Port Collaborative Decision Making (PortCDM)

– a concept for enabling enhanced fleet and port call performance

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TRANSFORMATION from AS-IS to Vision of PortCDM

THE VISION OF PortCDM

AS - IS

Actor A
Actor B
Actor C
Actor D
Actor E
Actor ...

PORTCDM SHARING PLATFORM

Actor 1
Actor 2
Actor 3
AS-IS: Uniqueness in port calls, with decreasing predictability rate

Predictability throughout the port call process

- Arrival
- Arrival Berth
- Departure
- Departure Berth
- Traffic Area

Time spent at berth for two frequently visiting Container ships

- Southern Scandinavia Port (SCP)
- East Mediterranean Port (EMP)

Time spent at berth for two frequently visiting Tanker ships

- Southern Scandinavia Port (SCP)
- Northern Scandinavia Port (NSP)

Time spent at berth for a frequently visiting Ro-Ro ship

- Southern Scandinavia Port (SCP)

Arrivals (SP 19, NSP 13), chronologically during Q3 + Q4 2017

Arrivals (SP 22, EMP 21), chronologically during Q3 + Q4 2017
Unproductive time in port visits
• operating time / time at berth is too low
• time at berth / total turnaround time is too low

Lower predictability in the latter phases of the port call process
SHIPS AND PORTS NEED TO BE CONNECTED

**Connected ports**
(origin)

**Connected ships**

**Connected ports**
(destination)

Port call coordination

Port call synchronization

Port-to-port collaboration (coordination and synchronization)

Enabling connectivity to hinterland for sustainable transport systems
PORTS ENABLING EFFICIENT SHIPPING

Optimal resource utilization
No unexpected waiting times
Fast turnaround

Precision in time of departure
Minimal waiting times
Just-in-time operations

High degree of predictability
Minimal chasing
Green Steaming
High degree of predictability

Port operator Port operator
Ports of origin

Port operator Port operator

Port operator

Port operator Port operator
Ports of destination
COMPONENTS FOR SUSTAINABLE TRANSFORMATION

PROJECT LEVEL

- **Standard for data sharing (PCMF)**
- PortCall Process Ontology and Metro Map
- Living Lab Approach for Actor Collaboration
- Digital Services for Situational Awareness

SUSTAINABILITY LEVEL

- **Standard For data Sharing (S-211)**
- PortCDM Maturity Model
- International Governance (IPCDMC)
- Low Barriers for 3rd party Innovation
- Principles for Collaboration
STANDARD FOR DATA SHARING FOR SUSTAINABLE INNOVATION

PROJECT LEVEL

**Standard for data sharing (PCMF)**

<table>
<thead>
<tr>
<th>Total number of port calls</th>
<th>43976</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number of port call messages</td>
<td>1 696 115</td>
</tr>
</tbody>
</table>

Port Calls Per Ship Type

- CONTAINER: 2334
- PASSENGER: 6501
- BULK CARRIER: 1756
- OFFSHORE: 7943
- RO-RO: 13407
- TANKER: 9206
- OTHER: 2829

**Time Types**

- Actual: 42.0%
- Estimated: 20.3%
- Planned: 1.7%

COMMERCIAL LEVEL

**Standard For data Sharing (S-211)**

State type
- Location state
- Service state
- Administrative state

Time type
- Planned
- Estimated
- Actual
- Recommended
- Required

Time sequence
- Arrival
- Departure
- Commenced
- Completed
- Requested
- Request received
- Confirmed
- Denied
- Cancelled
PORTCALL ONTOLOGY AND METRO MAP

Physical collaboration: 2%
Port call synchronization: 4%
Increased information: 9%
Increased predictability: 13%
Information: 14%
Port-to-Port: 14%
Digital collaboration: 21%
Common situational: 23%

Most revolutionary PortCDM feature

PortCDM will create a greater awareness of different actors' intentions

- fully agree: 48%
- agree at a great extent: 36%
- agree to some extent: 12%
- agree to a small extent: 4%
- don't agree: 0%

Upgrading ports in collaboration and data sharing informed by the PortCDM Maturity Model

**ENABLING THE PORT TO:**

- set ambitions and evaluate conditions for the Port to implement PortCDM.
- identify and communicate what internal and external actors can expect.
- elicit requirements for System Providers.

International Governance - IPCDMC

Join us in joining forces in global harmonization – www.ipcdmc.org
Collaboration – the enabler for enhanced performance

**PortCDM KPIs**
- Punctuality
- Duration time
- Predictability
- Capacity Utilization
- Berth Productivity
- Waiting times
PortCDM enables the transformation ...

<table>
<thead>
<tr>
<th>From</th>
<th>To</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fragmented situational awareness</td>
<td>Common situational awareness</td>
</tr>
<tr>
<td>Low information quality</td>
<td>High and reliable information quality</td>
</tr>
<tr>
<td>Lacking planning horizons</td>
<td>Predictable operations</td>
</tr>
<tr>
<td>Unstructured information exchange</td>
<td>Standardised data exchange</td>
</tr>
<tr>
<td>Sub optimized operations</td>
<td>Mature collaboration culture</td>
</tr>
<tr>
<td>Unnecessary waiting times</td>
<td>Just-in-time operations</td>
</tr>
<tr>
<td>Low IT maturity</td>
<td>Enhanced IT-systems and third-party innovation opportunities</td>
</tr>
</tbody>
</table>
PortCDM: The SUSTAINABLE INNOVATION

PortCDM will enable an enhanced basis for making better estimates

- fully agree: 62.5%
- agree at a great extent: 25.0%
- agree to some extent: 12.5%
- agree to a small extent: 0.0%
- don't agree: 0.0%

PortCDM will enable better access to reliable information

- fully agree: 56%
- agree at a great extent: 20%
- agree to some extent: 12%
- agree to a small extent: 12%
- don't agree: 0%

The Vision of PortCDM

... and acknowledged by the Maritime Industry, European Commission, IMO, UNCTAD, Nautical Institute, IALA, IHMA ...
Giving rise to ...

- Reduced turn-around times
- Just-in-time departures, arrivals, and operations
- Reduced chasing
- Optimized resource utilization
- Shared situational awareness within the maritime transport chain
Next steps

IPCDMC will
- Facilitate an emerging PortCDM ecosystem of users and service providers
- Refine and adopt PortCDM compliancy guidelines
- Maintain and further develop the concept and S-211
- Establish Regional PortCDM Councils for regional governance within IPCDMC

Practical steps for engaged actors:
- ensure interoperability with S-211
- discuss mutual benefits of PortCDM with collaboration partners and other actors
- help to establish a local “PortCDM community” to bring all the interested actors together
- participate in the IPCDMC either as a participant or an observer

- Business and operational opportunities for everyone …
  - shipping companies / vessels
  - terminal operators
  - shipping agents
  - VTS operators
  - port and maritime authorities
  - port control / pilot planning, tug operators, mooring companies, and service providers
  - hinterland operators
  - digital service providers
  - equipment manufacturers
The STORY of PortCDM from IDEA to a SUSTAINABLE INNOVATION

2005 --

PortCDM V 0.1

2013 -2019

PortCDM V 1.0

2020 --

The Vision of PortCDM

The Vision

of PortCDM

PortCDM

V 1.0

PortCDM

V 0.1
Concluding remarks

PortCDM can provide a significant IMPROVEMENT in the overall performance of the maritime transportation chain ecosystem.

Port CDM and digital data sharing provides significant positive benefits by enabling port call actors to plan, coordinate and synchronise activities more efficiently giving rise to enhanced and more efficient overall port call performance; and

The basic doctrine, procedures and standards for PortCDM have reached a level of maturity that enables them to be used as the foundation for a GLOBAL IMPLEMENTATION of PortCDM.
Thanks you!

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PortCDM has been brought to the maritime sector to stay, which is something that you should take into consideration in your efforts in contributing to sustainable shipping

- Let us join forces!!!