Optimalisasi Model Antrian Head Truck dengan Implementasi Pool dan Work Line Strategy Menggunakan Model Simulasi = Optimization of the Head Truck Queue Model by Implementing a Pool and Work Line Strategy Using a Simulation Model

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Abstrak

Terminal memiliki peran vital dalam aktivitas bongkar muat di dalam pelabuhan. Di dalam terminal, terdapat suatu indikator untuk menghitung kinerja pelayanan bongkar muat yang telah ditetapkan dalam Peraturan Direktorat Jendral Perhubungan Laut. Dalam peraturan tersebut dijelaskan bahwa B/C/H adalah Box/Crane/Hour, merupakan jumlah peti kemas yang dibongkar/muat dalam satu jam kerja tiap crane. Sementara, B/S/H adalah Box/Ship/Hour, dimana merupakan peti kemas yang dibongkar/muat per kapal dalam satu jam selama kapal bertambat. Terminal Peti Kemas Koja dalam melaksanakan kegiatan operasional bongkar muatnya memiliki standar B/C/H sebesar 24 dan B/S/H sebesar 52. Meskipun masih dinyatakan baik, namun pencapaiannya di beberapa tahun terakhir telah mengalami penurunan. Pencapaian B/C/H dan B/S/H sangat dipengaruhi oleh produktivitas proses bongkar muat peti kemas dari dan ke kapal di terminal. Saat ini, Terminal Peti Kemas Koja menerapkan dua strategi antrian, yaitu work line strategy dan pool strategy berdasarkan jumlah ketersediaan head truck. Work line strategy merupakan strategi antrian dimana setiap head truck harus melayani QCC tertentu selama beroperasi. Sementara, pool strategy memungkinkan semua lini kerja berbagi head truck dan kemudian bekerja secara paralel, dimana dapat meningkatkan efisiensi operasi di semua lini kerja, namun tetap memerlukan ketepatan jumlah operasi head truck. Dengan didasarkan aturan First Come First Served (FCFS) dalam metode pengiriman, penelitian ini ditujukan untuk mendapatkan strategi antrian yang optimal pada head truck dengan diterapkannya work line dan pool strategy dalam melaksanakan mekanisme perpindahan bongkar muat peti kemas di terminal melalui model simulasi yang dibuat di Arena Software Simulation. Model simulasi yang sudah dibuat akan diverifikasi dan divalidasi terlebih dahulu. Setelah model sesuai dengan kondisi lapangan, maka didapatkan hasil B/C/H dan B/S/H berdasarkan dua strategi antrian berbeda. Penelitian ini juga bertujuan untuk menentukan strategi yang tepat untuk mendapatkan kinerja head truck yang optimal di Terminal Peti Kemas. .....Terminals have a vital role in loading and unloading activities in ports. In the terminal, there are indicators to calculate the performance of loading and unloading services that have been stipulated in the Regulation of the Director General of Sea Transportation. The regulation explains that B/C/H is Box/Crane/Hour, which is the number of containers that are unloaded/loaded in one working hour per crane. Meanwhile, B/S/H is Box/Ship/Hour, which is a container that is unloaded/loaded per ship in one hour while the ship is moored. Koja Container Terminal in carrying out its loading and unloading operational activities has a B/C/H standard of 24 and B/S/H of 52. Although it is still declared good, its achievements in recent years have decreased. The achievement of B/C/H and B/S/H is strongly influenced by the productivity of the loading and unloading process of containers from and to ships at the terminal. Currently, Koja Container Terminal applies two queuing strategies, namely work line strategy and pool strategy based on the amount of availability. head trucks. Work line strategy is a queuing strategy where each head truck must serve a certain QCC during operation. Meanwhile, the pool strategy allows all work lines to share head trucks and

then work in parallel, which can improve operating efficiency in all work lines, but still requires the exact number of head truck operations. Based on the First Come First Served (FCFS) rule in the shipping method, this research is aimed at obtaining the optimal queuing strategy for the head truck by implementing a work line and pool strategy in carrying out the loading and unloading movement mechanism of containers at the terminal through a simulation model made at the Arena Software Simulation. The simulation model that has been made will be verified and validated first. After the model is in accordance with field conditions, B/C/H and B/S/H results are obtained based on two different queuing strategies. This study also aims to determine the right strategy to get optimal head truck performance at the Container Terminal.