

## ABSTRAK

PT XYZ merupakan perusahaan manufaktur transformator yang memiliki gudang bahan baku pada Gedung C untuk mendukung proses produksi *Current Transformer* (CT) dan *Voltage Transformer* (VT). Kondisi gudang saat ini masih menggunakan metode *random storage* sehingga penempatan bahan baku belum teratur dan menyebabkan aktivitas *material handling* kurang optimal. Selain itu, keterbatasan kapasitas penyimpanan menyebabkan sebagian bahan baku ditempatkan pada area *aisle* sehingga menghambat proses penyimpanan dan pengambilan material. Permasalahan tersebut menjadi penting karena Gedung C akan dipindahkan ke bangunan baru sehingga diperlukan perancangan tata letak gudang yang lebih optimal. Penelitian ini bertujuan untuk menentukan kebutuhan penyimpanan bahan baku, menyusun alternatif desain *layout* gudang, serta merancang tata letak penyimpanan menggunakan metode *class based storage* dengan klasifikasi FSN dan perhitungan *rectilinear*. Metode *class based storage* dipilih karena mampu mengelompokkan material berdasarkan tingkat pergerakannya sehingga penempatan bahan baku menjadi lebih terstruktur. Perhitungan kebutuhan penyimpanan dilakukan berdasarkan rata-rata stok dan kapasitas media penyimpanan, kemudian material dikelompokkan berdasarkan klasifikasi FSN dan ditempatkan berdasarkan nilai *throughput* serta jarak *rectilinear*. Hasil penelitian menunjukkan kebutuhan penyimpanan pada gudang baru terdiri dari 63 palet, 11 rak aksesoris, 1 rak tabung gas, dan 21 rak palet dengan variasi tinggi level penyimpanan. Hasil klasifikasi FSN diperoleh 28 item *fast moving*, 133 item *slow moving*, dan 175 item *non moving*. Penelitian menghasilkan dua alternatif *layout* usulan dan *layout* usulan 2 dipilih sebagai *layout* terbaik karena menghasilkan total jarak perpindahan material lebih kecil yaitu sebesar 10.777,11 meter dibandingkan *layout* usulan 1 sebesar 11.806,44 meter, sehingga diperoleh selisih jarak perpindahan sebesar 8,72%. Sehingga, metode *class based storage* mampu menghasilkan tata letak penyimpanan yang lebih teratur dan mendukung efisiensi aktivitas *material handling* pada gudang baru Gedung C PT XYZ.

**Kata kunci:** *class based storage*, FSN, *rectilinear*, tata letak gudang, *material handling*.

## **ABSTRAK**

*PT XYZ is a transformer manufacturing company that has a raw material warehouse in Building C to support the production process of Current Transformers (CT) and Voltage Transformers (VT). The current warehouse condition still applies the random storage method, resulting in unorganized material placement and less optimal material handling activities. In addition, limited storage capacity causes some raw materials to be placed in aisle areas, which obstructs the storage and retrieval process. This issue becomes more important because Building C will be relocated to a new building, requiring a more optimal warehouse layout design. This study aims to determine raw material storage requirements, develop alternative warehouse layout designs, and design a storage layout using the class based storage method with FSN classification and rectilinear distance calculations. The class based storage method was selected because it is capable of grouping materials according to their movement levels, resulting in a more structured storage arrangement. Storage requirements were calculated based on average inventory levels and storage media capacity. Subsequently, materials were classified using the FSN approach and assigned to storage locations based on throughput values and rectilinear distances. The results showed that the storage requirements in the new warehouse consist of 63 pallets, 11 accessory racks, 1 gas cylinder rack, and 21 pallet racks with various storage level heights. The FSN classification results identified 28 fast-moving items, 133 slow-moving items, and 175 non-moving items. This study produced two alternative layout designs, and layout alternative 2 was selected as the best layout because it generated a shorter total material handling travel distance of 10,777.11 meters compared to layout alternative 1 of 11,806.44 meters, resulting in a travel distance difference of 8.72%. Therefore, the class based storage method is able to create a more organized storage layout and improve the efficiency of material handling activities in the new raw material warehouse of Building C at PT XYZ.*

**Keywords:** *class based storage, FSN, rectilinear, warehouse layout, material handling.*