is made of two structures:

a. Group name / value pairs. In some languages, this is stated as object, record, structure (struct), dictionary, hash table, keyed list, or associative array.
b. List of ordered values (an ordered list of values). In most languages, this is expressed as array, vector (vector), list (list), or sequence (sequence).

These data structures are referred to as universal data structures. Basically, all programming languages supports this data structure in the same or different form. This is worth mentioning because the data format is easily interchangeable with programming languages that are also based on this data structure. JSON uses the following form: Object is a pair of unreliable names / values. The object starts with {(opening curly brackets) and ends with} (closing braces). Each name is followed by: (colon) and each pair of names / values separated by, (comma).

1. 2.6 Metode Clustering

In statistics, hierarchical grouping is a method of group analysis that seeks to build a group hierarchy. Grouping of agglomerative hierarchies is a hierarchical grouping method with a bottom up approach. The grouping process starts from each one group's data, then seeks the nearest group as a couple to join into a larger group. The process is repeated constantly so that it appears to move upwards to form a hierarchy. This method requires group skewed parameters. The way of agglomerative hierarchy grouping (AHC) is described as follows [7].

1. Calculate proximity maatriks based on the type of distance in use.
2. Repeat steps 3 through 4, until only one group is left
3. Combine the two closest groups based on the specified proximity parameters.
4. Renew the proximity matrix to reflect the proximity between the new group and the original group that has been merged.

tabel 1 1 data first

Data	X	Y
1	1	1
2	4	1
3	1	2
4	3	4
5	5	4

First calculate the Manhattan distance on all pairs of two data. The result is as follows.

Data	1	2	3	4	5
1	0	3	1	5	7
2	3	0	4	4	4
3	1	4	0	4	6
4	5	4	4	0	2
5	7	4	6	2	0

Then the next step treat each data as a group, then we select the distance of two smallest groups. In groups 1 and 3 can be grouped so that the two groups are combined. To proceed to the next level of grouping, the distances between groups (13) with the remaining remaining groups, ie 2.4 and 5, are recalculated by a single link method. The desired distance is as follows.

$d_{(13)2=} min[d_{12,}d_{32}] = min[3,4] = 3$
$d_{(13)4=} min[d_{14,}d_{34}] = min[5,4] = 4$
$d_{(13)5=} min[d_{15,}d_{35}] = min[7,6] = 6$

By deleting rows and columns of the matrix D corresponding to clusters 1 and 3, and adding rows and columns for clusters (13), a new distance matrix is obtained:

Data	(13)	2	4	5
(13)	0	4	4	6
2	3	0	4	4
4	4	4	0	2
5	6	4	2	0

Next, the distance of the two smallest groups is selected. Obtained groups 4 and 5 so that the two groups are combined. To proceed to the next level of grouping, the distances between groups (45) and the remaining remaining groups (13) and 2, are recalculated by a single link method. The distances obtained are:

$d_{(45)13=} min[d_{41,}d_{43,}d_{51,}d_{53}] = min[5,4,7,6] = 4$
$d_{(45)2=} min[d_{42,}d_{52}] = min[4,4] = 4$

By deleting rows and columns of the matrix D corresponding to clusters 4 and 5, and adding rows and columns to clusters (45), a new distance matrix is obtained:

Data	(45)	(13)	2
(45)	0	4	4
(13)	4	0	3
2	4	3	0

Next select the distance of the two smallest groups. Selected groups (13) and 2 so that both groups are combined. To proceed to the next level of grouping, the distances between groups (13) and the remaining 2 groups, ie (45), are recalculated by a single link method. The distances obtain its:

$d_{(123)\ (45)} = min[d_{14},d_{15},d_{24},d_{25},d_{34},d_{35}] = min[5,7,4,4,4,6] = 4$

By deleting rows and columns of the matrix D corresponding to clusters (13) and 2, and adding rows and columns to clusters (123). New matrix distance obtained:

Data	*(123)*	*(45)*
(123)	*0*	*4*
(45)	*4*	*0*

1.2.6 Database

A database is a collection of data that are interconnected with each other, stored on computer hardware and used by software to manipulate it. NoSql is one of those databases where NoSQL is a trend that is evolving today as a manifestation of the need to handle large data and cluster needs. Pramod states that NoSQL is very ill-defined including schemaless data, paths to the cluster, and has the ability to sell traditional consistency for other useful properties. They claim NoSQL can build a more performative system, better scalability and easier to deprogram [9].

1.2.8 MongoDB

MongoDB is one type of NoSql database, which is a non-relational data storage concept. There are four different methods that databases use to store data: key-value, big-table, dockument-oriented and graph. The method used by mongoDB is dockument-oriented. According to Idrees (2012), there are some key features of MongoDB that make it a good choice, as follows: (1) Handling of very large data - Relational database systems start to be too expensive in System resources. Very large data requires more processing and will spend a lot of time as well as place. MongoDB can be a better alternative. (2) Supports asynchronousinsert operations - The workings of MongoDB in the insert process is to insert the document and move on to the next task without waiting for a response from the server. It frees the app to do its work without getting stuck with an old database operation and can improve the user's response. (3) Data processing with MapReduce - MapReduce is an approach to data processing that has two benefits Compared to other traditional solutions, ie better performance and the writing of realcode to process data. Map Reduce also makes aggregate operations and data queries easier [10].

1.2.9 GPS

One of the modern equipment for navigation is Global Positioning Satellite GPS is a device that can know the exact position of the coordinates of the earth that can directly receive signals from satellites. Modern GPS devices use maps to be modern devices in navigation on land, ships at sea, rivers and lakes and airplanes [11]. The GPS function is as follows.

1. *Military. GPS used for war purposes, such as guiding the direction of the bomb, or knowing the position of troops are. In this way we can know which friends the opponent to avoid wrong target, or determine the movement of troops.*
2. *Navigation. Many GPS are also used as navigation tools such as compass. Some types of vehicles have been equipped with GPS for navigation aids, by adding a map, it can be used to guide the rider, so the rider can know which path should be selected to achieve the desired goal.*
3. *Geographic Information System. For the purposes of Geographic Information Systems, GPS is often also included in map making, such as measuring border distance, or as a measurement reference.*
4. *Vehicle tracking system. Another usefulness of GPS is as a vehicle tracker, with t**h**e help of GPS vehicle owners / fleet managers can know any where the vehicle / moving assets are currently.*
5. *Earthquake monitors. Even today, high-precision GPS can be used to monitor the movement of the ground, whose ordinance is only mm in a year. Monitoring of ground movement is useful for estimating the occurrence of earthquakes, either volcanic or tectonic movements [11].*

In this study using GPS technology because GPS can perform calculations and determine the user position and display in maps. GPS can also store the positions of users further GPS can calculate other information, such as speed, direction of destination, route, destination travel and distance of destination. Accurate time calculation greatly determines the user's location information. GPS is also one of the modern fixtures for navigation Because GPS works by relying on satellites, its use is advisable in the open.

1.3.1 Sistem Analisis

System analysis aims to identify the problems that exist in the system and determine the needs of the system built. The analysis includes a running system analysis, system analysis to be built, system

comparison, non-functional requirements analysis and data analysis

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1.3.2 Arsitektur Sistem

System analysis aims to identify the problems that exist in the system and determine the needs of the system built. The analysis includes a running system analysis, system analysis to be built, system comparison, non-functional requirements analysis and data analysis

Website

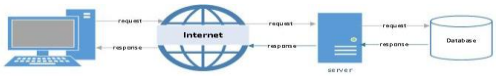


Figure 3. 1 System Architecture On Web Platform

Here is a description of the picture System Architecture on Web Platform:

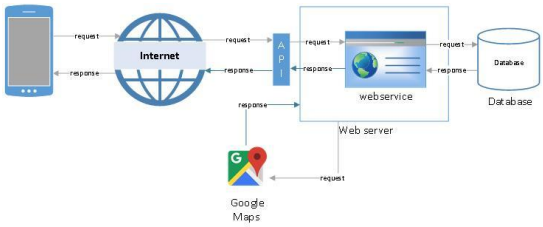
a. *Computer admin to request data to web service on server through internet network*

b. *Server Receive data request and retrieve data from database.*

c. *After receiving data from the database then the data will be sent to the admin computer via the internet network*

d. *If the server receives a data request then the server will retrieve the data in the database*

1. *Mobile*



Gambar 3. 1 Arsitektur Sistem on Platform Android

There are figure of Arsitektur Sistem on Platform Android :

a. *Mobile device users request data to the server via the API.*

b. *The server receives the request data from the server and determines the requested type of request.*

c. *the server receives a location request then the data request will be forwarded to the google place server.*

d. *Jika server menerima permintaan data maka server akan mengambil data yang ada di database.*

1.3.3 Method analysis

tabel 1.2 preliminary data analyst method

Data	*X*	*Y*
1	*-6.895062*	*107.70236*
2	*-6.916495*	*107.67192*
3	*-6.914373*	*107.69802*
4	*-6.917461*	*107.66913*
5	*-6.939420*	*107.75196*

Calculating the distance on all pairs of two data, the result is as follows.

Data	*1*	*2*	*3*	*4*	*5*
1	*0*	*0.24477*	*0.19745*	*0.25722*	*0.49318*
2	*0.24477*	*0*	*0.4732*	***0.1245***	*0.30929*
3	*0.19745*	*0.4732*	*0*	*0.5977*	*0.30441*
4	*0.25722*	***0.1245***	*0.5977*	*0*	*0.30242*
5	*0.49318*	*0.30929*	*0.30441*	*0.30242*	*0*

By treating each data as a group, then select the smallest group spacing so that groups 2 and 4 are selected so that the group is combined. The next step is the distances between groups (2,4) and other groups.

$d_{(2,4)1}=min[d_{21},d_{41}]$ = *min [0.24477,0.25722] = 0.24477*
$d_{(2,4)3}=min[d_{23},d_{43}]$ = *min [0.24477, 0.5977] = 0.5977*
$d_{(2,4)5}=min[d_{25},d_{45}]$ = *min [0.30929, 30242]= 0.30242*

By deleting rows and columns corresponding to groups 2 and 4, adding rows and columns for the group (2,4), the new spacing is as follows:

Data	*(2,4)*	*1*	*3*	*5*
(2,4)	*0*	*0.24477*	*0.5977*	*0.30242*
1	*0.24477*	*0*	*0.19745*	*0.49318*
3	*0.5977*	*0.19745*	*0*	*0.30441*
5	*0.30242*	*0.49318*	*0.30441*	*0*

Next select the distance of the two smallest groups. Groups (2.4) and 3 are obtained so that the groups

are combined. The next step is the distances between groups (2,4,3) and other groups.

$d_{(2,4,3)1}=min[d_{21},d_{41},d_{31}]$ = *min [0.24477, 0.25722, 0,19745] = 0.19745*
$d_{(2,4,3)5}=min[d_{25},d_{45},d_{35}]$ = *min [0.30929, 30242,0.30441] = 0.30242*
By deleting rows and columns corresponding to clusters 2, 4 and 3, adding rows and columns for the group (2,4,3) obtained a new distance as follows: '

Data	*(2,4,3)*	*1*	*5*
(2,4,3)	*0*	*0.19745*	*0.30242*
1	*0.19745*	*0*	*0.49318*
5	*0.30242*	*0.49318*	*0*

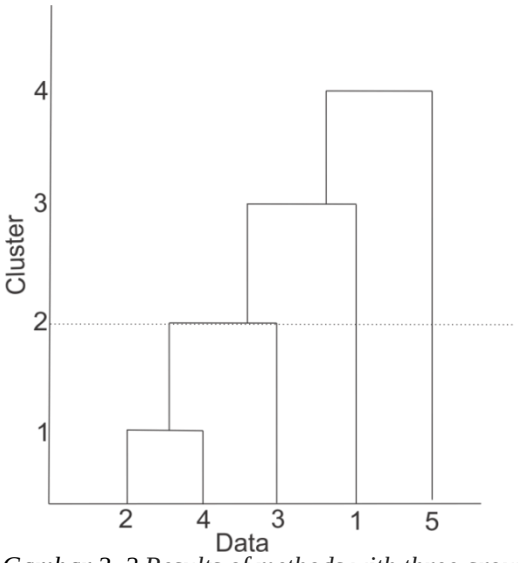
Next select the distance of the two smallest groups. There are groups (2,4,3) and1 so that this group is combined. The next step is the distances between groups (2,4,3,1) and other groups.

$d_{(2,4,3,1)5}=min[d_{25},d_{45},d_{35},\ d_{15}]$ = *min [0.30929, 30242,0.30441, 0.49318] = 0.30242*

By deleting rows and columns corresponding to groups 2, 4, 3 and 1 adding rows and columns for the group (2,4,3,1) obtained a new distance is as follows:

Data	(2,4,3,1)	5
(2,4,3,1)	0	0.30242
5	0.30242	0

Thus, groups (2,4,3,1) and 5 are combined to form a single group of five data when the closest distance reaches 0.30242. If eg want the data divided into three clusters then the resulting clusters are (2,4,3), 1 and 5



Gambar 3. 2 Results of methods with three groups

1.3.4 analisis kebutuhan peerangkat lunak

Tabel 3. 1 Functional requirements

Kode SKPL	***Spesifikasi Kebutuhan Perangkat Lunak Fungsional***
SKPL-F-001	*Sub sistem website have fitur login for admin.*
SKPL-F-002	*Sub sistem mobile have fitur login for sales*
SKPL-F-003	*Sub sistem mobile have fitur lihat kunjigan*
SKPL-F-004	*Sub sistem mobile have have fitur menambah data pemesanan*
SKPL-F-005	*Sub sistem mobile have fitur add data pembayaran*
SKPL-F-006	*Sub sistem mobile have fitur logout*
SKPL-F-007	*Sub sistem website have fitur manambah data sales*
SKPL-F-008	*Sub sistem website have fitur "menambah data produk"*
SKPL-F-009	*Sub sistem website dapat menyediakan fitur melihat data sales*
SKPL-F-010	*Sub sistem website have fitur "melihat data produk"*
SKPL-F-011	*Sub sistem website have itur menonaktifkan sales*
SKPL-F-012	*Sub sistem website have fitur menonatifkan produk*
SKPL-F-013	*Sub sistem website have fitur culustring outlet*
SKPL-F-014	*Sub sistem website have fitur melihat data outlet*
SKPL-F-015	*Sub sistem website have fitur menambah data outlet*
SKPL-F-016	*Sub sistem website have fitur menonaktifkan outlet*
SKPL-F-017	*Sub sistem website have fitur meubah data produk*

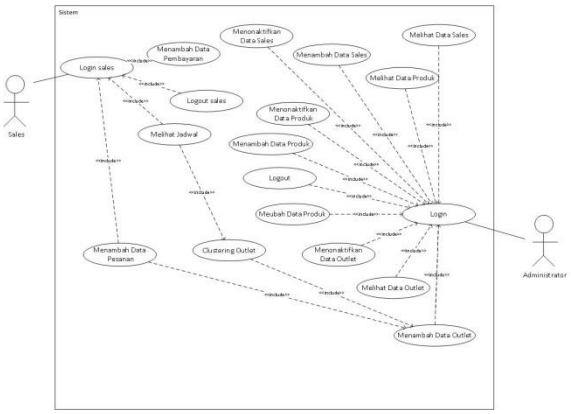
SKPL-F-018	*Sub sistem website have fitur logout*

1.3.6 Requirements analysis software

No	*Requirements analysis software*
1	*Sistem Operasi Windows 10 Home*
2	*Integrated development environment (IDE) Android Studio 2.2.1.*
3	*Java Runtime Environment (JRE) 1.8.*
4	*Java Development Kit 1.8.*
5	*Android SDK API (versi 5.1 Lollipop)*
6	*Android Development Tool 25.2.2*
7	*Text editor.*
8	*Web Browser*

1.3.7 Usecase diagram

Use case diagram is used to describe the relationship between actors with activities on the system. Use case diagrams describe what processes occur in the system and how they relate to actors. Use case diagram in this application can be seen in the following figure:



Gambar 3. 3 usecase diagram

2. CLOSING

From the results of testing the previous interviews to the company with the peratanyaan "According to you, whether this application can help the company to monitor sales during a visit"? And get the answer as follows: "This application is quite helpful to monitor sales during the visit." Can be concluded with the construction of smart sales applications for sales visit makes it easy for companies to monitor the activities kunjugan undertaken, where when sales make visits, data directly sent To the app used by the admin. In testing by doing interviews that have been done previously obtained that smart sales applications can facilitate companies in monitoring sales visits. The suggestion for this research is In building smart sales application for kunjugnan sales at PT. Tumbakmas Niaga Sakti has to facilitate the visits conducted by the sales therefore this apliksai need dikmbangkan future. Therefore it is given suggestions that can be used as a reference for the development of this application for the future by utilizing technology that continues to grow so that the application follows the development of technology

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DAFTAR PUSTAKA

[1]Sedarmayanti dan Syarifudin Hidayat, "Metodologi Penelitian", Bandung: Mandar Maju, 2011.

[2] AtmodjoEvangelista Giovanni**,**Mahestu N. Krisjant "*Preferensi Konsumen Terhadap Merek Smartphone Berdasarkan Sistem Operasi",* Universitas Atma Jaya, Jogjakarta, 2013.

[3] Jauha J. H.M, *Analisis dan Disain Sistem Informasi, Yogyakarta: Andi, 2001.*

[4] *Safaat H, Nazruddin. Pemrograman Aplikasi Mobile Smartphone dan Tablet PC Berbasis Android. 2011 : Informatika Bandung*. Cari perpus

[5] Mustofa. Khabib , Adi Nugroho," *INTEGRASI DATA SPASIAL MENGGUNAKAN TEKNOLOGI JAVA RESTFUL WEB SERVICES (JAX-RS) UNTUK PENGEMBANGAN APLIKASI SISTEM INFORMASI GEOGRAFIS DENGAN SISTEM BASIS DATA RELASIONAL MAJEMUK*",

Universitas Gadjah Mada, Jogjakarta,vol.8,No.2,2012.

[6] Rahman Hakim Arief, "*Perancangan dan Implementasi RESTful Web Service untuk Game Sosial Food Merchant Saga pada Perangkat Android",* ITS, Teknik Informatika, Surabaya,vol.2,no.1, 2013.

[7] Prasetyo Eko "*DATA MINING Konsep dan Aplikasi Menggunakan MATLAB*" , Yogyakarta , Andi, 2012

[8] Json.org, "Pengenalan JSON", [Online], Available :http://www.json.org/json-id.html. [diakses pada 2 April 2017].

[9] EmanuelWahju Rahardjo Andi, Jimmy Sentosa, *"Perbandingan Kinerja Data Manipulation Language MongoDB dan SQL Server",* Maranatha, Bandung, 2013.

[10]Tunardi Yovita, Rita Layona,*" NOSQL TECHNOLOGY IN ANDROID BASED MOBILE CHAT APPLICATION USING MONGODB*", Binus University,Jakarta Barat, Vol.5,no.2,2014.

[11] Purnama Eka Bambang "*Pemanfaatan Global Positioning System Untuk Pelacakan Objek Bergerak*", Universitas Surakarta, vol.2, no.2 2009