

## **ABSTRACT**

### **CLUSTERING STUDY OF K-MEANS AND X-MEANS METHODS ON SAMSAT BAPENDA SERVICES IN LAMPUNG PROVINCE**

By

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This study discusses the analysis of public satisfaction with public services at the SAMSAT BAPENDA of Lampung Province using the K-Means and X Means clustering methods. The data used are secondary data derived from the 2024 Community Satisfaction Index (IKM) involving 1,610 respondents across 17 service units. Each respondent provided assessments of ten service indicators on a scale of 1–4. The research stages include data preprocessing, normalization, and the application of clustering algorithms. Evaluation was carried out using the Davies-Bouldin Index (DBI) to assess cluster quality. In addition, an analysis of service indicators (categories 1 and 2) was conducted to identify aspects of service that still need improvement.

The results show that the K-Means and X-Means methods are capable of clustering public satisfaction data, with X-Means being more adaptive in automatically determining the optimal number of clusters. The indicators of safety and comfort receive the highest number of low ratings and therefore become the main priorities for improvement, followed by service timeliness, the quality of facilities and infrastructure, and staff competence. In contrast, the indicator of compliance with requirements has the fewest low ratings and is considered to have been implemented well. Overall, this study provides a mapping of SAMSAT service quality based on IKM data along with recommendations for service improvement.

**Keywords:** Clustering, K-Means, X-Means, Community Satisfaction Index, public service.

## ABSTRAK

### STUDI KLASTERISASI METODE *K-MEANS* DAN *X-MEANS* PADA PELAYANAN SAMSAT BAPENDA PROVINSI LAMPUNG

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Penelitian ini membahas analisis kepuasan masyarakat terhadap pelayanan publik pada SAMSAT BAPENDA Provinsi Lampung dengan menggunakan metode klusterisasi *k-means* dan *x-means*. Data yang digunakan merupakan data sekunder berupa Indeks Kepuasan Masyarakat (IKM) tahun 2024 dengan jumlah responden sebanyak 1.610 orang yang tersebar di 17 unit pelayanan. Setiap responden memberikan penilaian terhadap sepuluh indikator pelayanan dengan skala 1–4. Tahapan penelitian meliputi pra pemrosesan data, normalisasi, dan penerapan algoritma klusterisasi. Evaluasi dilakukan dengan Davies-Bouldin Index (DBI) untuk menilai kualitas kluster. Selain itu, dilakukan analisis indikator pelayanan (kategori 1 dan 2) pada setiap indikator untuk mengidentifikasi aspek pelayanan yang masih perlu ditingkatkan.

Hasil penelitian menunjukkan bahwa metode *k-means* dan *x-means* mampu mengelompokkan data kepuasan masyarakat, dengan *x-means* lebih adaptif dalam menentukan jumlah kluster optimal secara otomatis. Indikator keamanan dan kenyamanan memperoleh penilaian rendah terbanyak sehingga menjadi prioritas perbaikan, disusul ketepatan waktu pelayanan, kualitas sarana dan prasarana, serta kompetensi petugas. Sebaliknya, indikator kesesuaian persyaratan memiliki penilaian rendah paling sedikit dan dinilai telah berjalan dengan baik. Penelitian ini menghasilkan pemetaan kualitas pelayanan SAMSAT berbasis data IKM serta rekomendasi perbaikan layanan.

**Kata kunci:** Klusterisasi, *K-Means*, *X-Means*, Indeks Kepuasan Masyarakat, pelayanan publik.