

ABSTRACT

Suboptimal medicine stock management at Apotek Talun Farma has led to inventory imbalances, specifically overstock and stockouts, which affect operational efficiency and revenue. To support data-driven decision-making, this study implements the K-Means Clustering method to group medicines based on sales volume, price, and medicine type. Data collection was conducted through observations and interviews, utilizing one year of sales transaction data as the basis for analysis. The data processing follows the CRISP-DM (Cross-Industry Standard Process for Data Mining) framework, encompassing business understanding, data understanding, data preparation, modeling, evaluation, and deployment. The optimal number of clusters was determined using the Elbow Method, while the model quality was evaluated by comparing two distance metrics within the Davies-Bouldin Index (DBI). The test results indicate that the Manhattan distance calculation yielded the lowest DBI value of 0.3823, signifying that this method effectively separates clusters and provides more optimal results compared to the Euclidean method. The clustering process identified three distinct groups of medicines characterized by high, medium, and low sales and price patterns. All analytical results are visualized through an interactive Streamlit-based dashboard, featuring data upload, variable selection, cluster determination, SSE value tables, 3D visualizations, cluster distribution, cluster details, and report download options. This visualization assists users in understanding medicine sales patterns more clearly and deeply. The findings of this research are expected to serve as a strategic reference for Apotek Talun Farma in managing inventory more accurately, minimizing the risk of stock imbalances, and enhancing the effectiveness of decision-making in medicine procurement strategies.

Keywords: *K-Means Clustering Algorithm, Pharmacy, Data Mining, Medicine Sales, Streamlit*