

Performance measurements in port communities

A focus on container terminal operations in increasing competition levels



Agenda

Background HPC

Background Port Performance

Performance Measurement

Example: Intermodal Connectivity

Background HPC

Company Information

HPC:

- Founded in 1976 as subsidiary of HHLA Hamburger Hafen und Logistik AG
- Around 100 experts, annual turnover in 2016: approx. EUR 15 million
- Since 1976 port and transport-related projects in more than 100 countries, both in the private and public sector
- Approx. 1,400 projects world-wide with extensive experience in container terminal planning

Mother-Company HHLA:

- 3 container terminals in Hamburg, capacity +10 mill TEU p.a.
- Multipurpose and bulk terminals
- Intermodal transport
- Logistics services



Background HPC Services

Our Focus

- Ports
 - Container terminals
 - Bulk terminals
 - Cruise ship terminals
- Logistics facilities
 - Rail terminals
 - Inland ports
 - Intermodal facilities



Our Clients

- Private terminal operators, port authorities & public institutions
- Governments
- Logistics service providers
- Banks and private investors
- International organisations, such as World Bank, Development Banks, UN, etc.

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Background Port Performance Overview

Port

- Transport infrastructure
- Port community
- Public agencies
- Private enterprises
- Multiple roles



Performance

- When: Service to clients
Whose clients?
- Where: At certain interfaces



Problem

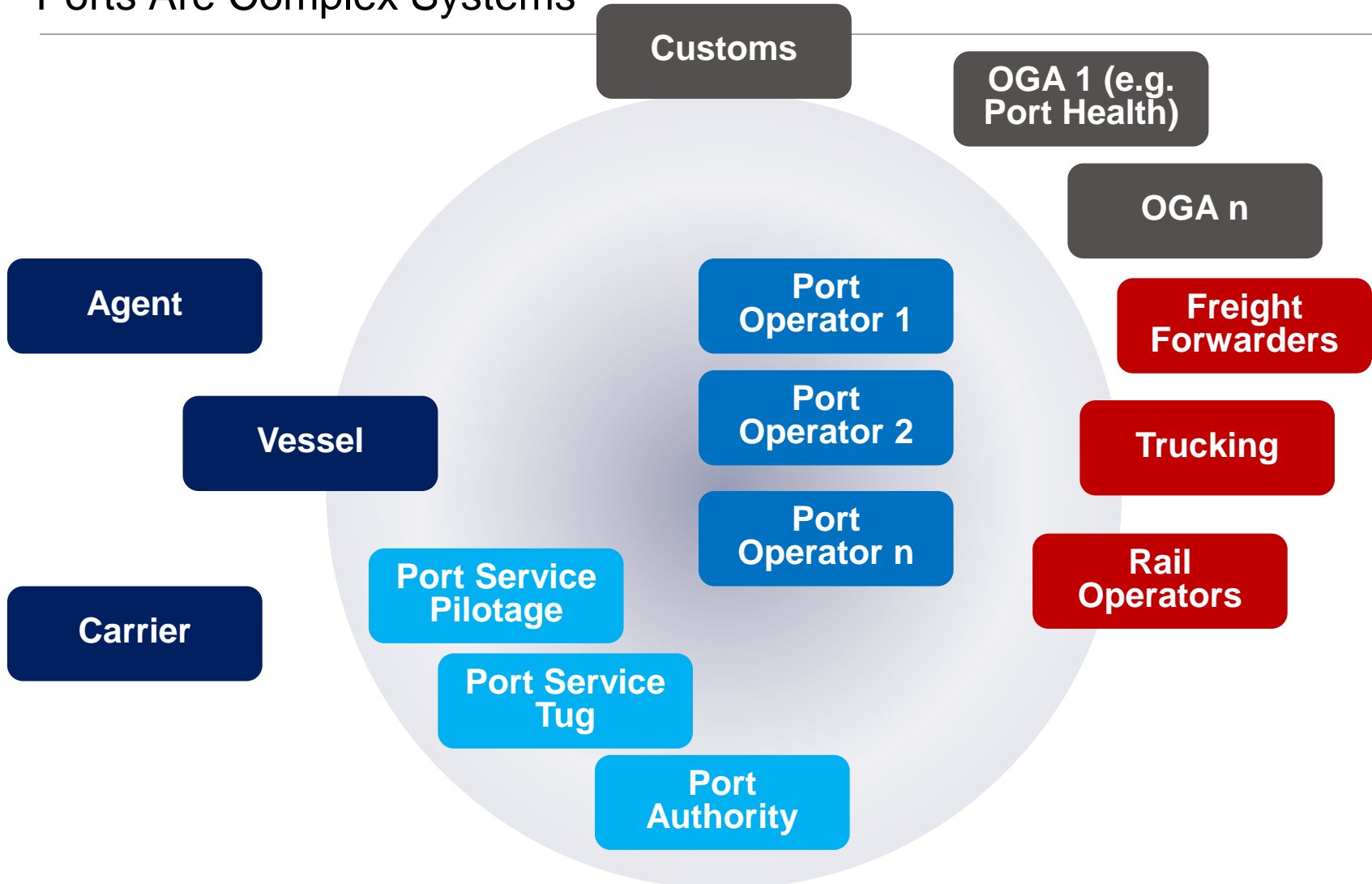
- Performance subject to multiple interdependencies
- Performance is often subject to contracts (SLAs)
- Performance often determined by legislative requirements (e.g. customs)

Dimensions

- Service performance
- Financial performance

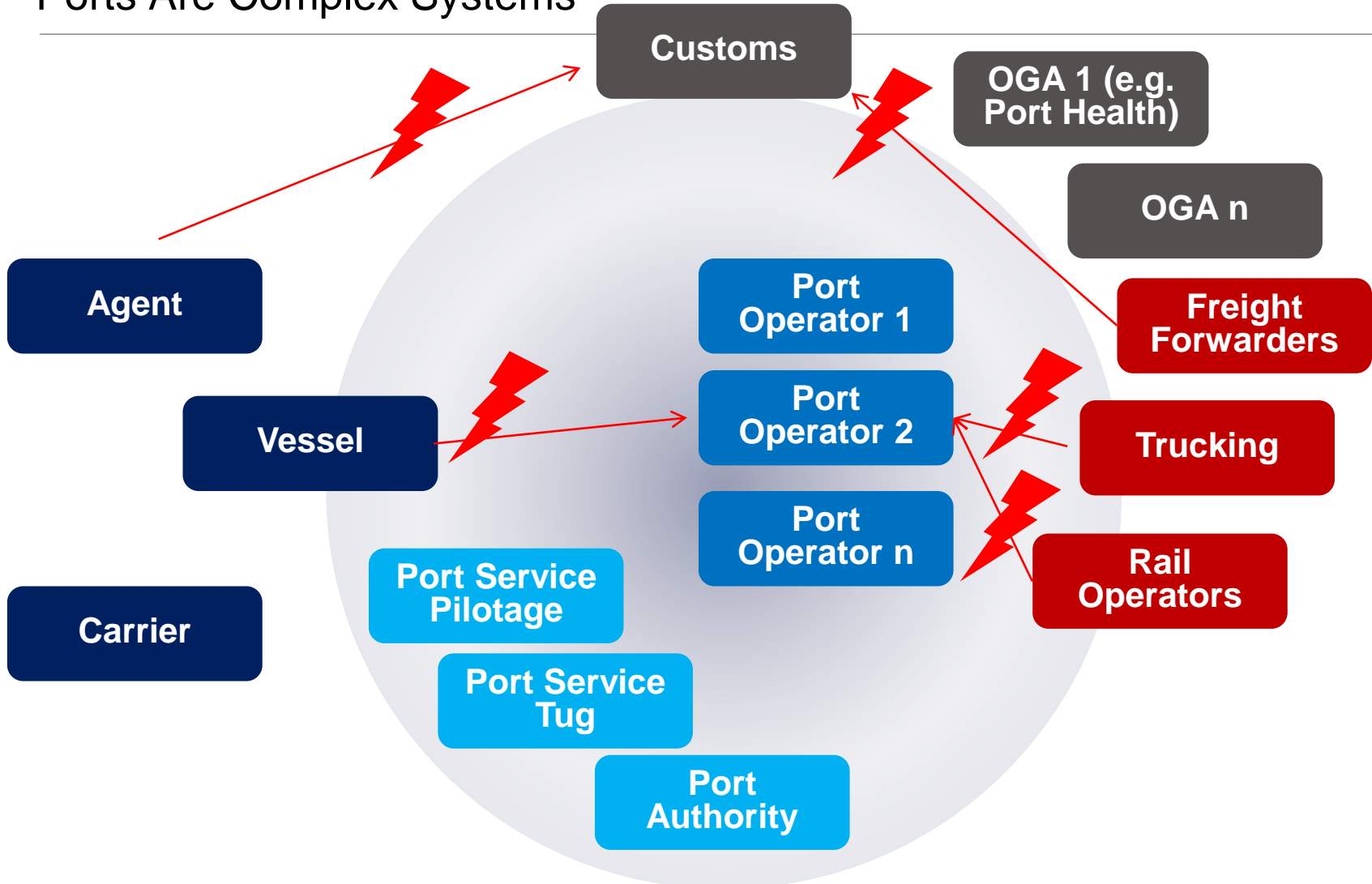
Background Port Performance

Ports Are Complex Systems



Background Port Performance

Ports Are Complex Systems



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Background HPC

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Performance Measurement

Example: Intermodal Connectivity

Performance Measurement

Process-Based Approach

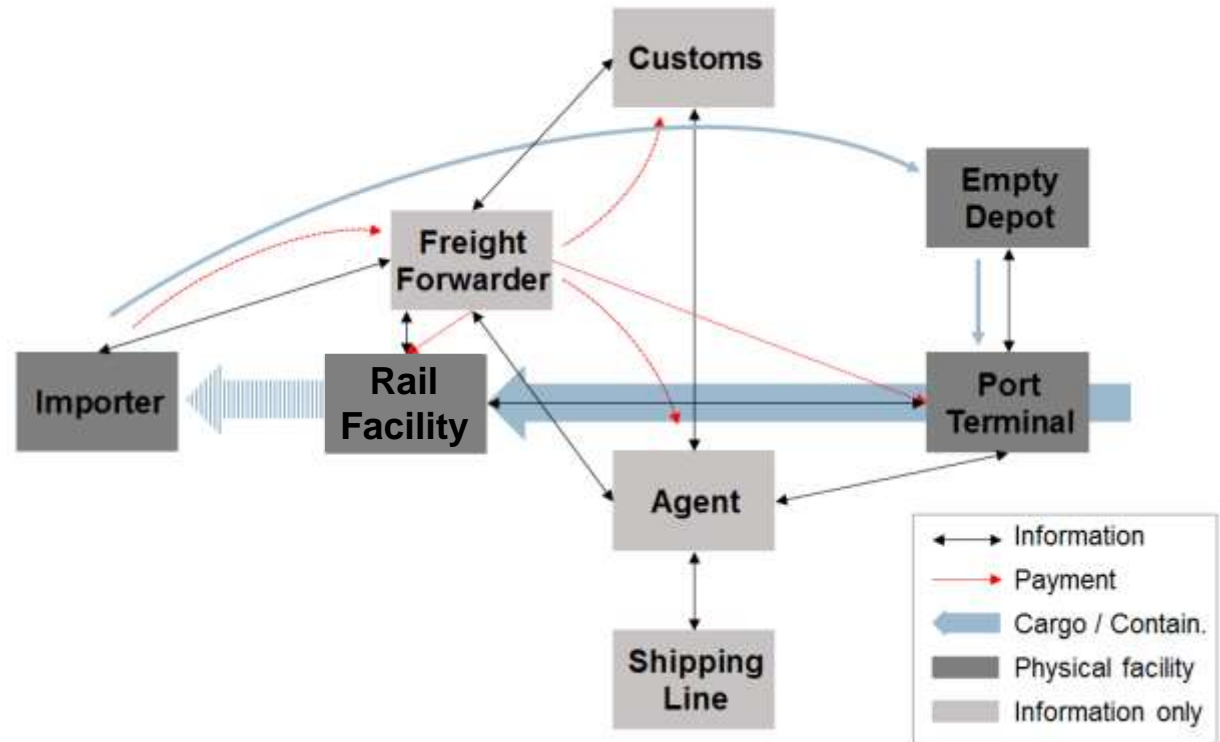
Target

- Port-wide Performance Measurement System
- Drilling deeper than existing dashboards or Port Regulators' reports
- Stakeholder engagement

Requirement

- Beginning with detailed process analyses

Process scheme: Import via Rail Facility



Performance Measurement

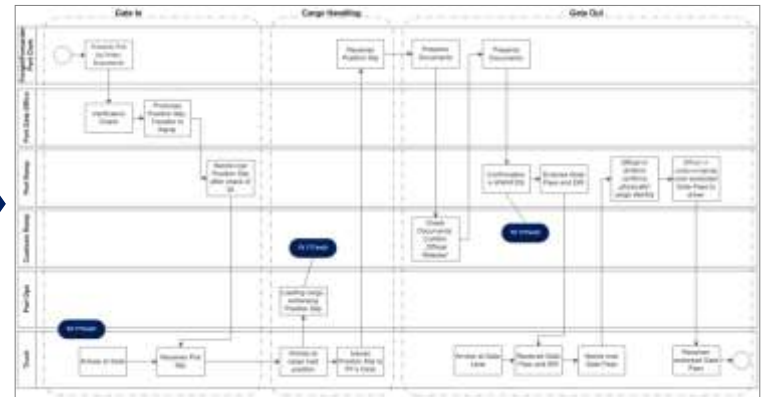
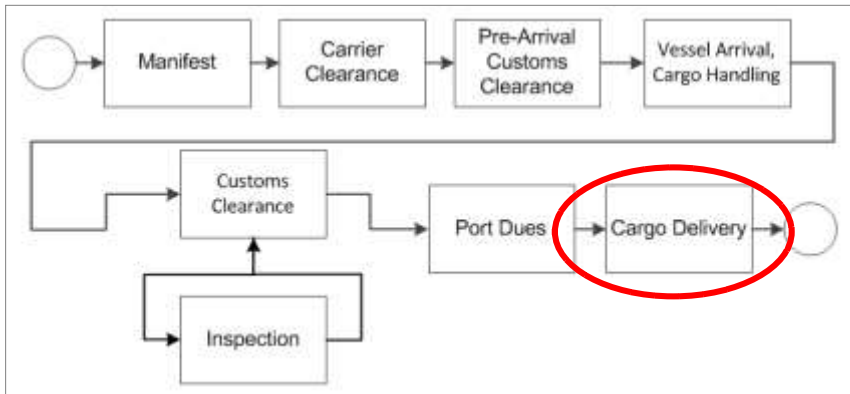
Process-Based Approach

Managing complexity

- Multitude of processes
- Complexity of procedures
- High degree of variability

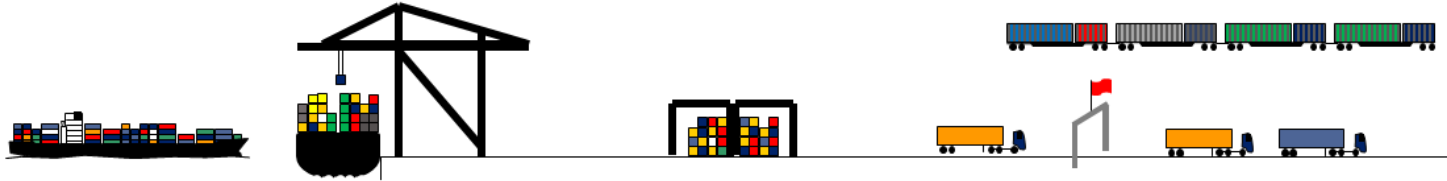


Individual port profiles:
Selection of relevant cargo trades



Performance Measurement

Identifying Core Performance Areas



Vessel Servicing

Why relevant

- Vessel costs
- Schedule maintenance
- Berth capacity

Drivers

- Vessel delays (other ports)
- Weather
- Marine services
- Berth availability
- Terminal performance

Dwell Time

Why relevant

- Cargo availability
- Capital lockup (cargo)
- Yard capacity

Drivers

- Manifest and clearing processes:
- Freight forwarder, customs, OGAs
- Risk management and inspections

Truck / Train Servicing

Why relevant

- Logistics costs
- Hinterland capacity (rail)
- Terminal capacity (trucks)

Drivers

- Processes in port operations
- Traffic (inside / public roads)
- Fraud / theft prevention, security processes

Performance Measurement

Principles for Defining KPIs and Targets

Relevance

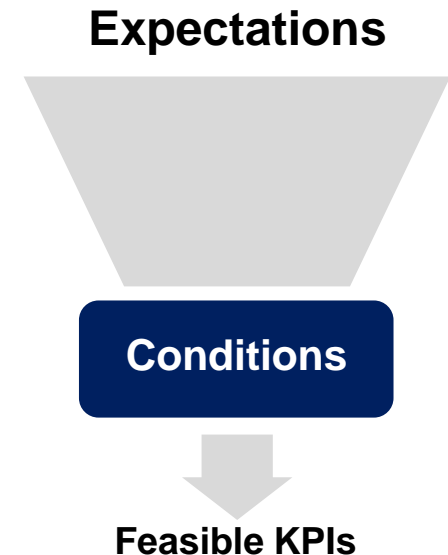
- Measurements that contribute to the project and describe core processes
- Ignore marginal activities

Practicability

- Measurements feasible to implement with a view to resources
- Measurements for which data will be available in a workable format, i.e. electronically transmittable with standard protocols

Sustainability

- Measurements that are maintainable in the future, i.e. data should be used from sources that are not project dependent but stable, e.g. Single Window, TOS
- Reduce number of measurements to avoid effects of weariness in the port community



Performance Measurement Systematic Setup

Implementing port performance monitoring

1. Sources

- Data generation / extraction and provision

2. Data processing entity

- Check integrity
- Transfer / alter data
- Load
- Compute KPIs
- Generate Reports
- Distribute / communicate reports

KPI measurements do not

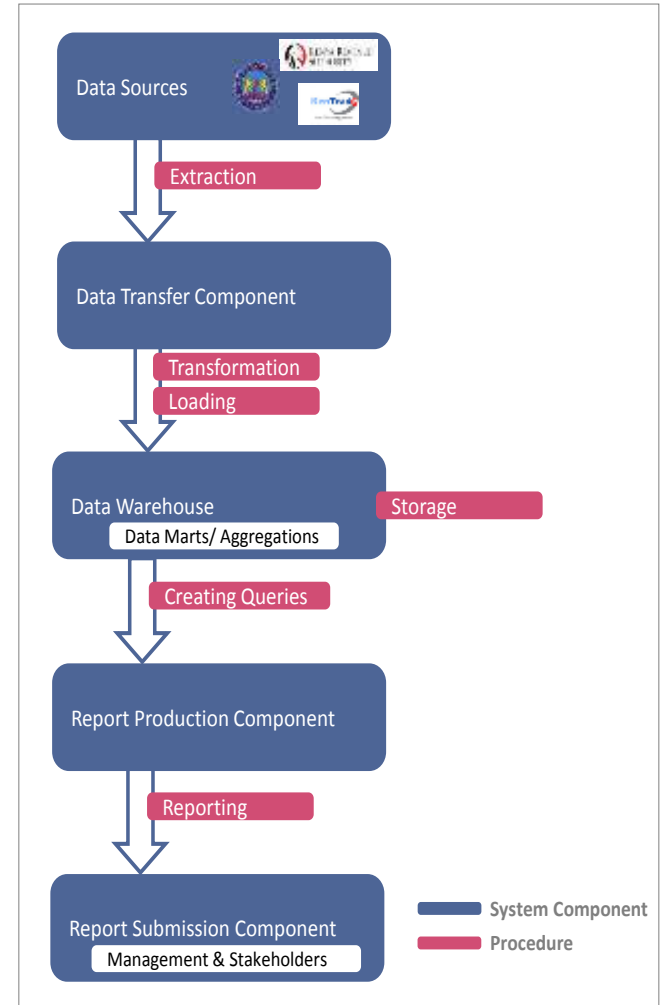
- provide explanations
- provide instruction how to improve

3. Port community



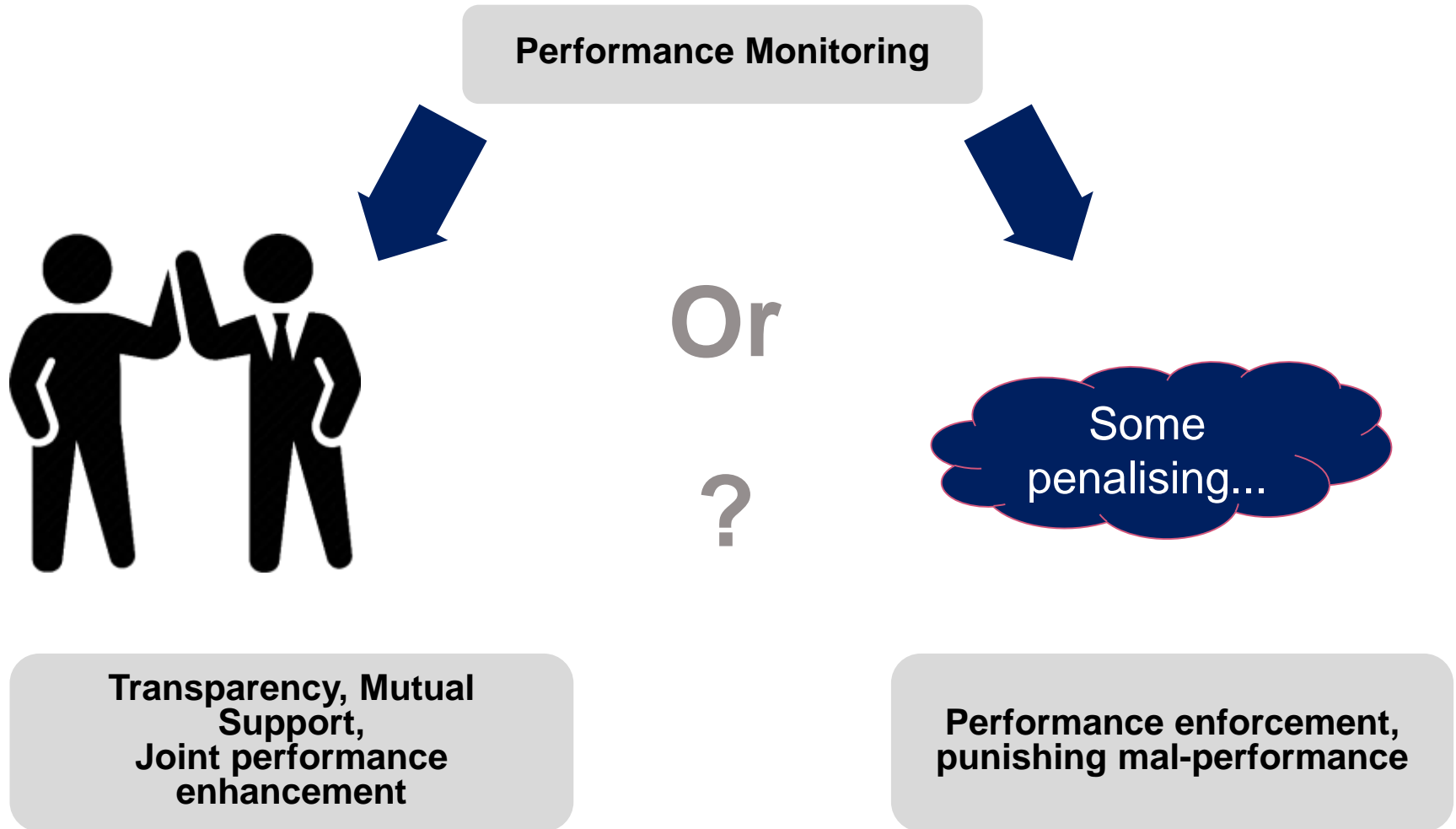
Data interpretation

Derive improvement measures



Performance Measurement

Which Way To Go For Responsible Authority?



Performance Measurement

Co-Operation vs. Regulation

Possible means of co-operation

- Transparent communication of KPIs
- Shared analyses of root causes
- Port meetings, website

Effects of co-operation

- Jointly identifying weaknesses
- Improving individual performance to optimize system competitiveness

Role of Monitoring

- Providing intelligence
- Facilitating transparency and dialogue
- Driving process of change within port community

Possible means of regulation

- Penalty payments
- License withdrawal

Effects of such regulation

- Defensive approach data sharing
- Protective interpretation of KPIs in port meetings
- Fingerpointing since performance can have multiple causes
- Law cases filed against regulator
- Deadlock situation

Performance Measurement

Benefits of Collaborative Approach

- Port Authorities in Rotterdam, Hamburg and others have established means for information sharing and are constantly expanding the horizon of data provision and communication.
- Likewise, private sector initiatives, such as truck appointment systems aim at improving a problematic situation for all involved parties.



- ➔ The Oversight Function should be interpreted in the same direction: **Providing information, highlighting weak points in performance and being an incubator for improvement campaigns.**
- ➔ Exerting the Oversight Function in such a **collaborative manner** would secure the port community's support.

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Performance Measurements

Example Performance Improvement: Intermodal Connectivity

Example: Intermodal Connectivity

Hamburg – Metrans/Polzug

AFTER PERFORMANCE ANALYSIS

Description of System

- Long distance private operator rail transport to Eastern Europe and Southern Germany
- Founded by terminal operator as part of vertical integration strategy **AFTER PERFORMANCE ANALYSIS**
- Full trains operate between port and inland terminals
- Various dedicated rail terminals and hub terminals in Poznan, Ceska Trebova and Prague
- Regular connection/service to Bremerhaven, Hamburg and Rotterdam

Driver / Initiator

- Improvement of hinterland connectivity and transport duration between port and market.
- Part of vertical integration strategy

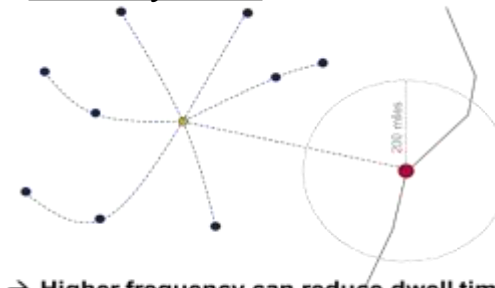
Capacity Factors

- Lack of information sharing from cargo owners/forwarders limits the potential to move containers quickly to inland facilities. Dwell time for rail is not shorter than for trucks.
- Coordination of information in supply chain created in order to increase capacity and reduce cost.

Emission Reduction

- Electrically powered rail transport is assumed to result in 48.1g CO₂ per tkm, a 70% reduction over trucks.

Hub-System



Effects:

- Higher frequency possible due to volume consolidation
- Sorting efforts for import trains can be reduced
- More origins/destinations can be served
- Less schedule deviations expected

Traffic Impact

- Approx. 25% of Hamburg port volumes – some 2.3m TEU - are transported by rail
- Around 1.2m truck visits are avoided

Efficiency Factors

- Additional moves on seaport and inland terminal – long travel distance saves significant trucking fees
- Railway connection faster to market than trucking

Summary

Requirements to improve performance:

- Measure the „right“ things to learn the lessons and develop improvement options
- Transparency, coordination and information sharing is key to successful performance analysis AND improvement
- Example - **Intermodal** connection:
 - Hub network idea developed based on analysis of rail performance

Benefits from performance measurement approach:

- Deep understanding of processes and potential constraints to port development
- Basis for achieving improvements in port performance and therefore competitiveness
- Example - Benefits from efficient **intermodal** connections:
 - Reduced road congestion, emission reduction
 - Rail connection faster/more reliable to market than truck



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