

---

## Application of Clustering Method For Customer Royal Data Grouping at CV. Garuda Mas Motor Binjai

Putri Ladya Elvanny<sup>1\*)</sup>, Budi Serasi Ginting<sup>2)</sup>, Yani Maulita<sup>3)</sup>  
<sup>1,2,3)</sup> STMIK Kaputama Binjai, Indonesia

\*Corresponding Author  
Email : [yvany853@gmail.com](mailto:yvany853@gmail.com)

---

### Abstract

Communication is a very important activity. Communication is carried out with the aim of exchanging information between several individuals. Communication can be done in various ways. Those who wish to communicate with each other can meet in person or through intermediaries. There are several types of media that function as intermediaries of information. You can use several media such as print media, electronic media, and online media to get various information. Digital communication in the modern era is not far from the Internet because almost all digital communication tools use the Internet. Internet needs vary greatly from old to young, because Internet needs are different, connection management is needed (Management Bandwidth) so that client requests with high connections do not interfere with clients with relatively low connection requests. One of the tools commonly used for connection management is MikroTik with the Peer Connection Queue (PCQ) feature. The reason for choosing Mikrotik is because Mikrotik has complete features at an affordable price. The importance of connection management is to maximize the connection provided by the ISP so that clients can use the Internet without buffering.

**Keywords:** Royal Customer, Data Mining, K-Means, Clustering, Reward

---

## INTRODUCTION

CV. Garuda Mas Motor is one of the businesses engaged in the sale of Honda motorcycles in Binjai City. Of course CV. Garuda Mas Motor has many customers who buy motorbikes, both in cash and on credit. The number of requests and sales that occur, this makes motorcycle sales data continue to grow every month, these data are recorded in a document and inputted into Microsoft excel as data storage.

From the sales data, CV. Garuda Mas Motor strives to give royalty or awards to customers. This is of course a CV. Garuda Mas Motor has difficulty selecting and sorting customers with large piles of data. So it is necessary to build a system that can classify sales data for motor vehicle sales to obtain new information that can be used as material or the basis for making a decision. There are many methods used in grouping data, one of which is data mining techniques.

Data mining can help companies explore new knowledge by processing existing data with clustering methods and using the K-Means algorithm. From the customer data, several criteria/variables will be taken, including purchases, expenses and programs. The data is processed with the Matlab program to produce a cluster center and the relationship between variables is obtained from the group with the highest value.

## RESEARCH METHODS

### 1. Data Mining

According to (Prasetyowati, 2017) Data mining is one of the main parts or processes and

Knowledge Discovery in Database (KDD) whose form of activity is collecting and using past data to find regularities, patterns or relationships in a larger data set. Broadly speaking, KDD includes three stages, namely preprocessing, process (data mining) and post processing. In conclusion, data mining is the process of discovering certain patterns and a large data or database to obtain very useful information.

According to Prasetyo (2012, p. 2) states that "Data mining is a process to obtain useful information from large database warehouses". In general, the definition of data mining can be interpreted as follows:

1. The process of finding interesting patterns from large amounts of stored data.
2. Extraction of useful or interesting information (non-trivial, implicit, previously unknown potential use) patterns or knowledge of data stored in large quantities.
3. Exploration of automatic or semi-automatic analysis of large amounts of data in search of meaningful patterns and rules.

## 2. Data Mining as a Process in Knowledge Discovery In Data

The process/steps in KDD Data Mining are as follows:

1. Data Selection  
Creating a target data set, selecting a data set, or focusing on a subset of variables or data samples, where discovery will be made. Selection (selection) of data from a set of operational data needs to be done before the stage of extracting information in KDD begins.
2. Pre-processing/Cleaning  
Pre-processing and data cleaning are basic operations as noise removal is performed. Before the data mining process can be carried out, it is necessary to carry out a cleaning process on the data that is the focus of KDD.
3. Transformation  
The search for useful features for presenting data depends on the goals to be achieved
4. Data Mining  
The Data Mining process is the process of looking for interesting patterns or in selected data using certain techniques or methods.
5. Interpretation Evaluation

The pattern of information generated from the data mining process needs to be displayed in a form that is easily understood by interested parties.

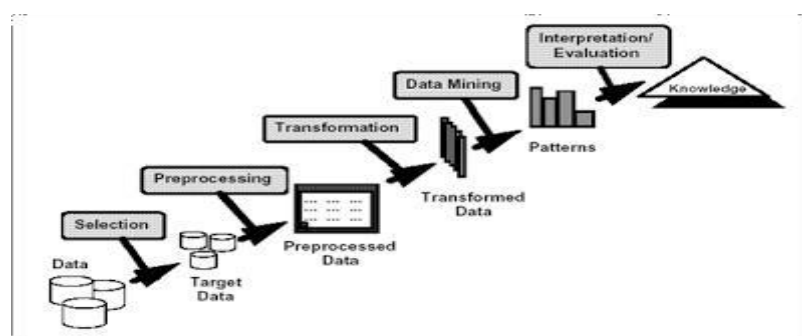


Figure.1 KDD Data Mining Process

### **3. Clustering Method**

Clustering is a method of analyzing data, which is often included as a data mining method, whose goal is to group data with the same characteristics.

Clustering analysis (clustering) is to find objects in one group that are the same (relationship) with others and are located (points have a relationship) with objects in other groups.

### **4. K-Means . Algorithm**

According to (Prasetyo, 2012) states that K-Means is a non-hierarchical grouping method that tries to partition data into clusters/groups so that data that has the same characteristics will be included in the same cluster and data that has the same characteristics. different groups are grouped into other groups.

### **5. Definition of Flowchart**

According to Indra Yantini B (2010, p.29) Flowchart is a graphical representation and steps that must be followed in solving a problem consisting of a set of symbols, where each symbol represents a particular activity. Flowcharts help analysts and programmers to break down problems into smaller segments and help analyze alternatives in operation.

### **6. Understanding UML (Unified Modeling Language)**

According to Sugiarti (2013, p.34) "UML (Unified Modeling Language) is a language that has become the standard in the visualization industry, designing and documenting software systems." UML offers a standard for designing a system model.

The steps for using the Unified Modeling Language (UML) are as follows:

1. Make a list of Business Processes from the highest level to define the activities and processes that may arise.
2. Make a rough deployment diagram to define the physical architecture of the system.
3. Define other non-functional requirements, security and so on that must also be provided by the system.

### **7. Understanding Matlab**

According to Away (2014, p. 129) Matlab is a programming language as a form of media for interaction between humans and computers, nowadays it is made easier and faster.

Matlab was developed as a programming language as well as a visualization tool, which offers many capabilities to solve various cases that are directly related to mathematical scientific disciplines, such as engineering, physics, statistics, computing and modeling.

## **RESULTS AND DISCUSSION**

### **A. Discussion**

In designing the system, the author builds a system that has been done manually into a computerized system, namely the application of the clustering method for grouping royal customer data in CV. Garuda Mas Motor Binjai.

#### **1. Main Menu**

The main menu of this program consists of several menus, namely cluster, cluster results, information, help and exit. The main menu display as shown in Figure IV. below this.



Figure. 4 Main Menu

## 2. Menu Clustering

The cluster menu contains orders and processes for the royal customer cluster, the cluster results menu displays the results of the cluster process on the cluster menu. The cluster menu has two function buttons as follows.

- a. Import Data Button
- b. Cluster Process Button

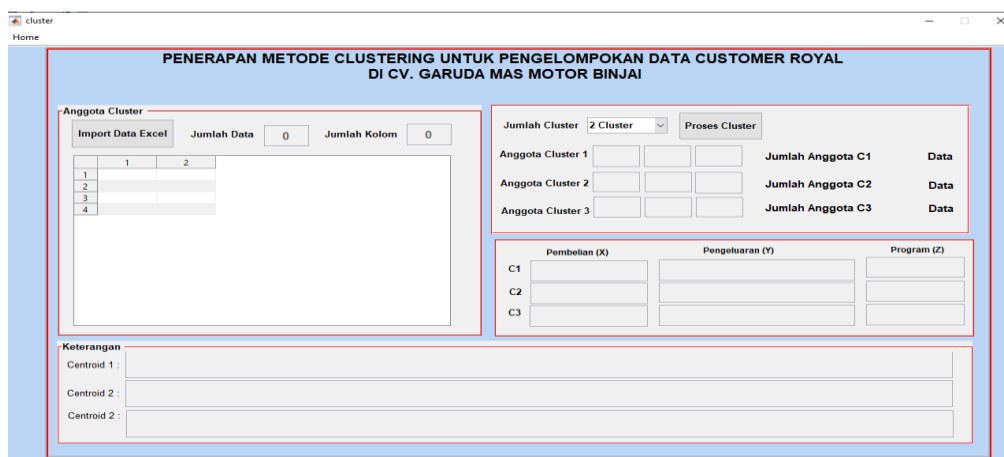


Figure. 5 Display Cluster Menu

### 3. Cluster Results

The cluster results menu is used to display the cluster result process that has been carried out on the cluster menu.

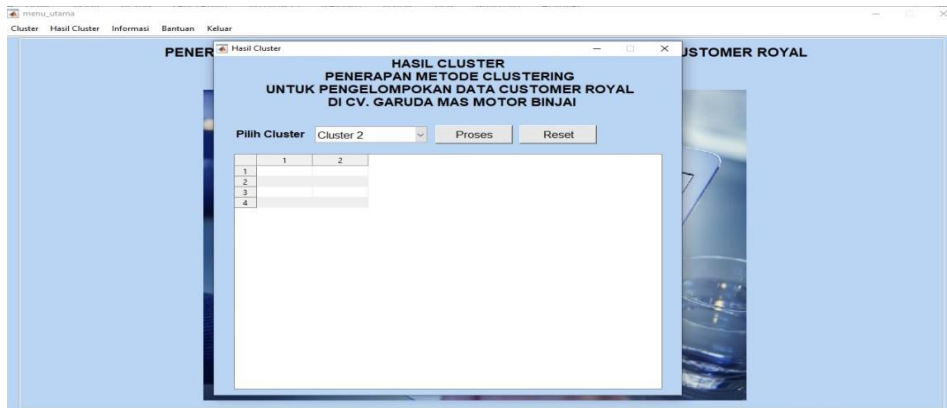


Figure. 6 Cluster Menu Display

### 4. Information

The information menu is used to display the amount of data in the customer royal data mining grouping process.

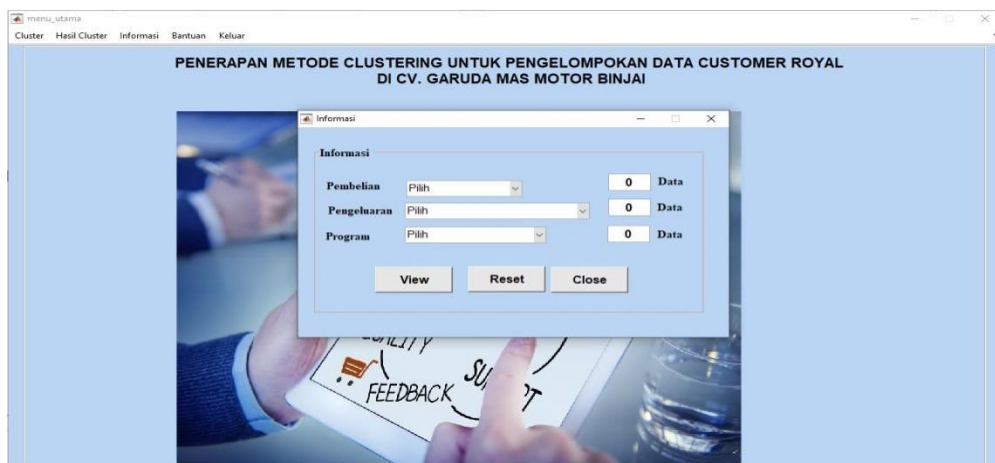


Figure. 7 Information Display

## 5. Help

The help menu is used to display information about how to use a data mining system to group customer royal data using the clustering method.

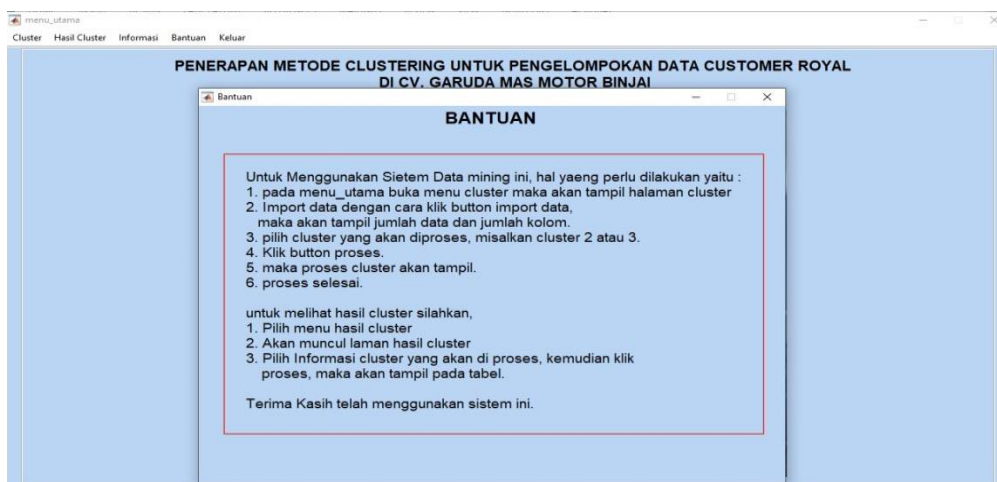


Figure. 8 Help Menu

## B. Implementasi

Implementation has the aim of preparing all system implementation activities according to a predetermined design.

### 1. Process Result Cluster 2

The following is the result of the system process that has been carried out as shown in the image below:

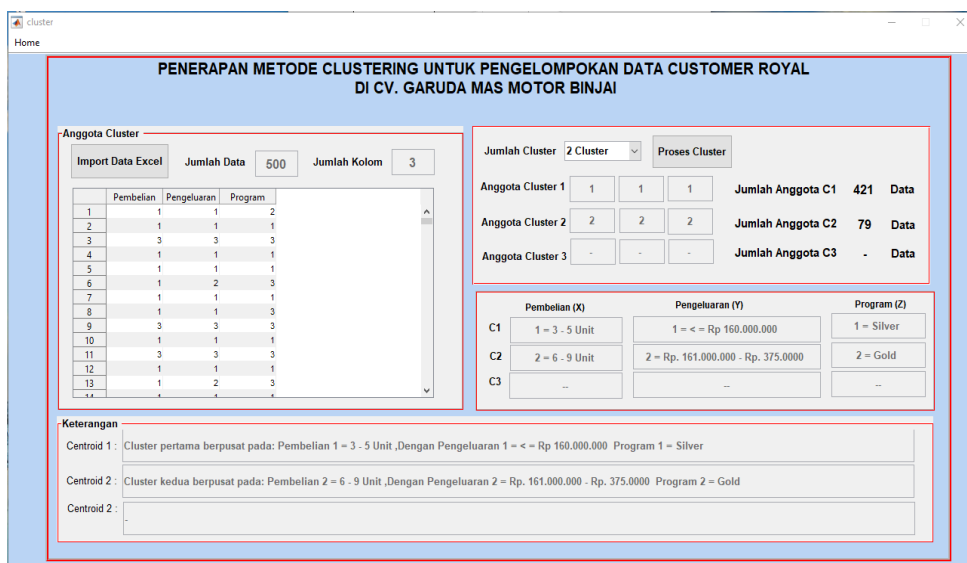
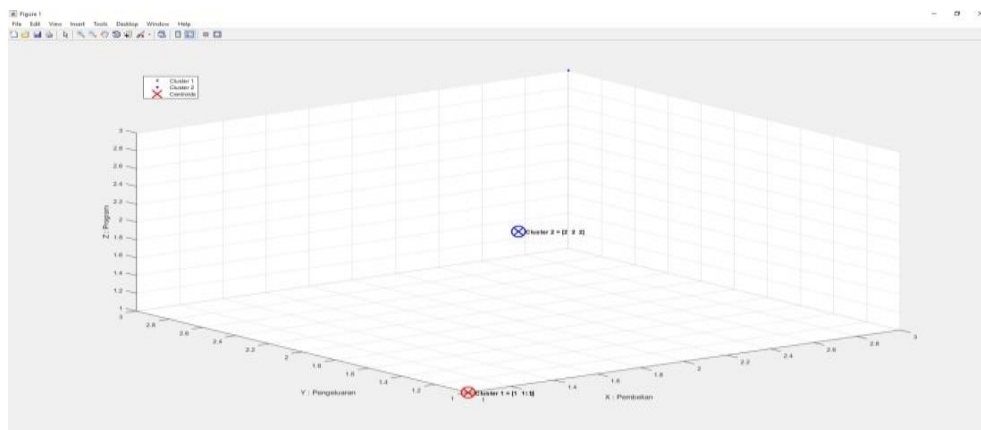


Figure. 9 Process Cluster 2

- From the results above, each group can be summed as follows:
1. Group 1 A total of 421 data with cluster members (C1) : 1 1 1
  2. Group 2 A total of 79 data with cluster members (C2): 2 2 2

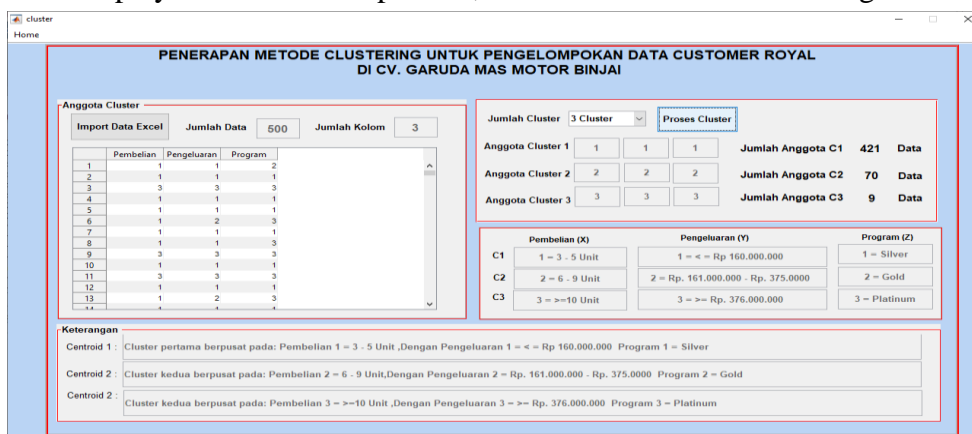
The results of the 3 cluster graph can be seen in the image below:

**Figure. 10 Graph Cluster 2**



**2. Process result cluster 3**

as for the display of the cluster 3 process, which is as shown in the image below.

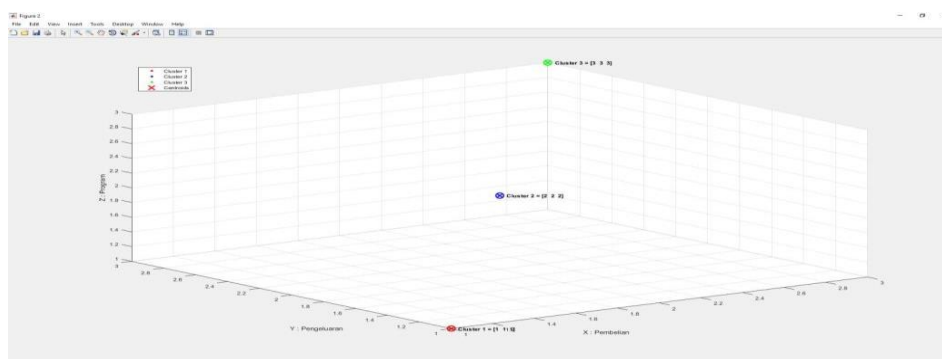


**Figure. 11 Process Cluster 3**

From the results above, each group can be summed as follows:

1. Group 1 A total of 421 data
  2. Group 2 A total of 70 data
  3. Group 3 A total of 9
- Data Total data = 500 data

The results of the 3 cluster graph can be seen in the image below:



**Figure. 12 Graph Cluster 3**

## CONCLUSION

From the results of the analysis based on the clustering of customer royal data, a conclusion can be drawn, from the 500 data, there are 3 clusters which are grouped as follows:

1. Based on customer royal criteria data, such as purchases, expenses and programs, they can be grouped using the clustering method.
2. With customer royal data, you can build data mining applications using the clustering method that can group customer royal data and produce customer royal data groupings that can be used as a reference in determining reward giving to customers.

Based on the analysis that has been done on the royal customer data grouping using the clustering method, it is necessary to do the cluster process several times to get the same results according to the first process. From the results of the cluster above, the results of the cluster 2 and 3 processes are obtained, which have the same results in C1 and C2, with the results of C1 being centered on the centroid with the purchasing group (X) i.e. 3-5 units with expenditure (Y)  $\leq$  Rp 165,000,000 with program (Z) Silver. C2 is centered on the centroid with a purchasing group (X) of 6 – 9 units, with expenses (Y) ie Rp 161,000,000 - Rp 375,000,000,-, with program (Z) namely Gold. C3 centered on the centroid with purchasing group (X) ie  $\geq$  10 units, with program (Z) namely Gold. expenditure (Y) is  $\geq$  IDR 376,000,000, with program (Z) namely Platinum.

## REFERENCES

- G. A. Away, The Shortcut of MATLAB Programming. Bandung. Informatics, 2014
- Indra Yatini, Flowchart, Algorithm and Programming using C++ Builder Language. Yogyakarta: Graha Ilmu, 2010.
- Prasetyowati, Data Mining Information and Evaluation Data Grouping. Pemekasan: (M. Afandi (ed.)). Media Ambassador, 2017.
- Prasetyo, Data Mining: Concepts and Applications using MATLAB. Yogyakarta: CV. Andi Offset, 2012.



Sugiarti, Analysis and Design of UML (United Modeling Language) Generated VB.6. Yogyakarta: Graha Ilmu, 2013.