

INTISARI

Penelitian ini berjudul “Penerapan Algoritma Random Forest untuk Prediksi Penjualan pada UMKM Yuri Store”. Tujuan penelitian adalah mengimplementasikan metode machine learning dengan algoritma Random Forest untuk meningkatkan akurasi prediksi penjualan, sehingga dapat membantu perencanaan persediaan barang pada UMKM Yuri Store yang bergerak di bidang pemasaran digital produk herbal. Variabel penelitian meliputi metode pembayaran (Cash on Delivery/COD dan reguler) serta status pengiriman (terkirim, return, dan dibatalkan). Data penjualan yang digunakan adalah data 5 bulan terakhir di tahun 2025, dan metode analisis yang digunakan adalah regresi Random Forest.

Hasil penelitian menunjukkan bahwa model Random Forest Regressor mampu memberikan performa prediksi yang cukup baik. Nilai Mean Absolute Error (MAE) sebesar 12,70, Mean Squared Error (MSE) sebesar 538,634, dan Mean Absolute Percentage Error (MAPE) pada pengiriman COD dengan status diterima sebesar 22,75% serta pengiriman reguler sebesar 26,17%. Berdasarkan kategori kinerja MAPE, hasil tersebut termasuk dalam kategori reasonable atau dapat diterima. Model juga mampu menangkap tren umum permintaan harian dengan akurat, meskipun terdapat deviasi pada titik-titik tertentu.

Kesimpulan penelitian ini adalah penerapan algoritma Random Forest efektif dalam menangani kompleksitas data penjualan yang bersifat non-linear serta meningkatkan kualitas perencanaan stok. Dengan demikian, model ini dapat dijadikan solusi strategis bagi UMKM Yuri Store dalam mengoptimalkan pengelolaan persediaan, khususnya produk herbal yang memiliki masa kedaluwarsa terbatas.

Kata Kunci: Random Forest Regressor, Machine Learning, MAPE.

ABSTRACT

This study is entitled “Implementation of Random Forest Algorithm for Sales Prediction in UMKM Yuri Store”. The purpose of this research is to implement machine learning, specifically the Random Forest algorithm, to improve sales prediction accuracy and support inventory planning in UMKM Yuri Store, a digital marketing business focusing on herbal products. The research variables include payment methods (Cash on Delivery/COD and regular) and delivery status (delivered, returned, and canceled). The dataset consists of sales data from the last five months of 2025, and the analysis method employed is Random Forest regression.

The results indicate that the Random Forest Regressor model provides satisfactory predictive performance. The Mean Absolute Error (MAE) was recorded at 12.70, the Mean Squared Error (MSE) at 538.634, and the Mean Absolute Percentage Error (MAPE) for COD deliveries with accepted status was 22.75%, while regular deliveries reached 26.17%. Based on the MAPE performance scale, these results fall into the reasonable category, indicating acceptable prediction error levels. The model was also able to capture overall daily demand trends accurately, despite some deviations at certain points.

In conclusion, the application of the Random Forest algorithm proves effective in handling the complexity of non-linear sales data and enhancing inventory planning quality. Therefore, this model can serve as a strategic solution for UMKM Yuri Store in optimizing inventory management, particularly for herbal products with limited shelf life.

Keywords: Random Forest Regressor, Machine Learning, MAPE.