STRATEGI PEMASARAN *MARKETING MIX* (4P) BERDASARKAN HASIL *CLUSTERING K-MEANS* DAN *PARTICLE SWARM OPTIMIZATION* (PSO) (STUDI KASUS PADA PT. SENSWELL INTERNATIONAL)

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ABSTRAK

Tren industri parfum di Indonesia menunjukkan peningkatan minat terhadap produk lokal yang dinilai memiliki kualitas kompetitif serta potensi pasar yang besar. Namun demikian, penjualan produk PT. Senswell International dalam beberapa tahun terakhir mengalami fluktuasi dan belum mencapai target optimal. Untuk menjawab tantangan tersebut, penelitian ini bertujuan merumuskan strategi pemasaran menggunakan pendekatan *Marketing Mix* (4P) berdasarkan hasil clustering dengan metode *K-Means* yang dioptimasi oleh *Particle Swarm Optimization* (PSO). Data penjualan parfum diklasifikasikan ke dalam tiga cluster, yaitu penjualan rendah, sedang, dan tinggi. Evaluasi dengan *Davies Bouldin Index* (DBI) menunjukkan bahwa metode PSO memberikan kualitas cluster yang lebih baik DBI = 0,4942 dibandingkan dengan K-Means saja yaitu DBI = 0,5291, yang berarti PSO mampu meningkatkan efisiensi dan akurasi pengelompokan. Berdasarkan hasil clustering tersebut, strategi pemasaran disusun secara berbeda untuk tiap cluster meliputi diferensiasi produk, penyesuaian harga, pemilihan saluran distribusi, dan pendekatan promosi yang disesuaikan dengan karakteristik segmen pasar. Penelitian ini diharapkan dapat menjadi acuan dalam meningkatkan daya saing produk lokal dan efektivitas strategi pemasaran PT. Senswell International.

Kata Kunci: *Marketing Mix* (4P), *K-Means*, *Particle Swarm Optimization* (PSO), *Clustering, Davies Bouldin Index* (DBI)

MARKETING MIX (4P) STRATEGY BASED ON *K-MEANS CLUSTERING* AND *PARTICLE SWARM OPTIMIZATION* (PSO) (A CASE STUDY AT PT. SENSWELL INTERNATIONAL)

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ABSTRACT

The fragrance industry in Indonesia is experiencing a growing trend in consumer interest toward local perfume Products, which are increasingly recognized for their competitive quality and strong market potential. However, PT. Senswell International has faced fluctuating sales performance in recent years and has yet to meet its sales targets. This study aims to formulate marketing strategies using the Marketing Mix (4P) approach based on Clustering results derived from the K-Means method optimized by Particle Swarm Optimization (PSO). Perfume sales data were classified into three Clusters: low, medium, and high sales. Evaluation using the Davies Bouldin Index (DBI) shows that the PSO method provides better Clustering quality (DBI = 0,4942) compared to standard K-Means DBI = 0,5291, indicating improved Clustering efficiency and accuracy. Based on these Clusters, tailored marketing strategies were developed, including Product differentiation, price adjustment, distribution channel optimization, and promotional approaches suited to each segment. The results of this study are expected to serve as a strategic reference for enhancing the competitiveness of local perfume Products and improving the effectiveness of PT. Senswell International's marketing efforts.

Keywords: *Marketing Mix (4P), K-Means, Particle Swarm Optimization (PSO), Clustering, Davies Bouldin Index (DBI)*