

PENGENDALIAN PERSEDIAAN DAN PERAMALAN PENJUALAN OLI DENGAN PENDEKATAN MIN-MAX STOCK PADA BENGKEL AAC MOTOR

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ABSTRAK

Bengkel AAC Motor menghadapi permasalahan dalam pengendalian persediaan oli akibat pola permintaan yang berfluktuasi sehingga berpotensi menimbulkan *overstock* dan *stockout*. Penelitian ini bertujuan menentukan metode peramalan yang paling sesuai serta merancang pengendalian persediaan menggunakan metode *Min-Max Stock*. Penelitian diawali dengan klasifikasi ABC untuk menentukan produk prioritas, kemudian dilakukan peramalan menggunakan metode *Single Exponential Smoothing* (SES), Croston, dan *Syntetos-Boylan Approximation* (SBA). Metode terbaik dipilih berdasarkan nilai *Mean Absolute Deviation* (MAD), *Mean Squared Error* (MSE), dan *Mean Absolute Scaled Error* (MASE) terkecil. Hasil klasifikasi ABC menunjukkan terdapat 17 SKU kategori A (79,43%), 20 SKU kategori B (15,58%), dan 49 SKU kategori C (4,99%) berdasarkan kontribusi nilai penjualan. Hasil perbandingan metode peramalan menunjukkan SES terpilih pada 12 SKU, SBA pada 4 SKU, dan Croston pada 1 SKU. Hasil peramalan digunakan sebagai dasar perhitungan *Min-Max Stock* untuk menentukan *safety stock*, *minimum stock*, dan *maximum stock*. Penerapan metode tersebut menurunkan *overstock* sebesar 80,60% dan *stockout* sebesar 36,72%, sehingga pengendalian persediaan menjadi lebih efektif.

Kata Kunci: Pengendalian Persediaan, Peramalan, *Min-Max Stock*, *Single Exponential Smoothing*, Croston, *Syntetos-Boylan Approximation*.

INVENTORY CONTROL AND ENGINE OIL DEMAND FORECASTING USING THE MIN-MAX STOCK METHOD AT AAC MOTOR WORKSHOP

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ABSTRACT

AAC Motor Workshop faces challenges in engine oil inventory control due to fluctuating demand patterns, which may lead to overstock and stockout conditions. This study aims to determine the most appropriate forecasting method and develop an inventory control system using the Min-Max Stock method. The research began with ABC classification to identify priority products, followed by forecasting using the Single Exponential Smoothing (SES), Croston, and Syntetos-Boylan Approximation (SBA) methods. The best forecasting method was selected based on the lowest values of Mean Absolute Deviation (MAD), Mean Squared Error (MSE), and Mean Absolute Scaled Error (MASE). The ABC classification results showed that there were 17 Category A SKUs (79.43%), 20 Category B SKUs (15.58%), and 49 Category C SKUs (4.99%) based on their contribution to total sales value. The forecasting comparison indicated that SES was selected for 12 SKUs, SBA for 4 SKUs, and Croston for 1 SKU. The forecasting results were then used as the basis for Min-Max Stock calculations to determine safety stock, minimum stock, and maximum stock levels. The implementation of the proposed method reduced overstock by 80.60% and stockout by 36.72%, resulting in a more effective inventory control system.

Keywords: *Inventory Control, Demand Forecasting, Min-Max Stock, Single Exponential Smoothing, Croston, Syntetos-Boylan Approximation.*