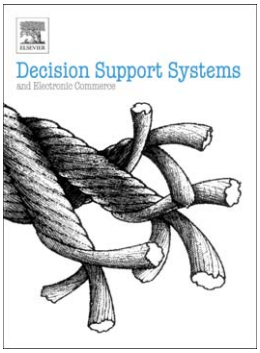

The Seaport Service Rate Prediction System: Using Drayage Truck Trajectory Data to Predict Seaport Service Rates

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PII: S0167-9236(16)30203-2
DOI: doi:10.1016/j.dss.2016.11.008
Reference: DECSUP 12791

To appear in: *Decision Support Systems*

Received date: 23 August 2015
Revised date: 10 October 2016
Accepted date: 29 November 2016

Please cite this article as: Meditya Wasesa, Andries Stam, Eric van Heck, The Seaport Service Rate Prediction System: Using Drayage Truck Trajectory Data to Predict Seaport Service Rates, *Decision Support Systems* (2016), doi:10.1016/j.dss.2016.11.008

The Seaport Service Rate Prediction System:

Using Drayage Truck Trajectory Data to Predict Seaport Service Rates

Abstract

For drayage operators the service rate of seaports is crucial for organizing their container pick-up/delivery operations. This study presents a seaport service rate prediction system that could help drayage operators to improve their predictions of the duration of the pick-up/delivery operations at a seaport by using the subordinate trucks' trajectory data. The system is constructed based on three components namely, trajectory reconstruction, geo-fencing analysis, and gradient boosting modelling. Using predictive analytic techniques, the prediction system is trained and validated using more than 15 million data records from over 200 trucks over a period of 19 months. The gradient boosting model-based solution provides better predictions compared with the linear model benchmark solution. Conclusions and implications are formulated.

Keywords: *Predictive Analytics, Gradient Boosting Model, Trajectory Data, Vehicle Telematics System, Seaport Appointment System, Drayage Operation*