Perancangan Model Alokasi Kontainer Kargo untuk Memaksimalkan Penghematan Biaya Gudang = Design of Cargo Container Allocation Model to Maximize Warehouse Cost Saving

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Abstrak

Container allocation problem selama ini identik dengan sistem dorong (push system) karena kegiatan mengalokasikan kontainer tersebut biasanya dirancang di depot kontainer laksana titik origin. Sistem dorong memiliki kekurangan dimana pengguna tidak fleksibel dalam mengontrol kapabilitas dan laju produksi di gudang selaku titik tujuan. Penelitian container allocation problem di titik tujuan dengan sistem tarik (pull system) adalah merancang sebuah model alokasi kontainer kargo dari depot kontainer ke gudang yang lebih hemat dengan metode mixed integer linear programming (MILP). Studi kasus dilakukan pada remote area pertambangan dengan data 306 kontainer kargo di depot kontainer yang akan di alokasikan ke 4 gudang. Setiap gudang memiliki kendala kapasitas area pembongkaran kontainer dan kapabilitas manpower dalam menerima jumlah line items dalam suatu kontainer kargo. Waktu tunggu (dwell time) dan biaya sewa kontainer per hari mulai dihitung ketika kontainer kargo pindah dari kapal menuju depot kontainer. Hasil perancangan model alokasi kontainer kargo menggunakan MILP dengan sistem tarik berhasil memaksimalkan penghematan biaya gudang sebesar 41,17% dan menuntaskan 306 kontainer kargo lebih cepat 7 hari dibandingkan dengan model alokasi kontainer kargo sebelumnya.
.....ontainer allocation problem so far is identical to the push system because the activity of allocating containers is usually designed at container depot as point of origin. The push system has a disadvantage where users are not flexible to control the capability and rate of production that occurs at warehouse as point of destination. Research on container allocation problem at point of destination with a pull system is to design a model to allocate cargo containers from container depot to warehouse which is more efficient using the mixed integer linear programming (MILP) method. The case study was conducted in a remote mining area with data on 306 cargo containers at the container depot which will be allocated to 4 warehouses. Each warehouse has constraints on unloading area capacity and manpower capability in receiving the number of line items in cargo containers. Dwell time and container rental cost per day start to be calculated when the cargo containers move from vessel to container depot. Results for the design of cargo container allocation model using MILP with a pull system successful to maximize warehouse cost savings of 41,17% and completing 306 cargo containers 7 days faster than the previous cargo container allocation model.