

Process Mining towards Big data analytics in logistics environments: RORO Terminals

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Due to its convenience in the maritime industry, Roll on/Roll off (RORO) ships are very important for offering smooth and flexible services required by the modern world of trade. RORO shipping engenders an enormous mass of data generated from a set of processes, deriving from diverse sources and arranged in different structures. The management and analysis of this big data is extendedly important and possessing a greater impact on an ample range of industries including maritime transportation that serves as the engine fuelling global economic development. Therefore, It will impact on vessel performance monitoring and provide performance prediction, real-time transparency as well as decision-making support.

Several research studies have been conducted on RORO terminals, (Morales-Fusco et Saurí, 2009) runed a study about capacity calculation and determination of some quality indicators and integrated the developed model on an terminal in Spain. (Özkan et al., 2016) proposed methodology to establish the main quality indicators to be taken into account for a pure RORO terminal and evaluated using a RORO terminal in the Port of Barcelona. (Arof, 2018) developed a decision-making model for determining the potential of interstate RoRo operations in Archipelagic Southeast Asia supported by the Analytic Hierarchy Process (AHP). To our knowledge, no prior studies have examined RORO terminals using process mining. To fill this literature gap, this paper elaborates process mining as an analytics tool for RORO event data processing. Exploring process mining in accordance with complex event processing as big data analytics tools to simulate RORO terminals will have plenty of advantages for RORO shipping.

Considering the modeling objective that defines the simulation, the system should be able to relieve congestion and confront the future demand volume flows estimated at RORO port terminal. This simulation will help to identify the bottlenecks and deadlocks conditions as well as construct a clear picture of latency in the system. Process Mining techniques will help us picture the reality of what is hidden in RORO event for each model by gathering process statistics.