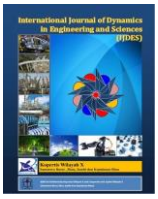
INTERNATIONAL JOURNAL of DYNAMICS in ENGINEERING and SCIENCES (IJDES)
LLDIKTI WILAYAH X
Vol. 8, No. 2, Oct 2023
e-ISSN: 2502-0692



CUSTOMER CLUSTERIZATION AS A SUPPORT OF CUSTOMER RELATIONSHIP MANAGEMENT AT PT. SIP (PRIME INSTALLATION CERTIFICATION) WITH K-MEDOIDS ALGORITHM

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Article Information

Submitted :
02 Agust 2023

Accepted :
20 Sept 2023
Published :
01 Oct 2023

Abstract

This thesis aims to investigate the implementation of customer clustering techniques as a crucial component in developing Customer Relationship Management (CRM) strategies at PT. SIP (Sertifikasi Instalasi Prima). CRM is a highly important approach in managing customer relationships, and customer clustering can aid in understanding different customer behavior patterns. In this study, the K-Medoids algorithm is employed to group customers based on their characteristics and purchasing patterns. The research methodology involves collecting customer data from PT. SIP and processing the data for clustering analysis preparation. The subsequent steps involve applying the K-Medoids algorithm to form homogeneous customer clusters. The clustering results are integrated into the existing CRM strategy, enabling PT. SIP to provide services more effectively tailored to the needs and preferences of each customer group. The findings of this study offer valuable insights into various customer purchasing patterns and preferences. The clustering outcomes assist in identifying the most valuable and potential customer groups, providing a better understanding of how PT. SIP can enhance their interactions and services. By incorporating clustering approaches into the CRM strategy, the company can improve customer retention, enhance customer satisfaction, and optimize overall customer value.

Keywords: Nuts , K-Means Clustering, Shape and Texture.

1. Introduction

Along with today's technological advances, humans live in a comfortable and practical atmosphere. This is made possible by the presence of electrical energy. With electrical energy, various types of electrical equipment can be converted into rotary energy, heat, light, and audio-video signals, as needed [1]. At the present time, the development of information technology is increasingly penetrating various business applications, CRM is one of the interesting business processes to be discussed. PT.SIP as a company engaged in electrical contractors and general trading, has skilled and experienced experts in electrical and mechanical matters, who have been recognized by customers who have used our services as electrical contractors and general trading. CRM is useful for increasing revenue from customer satisfaction. This stems from the company's promise to understand what and how customers want to interact, all of this is shown to achieve customer loyalty and a profitable environment. This is because not all customers are created equal [2]. Customer Relationship Management is one of the things needed by a company. The definition of Customer Relationship Management (CRM) is a corporate-level strategy, which focuses on building the application of Customer Relationship Management strategies can be developed to acquire new customers (acquire), improve relationships with customers (enhance), and retain customers (retain) which leads to the creation of customer loyalty [3]. Customer Relationship Management (CRM) is a strategic choice of PT Phapros to support long-term business strategies and bring benefits to certain customers. Customer data and information

technology support every CRM strategy [4]. In this research, data mining is very important for the process of extracting data to find important patterns that can be useful information and grouping the data we take. Data Mining is a process that uses statistical techniques, calculations, artificial intelligence, and machine learning to extract and identify useful information and related knowledge from databases, different big data [4]. The k-medoids method is a clustering method that functions to break data sets into groups. The advantages of this method are able to overcome the weaknesses of the k-means method which is sensitive to outliers. Another advantage of this method is that the results of the clustering process do not depend on the order in which the data sets are entered. K-Medoids is an algorithm used to find medoids in a group (cluster) which is the center point of a group (cluster). The K-Medoids algorithm is better than K-Means because in K-Medoids we find k as representative objects to minimize the number of dissimilarities of data objects, while in K-Means using the number of euclidean distances for data objects.

Steps of the K- Medoids algorithm:
a. Initialize k cluster centers (number of clusters).
b. Allocate each data (object) to the nearest cluster using the Euclidian Distance size equation with the equation.
c. Randomly select objects in each cluster as new medoid candidates.
d. Calculate the distance of each object in each cluster with the new medoid candidate.
e. Calculate the total deviation (S) by calculating the value of the new total distance - total old distance. If S < 0, then swap the object with data clusters to form a new set of k objects as medoids.

2. Research of Methodology

Problem identification is carried out by approaching the object of research. The purpose of this stage is to find out the problems that occur precisely, so that it is hoped that the research can provide the most optimal solution to solving these problems. Data collection is done by studying books and journals related to the research. This stage aims to identify the problems that exist in the system and determine the system requirements for the system being built.

This stage is carried out after collecting data and information that has been taken through direct interviews, this data analysis stage is a process for processing data that is used as a sample. The data obtained is in the form of an Excel file. And at this stage data cleaning is also carried out by correcting data that is not formatted in excel.

At the process analysis stage, the author uses the K- Medoids clustering method, where this method is used to see and improve customer satisfaction and increase sales in marketing strategies.

3. RESULT

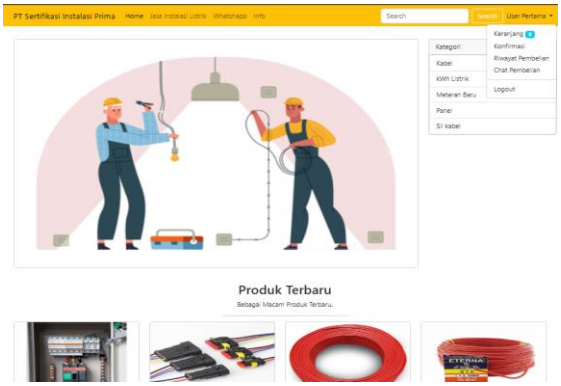

Figure 1. Login Customer

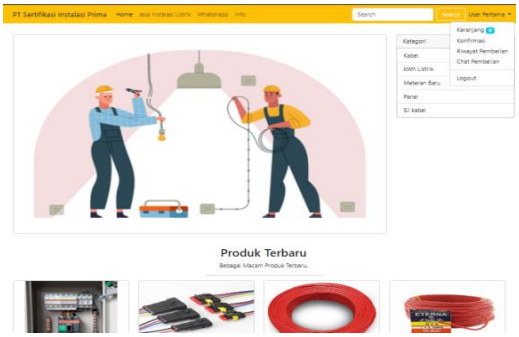

Figure 2. Homepage Design

Overall, the use of CRM with the K-medoids algorithm helps PT SIP in optimizing marketing strategies, increasing customer convenience through a web-based platform, and creating customer satisfaction through incentivizing potential customers.

The design process has 2 methods, namely designing models and designing interfaces. The design of the model focuses on the design of the Unified Modeling Langueage (UML) which will be applied to the website, the interface design focuses on the appearance of the page intended for customers, admins and technicians.

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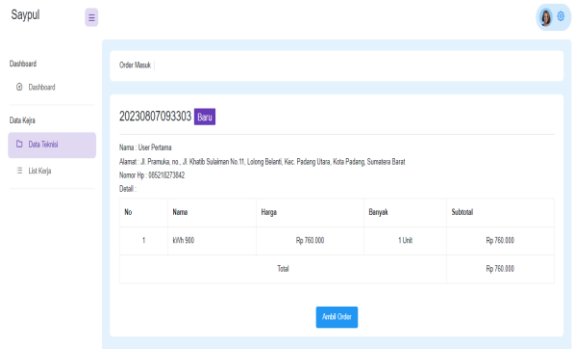

Figure 3. Incoming Orders for Technicians

4. CONCLUSION

Overall, the use of CRM with the K-medoids algorithm helps PT SIP in optimizing marketing strategies, increasing customer convenience through a web-based platform, and creating customer satisfaction through incentivizing potential customers.

References

[1] Syahrul dkk. (2004). Teknologi informasi dan pendidikan. *Al-Manar (Edisi 1)*, *12*(2), 1–7. https://doi.org/10.31294/bi.v7i1.5790

[2] Firdaus, S. (2020). *Strategi Promosi Pada Sistem Informasi Crm Di Pt. Sentrad Naluri Kreasi* (Doctoral dissertation, Universitas Komputer Indonesia). https://elibrary.unikom.ac.id/id/eprint/2874/

[3] Noor, S. M. M. M. (2010). Pengembangan Customer Relationship Management Berbasis SIStem E-Commerce Ruang Lingkup Identifikasi Masalah. *CommIT*, *4*(2), 139–149.

[4] Ramadhan, D. G., Prihatini, I., & Liantoni, F. (2021). Analisis Clustering Pengelompokan Penjualan Paket Data Menggunakan Metode K-Means. *Ultimatics: Jurnal Teknik Informatika*, *13*(1), 33-38. https://ejournals.umn.ac.id/index.php/TI/article/view/1981

[5] moh.aslan shaah putra. (2020). PENERAPAN ALGORITMA FUZZY C-MEANS MENGGUNAKAN MODEL RFM DALAM KLASTERISASI PELANGGAN. 6(1), 64–69.http://dx.doi.org/10.24014/rmsi.v6i1.8646

[6] Agustini. L , Sumarno , Okta Kirana. I (2022) *Pengelompokan Data Janjang Panen Kelapa Sawit Menggunakan Algoritma K-Medoids Pada PT SIR MANDAU* Journal of Machine Learning and Data Analytics (MALDA) Volume 01, No. 01, Januari 2022 Page: 36-44 https://journal.fkpt.org/index.php/malda/article/view/164

[7] Syabania, Rahma, Rosmawarni, Neny. (2021). *PERANCANGAN APLIKASI CUSTOMER RELATIONSHIP MANAGEMENT (CRM) PADA PENJUALAN BARANG PRE-ORDER BERBASIS WEBSITE*. Jurnal Rekayasa Informasi, Vol. 10 No.1 April 2021 https://ejournal.istn.ac.id/index.php/rekayasainformasi/article/view/951/*Segmentation in Images Using Extraction of Color and Texture Features* .

[8] Syarifuddin , F., Misdram , M., & Aris Widodo, A. (2020). Classification of Corona Virus Data Sets Using the Naïve Bayes Classifier Method. In *November* (Vol. 12, Issue 2).