Capacity with a pOsitive enviRonmEntal and societAL footprInt: portS in the future era

D3.3: Process Modelling for vessel pit-stop operations

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Executive Summary

This document describes PORTMOD software, which aims to improve vessel pit stop operations. PORTMOD addresses container-handling challenges at Container Terminals. The Container Terminal operations are under constant change due to changes in customer demand and technology advances. Therefore, the operations should be constantly re-evaluated and improved in order to achieve the best performance. To evaluate and identify development possibilities, as well as to evaluate development ideas that may lead to improvements are challenging tasks. This document describes how PORTMOD is able to assist in the above-mentioned challenges.

The development of PORTMOD is motivated by filling a gap as a tool that suits research purposes and provides benefits to terminal operators. The user requirements derived for the software has been implemented and the software architecture is described in this document. The functionality principles and setup process is described and an example of its usage is given. The interface to PORTMOD is a simple Graphical User Interface.

PORTMOD is able to visualise container flows in a terminal and give key values for the container flows, e.g. container movement distance. Furthermore, PORTMOD is capable of filtering container flows with different filters in order to focus on specific container flows, e.g. export containers. PORTMOD is able to simulate machine and crane performance in a limited way. This enables to evaluate the impact of machine, crane or road network improvements. Furthermore, it is able to estimate the efficiency improvement of machine pooling in ship loading and unloading operation. The simulation result gives also key values, like machine travelling distance, which enables to analyse the change in CO_2 footprint. The input data for PORTMOD is extracted from a Terminal Operating System.

PORTMOD is a standalone software tool that is able to visualise container flows in a terminal, as well as provide limited simulation capabilities in order to estimate efficiency improvements. Hence, it supports the identification of efficiency improvements, as well as is able to estimate the impact of particular efficiency improvements. For the decision-oriented reader this document gives information on the benefits of using PORTMOD. For the technical readers this serves as a guide to setup and use PORTMOD.