

ABSTRAK

CV Satya Abadi Carton Box merupakan perusahaan manufaktur yang bergerak di bidang pembuatan carton box dengan sistem produksi *Make To Order* (MTO). Meskipun menerapkan sistem MTO, perusahaan masih mengalami penumpukan persediaan bahan baku *carton box* jenis *single wall* dan *double wall* di gudang. Kondisi tersebut disebabkan oleh kebijakan minimum pemesanan dari pemasok serta *lead time* pengiriman yang relatif panjang dan tidak konsisten, sehingga berpotensi meningkatkan biaya penyimpanan dan menurunkan efisiensi operasional perusahaan.

Penelitian ini bertujuan untuk menentukan perencanaan persediaan bahan baku *carton box* menggunakan metode Algoritma *Wagner-Within* (AWW) guna meminimalkan total biaya persediaan. Data yang digunakan berupa data historis pemesanan bahan baku periode Januari 2025 hingga Desember 2025, data biaya pesan, biaya simpan, harga bahan baku, serta *lead time*. Tahapan penelitian meliputi uji normalitas, peramalan permintaan, perhitungan *safety stock*, serta perhitungan ukuran *lot* pemesanan menggunakan metode Algoritma *Wagner-Within* untuk menentukan jadwal dan jumlah pemesanan yang optimal.

Hasil penelitian menunjukkan bahwa metode Algoritma *Wagner-Within* mampu menghasilkan perencanaan persediaan bahan baku yang lebih optimal dibandingkan kebijakan perusahaan sebelumnya. Pada bahan baku jenis *double wall*, total biaya persediaan menggunakan metode kebijakan perusahaan sebesar Rp1.686.870,72, sedangkan dengan metode Algoritma *Wagner-Within* menjadi Rp1.556.132,28 sehingga diperoleh penghematan sebesar Rp130.738,44 atau efisiensi sebesar 7,75%. Sementara itu, pada bahan baku jenis *single wall*, total biaya persediaan berdasarkan kebijakan perusahaan sebesar Rp3.684.895,68 dan menurun menjadi Rp1.656.331,20 setelah menggunakan metode Algoritma *Wagner-Within*, sehingga diperoleh penghematan sebesar Rp2.028.564,48 atau efisiensi sebesar 55,05%.

Kata kunci: Persediaan, Bahan Baku, Algoritma *Wagner-Within*, *Lot Sizing*, Total Biaya Persediaan.

**INVENTORY CONTROL OF RAW MATERIAL FOR CARTON
BOXES USING THE WAGNER-WITHIN ALGORITHM METHOD
TO MINIMIZE TOTAL INVENTORY COSTS**

(A Case Study at CV Satya Abadi Carton Box, Bantul, Yogyakarta)

ABSTRACT

CV Satya Abadi Carton Box is a manufacturing company engaged in the production of carton boxes using a Make To Order (MTO) production system. Despite implementing the MTO system, the company still experiences an accumulation of single wall and double wall carton box raw material inventories in the warehouse. This condition is caused by the suppliers' minimum order policy and relatively long and inconsistent delivery lead times, which potentially increase holding costs and reduce the company's operational efficiency.

This study aims to determine the inventory planning of carton box raw materials using the Wagner-Within Algorithm (AWW) method to minimize total inventory costs. The data used are historical raw material ordering data from January 2025 to December 2025, ordering cost data, holding costs, raw material prices, and lead time. The research stages include normality tests, demand forecasting, safety stock calculations, and order lot size calculations using the Wagner-Within Algorithm method to determine the optimal ordering schedule and quantity.

The results of the study indicate that the Wagner-Within Algorithm method is capable of producing a more optimal raw material inventory planning compared to the company's previous policy. For double wall raw materials, the total inventory cost using the company's policy was Rp1.686.870,72, while the Wagner-Within Algorithm method reduced it to Rp1.556.132,28, resulting in savings of Rp130.738,44 or an efficiency increase of 43,1%. Meanwhile, for single wall raw materials, the total inventory cost based on the company's policy was Rp3.684.894,68 and decreased to Rp1.656.331,20 after implementing the Wagner-Within Algorithm method, resulting in savings of Rp2,028.564,48 or an efficiency increase of 55,05%.

Keywords: Inventory, Raw Materials, Wagner-Within Algorithm, Lot Sizing, Total Inventory Cost.