

## ABSTRACT

Social media platform X serves as a space for users to share experiences and engage in discussions. Interactions on social media shape public opinion, influence consumption patterns, and impact purchase intentions, including in the beauty industry. Analyzing the structure of communities on social media X related to skincare trends is essential to identify interconnected user groups. Various methods have been developed for community detection in social network analysis. The Girvan-Newman algorithm removes edges with the highest betweenness to divide communities but is inefficient for large networks. Meanwhile, the Clauset-Newman-Moore (CNM) algorithm improves efficiency through a Greedy approach based on modularity but tends to produce suboptimal solutions. This study implements the Louvain algorithm, which offers high efficiency with modularity optimization and is more effective for handling large networks as it does not require the number of communities as an initial parameter. The Louvain algorithm detects large communities based on user interactions using the hashtag 'skincare' through a directed and weighted graph, where nodes represent users and edges represent relationships between users via mentions. The DBSCAN algorithm then clusters these large communities into smaller clusters based on density. This study uses social media X posts obtained through web scraping, followed by pre-processing to clean the data. The results indicate the formation of 14 clusters and 1 noise cluster. The evaluation of DBSCAN parameters was conducted using the grid search method to determine the combination that optimizes the Silhouette Score. Based on the grid search results, the best parameter combination was  $\text{eps} = 0,9$  and  $\text{minPts} = 3$ , yielding a Silhouette Score of 0,9932. The combination of the Louvain and DBSCAN algorithms enhances the separation of large communities into refined subcommunities while providing deeper insights into user interactions.

**Keywords :** Community Detection, Louvain, DBSCAN, Skincare