On Optimizing PSA Berth Planning System

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Abstract—Competition among container ports continues to increase as the differentiation of hub ports and feeder ports progresses. Managers in many container terminals are trying to attract carriers by automating handling equipment, providing and speeding up various services, and furnishing the most current information on the flow of containers. At the same time, however, they are trying to reduce costs by utilizing resources efficiently, including human resources, berths, container yards, quay cranes, and various yard equipment.

When planning berth usage, the berthing time and the exact position of each vessel at the wharf, as well as various quay side resources are usually determined in the process. Several variables must be considered, including the length overall (LOA) and arrival time of each vessel, the number of containers for discharging and loading, and the storage location of outbound/inbound containers to be loaded onto/discharged from the corresponding vessel. Furthermore, we aim to propose berthing plan that will be "robust", since the actual arrival time of each vessel can vary substantially from forecast. This is particular important for vessels from priority customers (called priority vessels hereon), who have been promised berth-on-arrival (i.e. within two hours of arriving) service guarantee in their contract with PSA. A robust plan will also helps to minimize the frequent updates (changes) to berthing plan that have repercussion in resource and sta deployment within the terminal. Thus, the problem reduces to one of finding a berthing plan, so that priority vessels can be berthed-on-arrival with high probability, and the vessels can be berthed as close to their preferred locations as possible, to reduce the cost of transporting the containers within the terminal.

In this paper, we described an approach to address this problem.

[Full Text Not Available]