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A DEC SICONSUPPORT SYSTEM ENTRONE CONSULT AND ADDRESS MARDAGEROFF BERRERE ERRORS Supervisors: Robert Stahlbock, Eduardo Aníbal Lalla Ruiz Students: Mats Hansen, Julia Kasch, Nils Schröder, Philippe Tiede



Examples of Berth Errors at the Container Terminal Burchardkai



The term berth error can be used to define the difference between the berth schedule determined ,a priori' with the information known beforehand and the schedule that has to be planned dynamically during the planning horizon. No error means the schedule is being performed as planned; an error disturbs one or more processes at a container terminal which may or may not influence other logistic partners, and provokes the replanning of related operations. In the worst case one berth error may lead to subsequent berth errors at other container terminals which are included in the route of the late coming ship. The occurence of erth errors is often dependent on the punctuality of ships, but also on the availability of berths fit for necessary performances.

HINTERLAND LOGISTICS PARTNERS HAVE LONGER WAITING TIMES

> **EXAMPLES FOR RE-SCHEDULING PROBLEMS**

PRE-SCHEDULED BERTH FOR THE PUNCTUAL SHIP

YARDS WITH CONTAINERS FOR THE PUNCTUAL SHIP

Terminal Processes



VEHICLES HAVE ONGER DRIVEWA

> **NEWLY-SCHEDULED BERTH** FOR THE OVERDUE SHIP

NECESSARY NUMBER OF QUAY CRANES MIGHT BI NOT AVAILABLE IN TIME

Decision Support System (DSS) with an integrated Information System





Example of Chosen Solution based on KPI Extra Costs

Key Performance Indicators (KPIs):

s extra costs

§ fulfilment of contractual deadlines

Concept of a framework

Real time data

Change of - time of arrival available equip.







total time to process the combination of actions reduction of the impact in percent

		KPIs			
Real-time event	Actions	\$	§	C	%
Vessel arrives late and interferes with an other vessel	Load both vessel at planned berth and load other vessel after delayed vessel is loaded	150	4/6	3	0
	Load delayed vessel after other vessel was loaded at planned berth	120	5/6	4	10
	Load delayed vessel at different berth and load other vessel as planned	100	5/6	6	10
	Load other vessel to different berth and load delayed vessel at planned berth	200	4/6	8	13

Resulting Schedule

