INTISARI

VISUALISASI SEGMENTASI PELANGGAN BERDASARKAN ATRIBUT RFM MENGGUNAKAN ALGORITMA K-MEANS UNTUK MEMAHAMI KARAKTERISTIK PELANGGAN PADA TOKO RETAIL ONLINE

Meningkatnya minat belanja pelanggan toko retail online menimbulkan persaingan ketat antar *retailer*. Agar tetap unggul dan kompetitif, *retailer* perlu memahami karakteristik pelanggannya. Penerapan segmentasi pelanggan memberikan kemudahan pada *retailer* untuk memahami karakteristik pelanggan berdasarkan penilaian pada atribut yang dihitung dari data riwayat transaksi pelanggan. Penelitian ini menelusuri karakteristik pelanggan berdasarkan penilaian pada atribut RFM (*recency, frequency,* dan *monetary*). Data tersebut akan dikelompokan dengan metode *clustering* menggunakan algoritma *k-means.* Performa algortima *k-means* akan dinilai melalui perbandingan dengan algoritma *k-medoids* berdasarkan *cluster validation metrics* nilai *silhouette*, *Calinski-Harabasz Index*, dan *DaviesBouldin Index.* Berdasarkan metrik tersebut, didapatkan nilai algoritma *k-means* berturut-turut adalah 0,6558, 0,7219, dan 3578,9, sedangkan nilai algoritma *k-medoids* adalah 0,4677, 0,8298, dan 1236,9. Melalui penilaian tersebut didapatkan performa *clustering* dengan *k-means* lebih unggul. *Cluster* yang dibentuk oleh algoritma *k-means* akan memanfaatkan *elbow method* sehingga mendapatkan jumlah optimal tiga. Ketiga *cluster* tersebut akan dianalisis atribut RFM-nya, sehingga membentuk segmentasi bernama *uncertain, valuable customer,* dan *first timers*. Visualisasi hasil analisis segmentasi pelanggan yang diperlukan untuk mendeskripsikan karakteristik pelanggan sehingga dapat menunjang *retailer* dalam pengambilan keputusan, di dalamnya terdapat empat halaman *dashboard* pada *looker studio*. Masing-masing halaman tersebut akan menampilkan analisis toko *retail online,* analisis pelanggan, analisis segmentasi, dan *top chart. Dashboard* visualisasi tersebut diuji fungsionalitasnya dan kelayakannya dengan metode pengujian *blackbox* testing dan berhasil menyelesaikan semua skenario pengujian, kemudian dilakukan pengujian dengan metode UAT dan mendapatkan predikat sangat layak.

Kata kunci : Visualisasi Data, Segmentasi Pelanggan, *K-means*, Atribut RFM, *Retail Online*

ABSTRACT

VISUALIZATION OF CUSTOMER SEGMENTATION BASED ON RFM ATTRIBUTES USING K-MEANS ALGORITHM TO COMPREHEND CUSTOMER CHARACTERISTICS WITHIN AN ONLINE RETAIL STORE

The growing interest in online retail shopping among customers has resulted in intense competition among retailers. To sustain a competitiveness, retailers need to understand characteristics of their customer. Implementation of customer segmentation facilitates retailers in understanding customer characteristics through assessments based on attributes derived from customer transaction history data. This research explores customer characteristics based on RFM (recency, frequency, and monetary) attributes. Data will be clustered using k-means algorithm, and its performance will be evaluated by comparing it with k-medoids algorithm using cluster validation metrics such as silhouette score, Calinski-Harabasz Index, and DaviesBouldin Index. Based on given metrics, the consecutive performance values for k-means algorithm are 0.6558, 0.7219, and 3578.9, while the performance values for k-medoids algorithm are 0.4677, 0.8298, and 1236.9. Thus, it is examined that the clustering performance with the k-means algorithm is superior. Cluster's formed by k-means algorithm will utilize elbow method to determine an optimal number of cluster, specifically three in this instance. These three clusters will be analysed based on their RFM attributes, resulting in the formation of segmentation named as uncertain, valuable customers, and first-timers. Visualization of customer segmentation analysis results is imperative for elucidating customer characteristics and support retailers in decision-making. This includes the utilization of four dashboard pages within Looker Studio, with each page will display analyses of the online retail store, customer analytics, segmentation analysis, and top charts. The visualization dashboard was tested for its functionality and feasibility using the blackbox testing method and successfully completed all testing scenarios. Subsequently, conducted testing to the dashboard using UAT method and received a very accepted rating.

Keywords : Data Visualization, Customer Segmentation, K-means, RFM Attributes, Online Retail