

ABSTRAK

Gudang Anik Jaya Plastik Benowo menghadapi kendala operasional berupa peningkatan jarak tempuh dan waktu pencarian akibat penerapan sistem penyimpanan acak (*randomized storage*). Fluktuasi stok musiman berisiko menyebabkan penumpukan barang yang tidak teratur. Permasalahan efisiensi ruang dan beban kerja fisik ini berkaitan langsung dengan *Sustainable Development Goals* (SDGs) Tujuan ke-8 terkait lingkungan kerja yang layak dan ergonomis, serta Tujuan ke-9 mengenai inovasi manajemen distribusi yang berkelanjutan.

Penelitian ini bertujuan merancang usulan tata letak gudang baru menggunakan metode *Class Based Storage* (CBS) untuk mengoptimalkan alokasi zona penyimpanan berdasarkan tingkat popularitas barang. Data historis pergerakan komoditas periode Juli – Oktober 2025 diolah terlebih dahulu untuk menghitung frekuensi perpindahan dan menentukan klasifikasi ABC. Kebutuhan luas lantai bersih untuk setiap blok dihitung melalui analisis *space requirement* dengan mempertimbangkan batas tumpukan aman sesuai karakteristik kemasan produk. Selanjutnya, performa tata letak usulan dievaluasi dengan membandingkan total momen perpindahan material antara layout awal dan layout usulan berdasarkan pengukuran jarak *rectilinear*.

Hasil klasifikasi ABC terhadap 357 item barang menunjukkan Kelas A (*fast moving*) berkontribusi sebesar 79,89% pergerakan, Kelas B (*medium moving*) 15,08%, dan Kelas C (*slow moving*) 5,03%. Barang Kelas A dan sebagian Kelas B ditempatkan di lantai 1 dekat titik *input/output* (I/O), sedangkan sisa Kelas B dan seluruh Kelas C dialokasikan di lantai 2. Penataan dilakukan pada pengalokasian posisi barang sesuai jenis kemasan (dus dan karung) tanpa mengubah struktur gang awal. Implementasi tata letak usulan terbukti meningkatkan efisiensi operasional secara signifikan, di mana total momen perpindahan berkurang dari 64.036,46 m/periode menjadi 44.113,76 m/periode, atau menghasilkan penurunan beban kerja sebesar 31,08%.

Kata Kunci: Tata Letak Gudang, *Class Based Storage*, Klasifikasi ABC, Jarak *Rectilinear*, Momen Perpindahan.

ABSTRACT

The Anik Jaya Plastik Benowo warehouse faces operational challenges in the form of increased travel distances and search times due to the implementation of a randomized storage system. Seasonal stock fluctuations risk causing disorganized stockpiles. These issues of space efficiency and physical workload are directly related to Sustainable Development Goal (SDG) 8, concerning decent and ergonomically sound working conditions, and SDG 9, regarding innovation in sustainable distribution management.

This study aims to design a proposed new warehouse layout using the Class Based Storage (CBS) method to optimize storage zone allocation based on the level of product popularity. Historical commodity movement data for the period July - October 2025 is processed first to calculate the frequency of movement and determine the ABC classification. The net floor area requirement for each block is calculated through a space requirement analysis by considering the safe stacking limit according to the characteristics of the product packaging. Next, the performance of the proposed layout is evaluated by comparing the total material movement moment between the initial layout and the proposed layout based on rectilinear distance measurements.

The results of the ABC classification of 357 inventory items show that Class A (fast moving) accounts for 79.89% of inventory turnover, Class B (medium moving) for 15.08%, and Class C (slow moving) for 5.03%. Class A items and some Class B items were placed on the first floor near the input/output (I/O) points, while the remaining Class B items and all Class C items were allocated to the second floor. The layout was organized by allocating item positions according to packaging type (boxes and sacks) without changing the original aisle structure. Implementation of the proposed layout proved to significantly improve operational efficiency, with total movement distance reduced from 64,036.46 m/period to 44,113.76 m/period, resulting in a 31.08% reduction in workload.

Keywords: *Warehouse Layout, Class Based Storage, ABC Classification, Rectilinear Distance, Displacement Moment.*