

CHALMERS
UNIVERSITY OF TECHNOLOGY

Department of
**MECHANICS AND
MARITIME SCIENCES**

**RI
SE**

Maritime Informatics for a high performing maritime industry

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Workshop 2022-06-06*

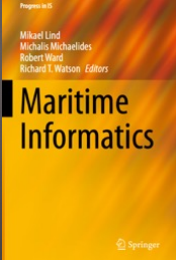
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Maritime informatics

- ▶ Balancing capital productivity and energy efficiency
- ▶ Responds to organisational, global, and humanitarian concerns
- ▶ Three focus areas:
 - ▶ Digital Collaboration
 - ▶ Digital Data Sharing and Decision-Making
 - ▶ Data Analytics



The application of information systems to increase the efficiency, safety, ecological sustainability, and resilience of the world's shipping industry






www.maritimeinformatics.org

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The maritime ecosystem is unique

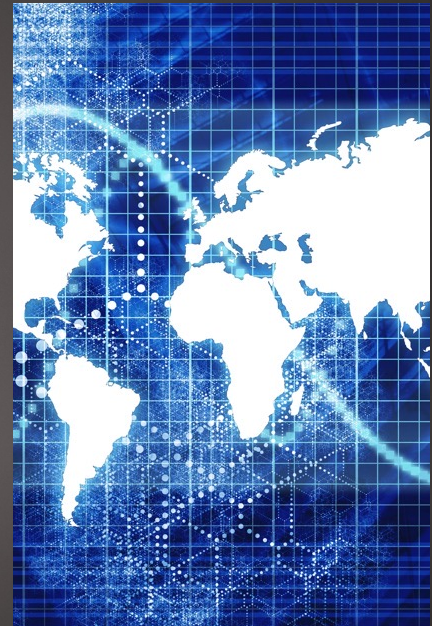


- ▶ Oldest and largest **sharing economy**
- ▶ **Global**
- ▶ **Flat**
- ▶ **Self-organized**
- ▶ **Federated** and **democratic** governance
- ▶ **Asset intensive** with **high demands** on **optimized resource utilization**
- ▶ **Not allowing for one owner**
- ▶ **Episodic interactions**

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Shipping is a self-organising ecosystem

- No single keystone organisation
- Distributed control
- Loosely coupled organizations adapting autonomously and organic

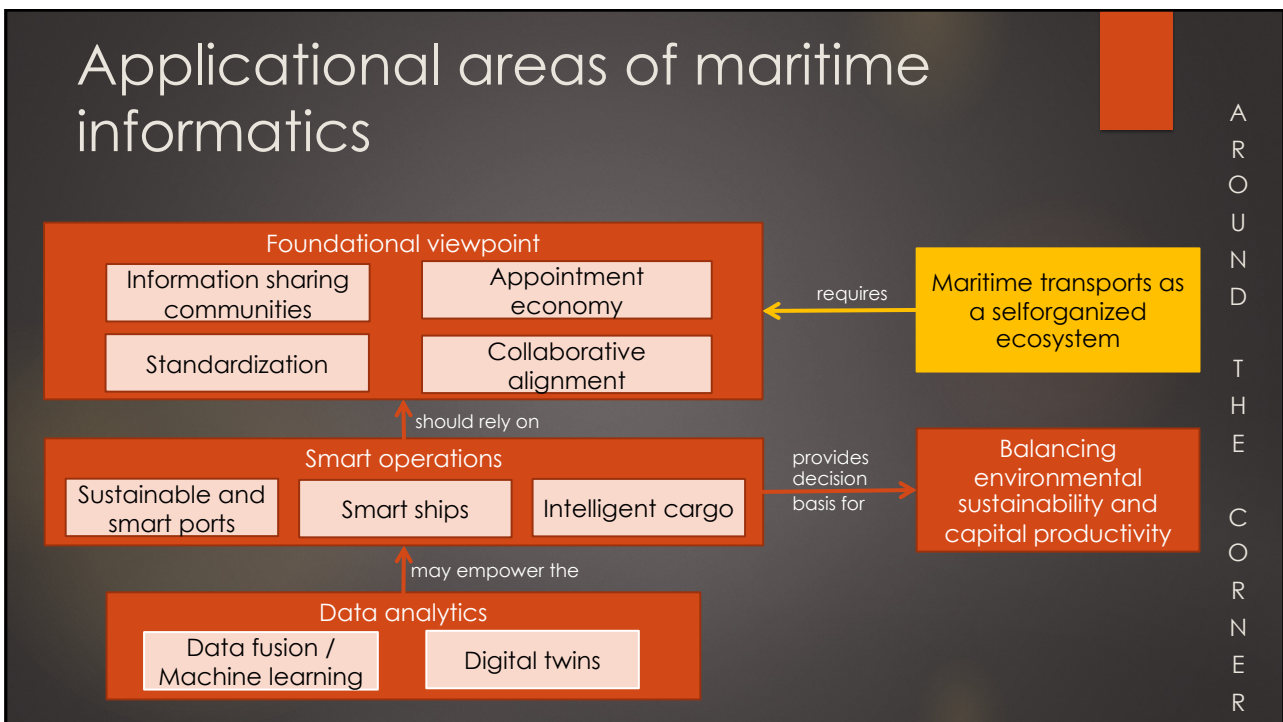


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What is the need?

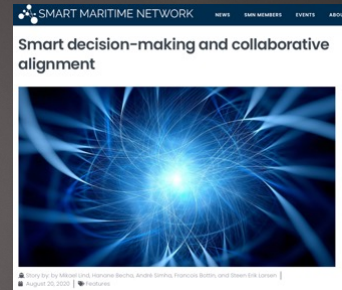
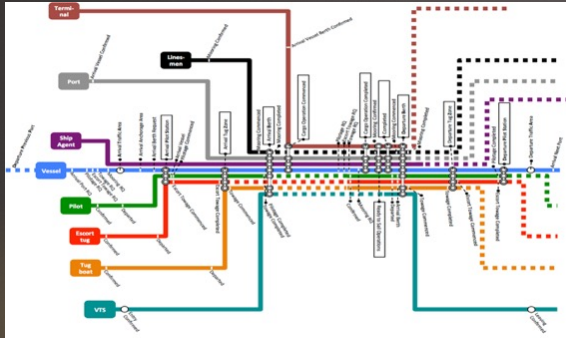
- Connecting what happens@sea with what happens@shore
- Enhanced predictability of movements and operations
- Increased information transparency with direct and indirect stakeholders
- Seamless integration with the multimodal transport chain
- Engaged scholars and reflective practitioners joining the same discourse - maritime informatics
- Upgrade of human capabilities in digitalisation

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Processes for collaborative alignment



- ▶ Empowered situational awareness
- ▶ Pieces of information needs to be brought together
- ▶ No one sits on the whole truth

A foundation to move **from** coordinating based on physical presence **to** virtual coordination

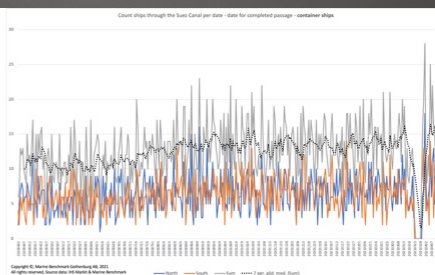
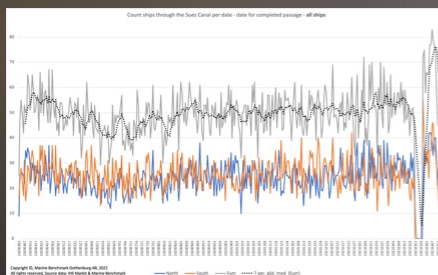
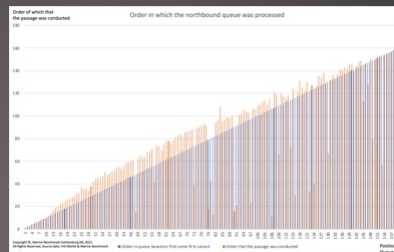
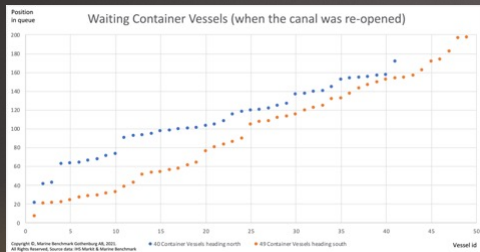
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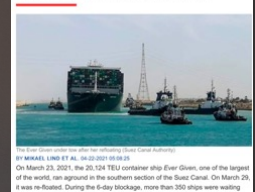
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The need: to enhance predictability



The Maritime Executive

Predicting Ship Transits in Capacity-Constrained Areas



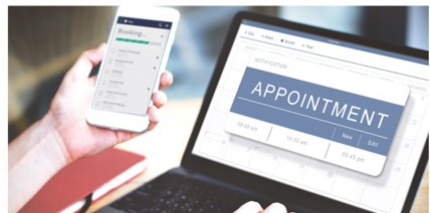
On March 23, 2021, the 20,124 TEU container ship Ever Given, one of the largest of the world, ran aground in the southern section of the Suez Canal. On March 25, it was re-floated. During the 6-day blockage, more than 300 ships were waiting.

...which requires data analytics based on AI techniques

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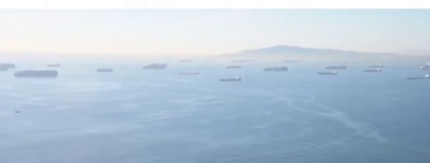
Welcome to the "appointment economy"

Published January 29, 2020



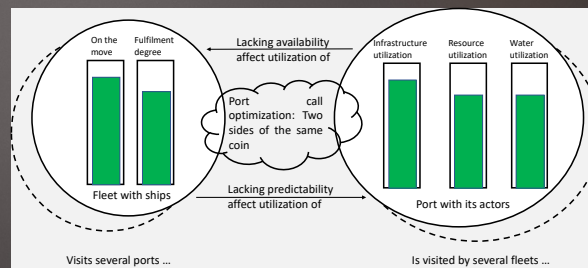
Otto Schacht • 1st
EVP Sea Logistics, Kuehne + Nagel
18h • Edited •

US Coast Guard Video last week above LGB/LA. This morning another 29 container vessels waiting, 221,000 TEU. In Oakland 9. I was looking on our platform #SeaExplorer every morning at one specific 14,800 TEU vessel, it finally got a berth after waiting 14 days!!!, now discharge operations will probably last for 5-7 days. So almost 3 weeks in LA/LGB. All this has major consequences for supply chains.



The maritime appointment economy

- ▶ A self-organised ecosystem implies distributed coordination
- ▶ Just-in-time shipping, (elastic) slot management, virtual arrival clause (BIMCO) and virtual queue tickets is high on the agenda
- ▶ Market places for trading appointments??



Visits several ports ...

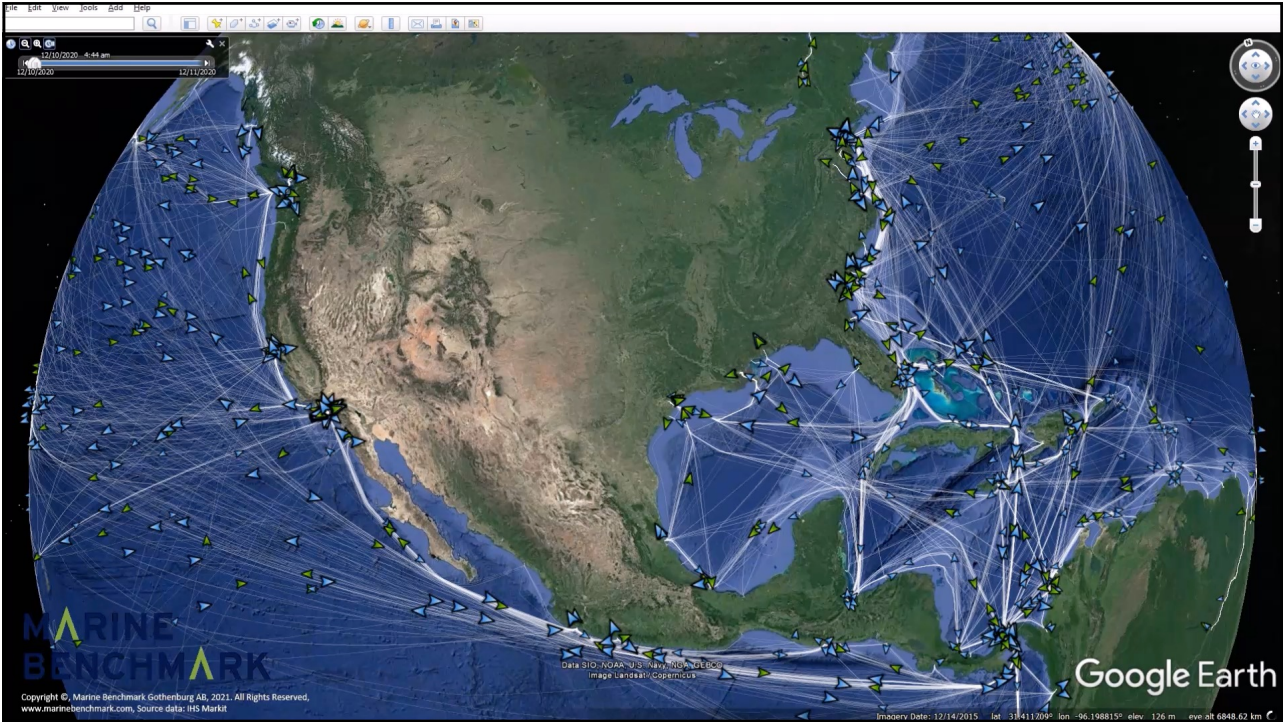
Is visited by several fleets ...

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Emerging situation in the Asia – Pacific Route

OUTBOUND FAR EAST MAIN PORTS

Container Type: 40' Standard Dry
TIC Metric: Volume (Standard)

Benchmark: Market Average
Source: Marine & Co. (www.marinebenchmark.com)

Contract Length: Short & Long Term (July 2020 - Q1 21)
*TIC Shipping Guarantees Free up to 400-425

Average distance sailed for each 4 week period between the two container ports Long Beach and Oakland

Y-axis: Nautical Miles (Nautical Miles)

X-axis: 4 week periods starting at 1st Jan 2020

Days off or at measuring speed before port call to Oakland

Y-axis: Days off or at measuring speed before port call

X-axis: 2020-01-01 to 2021-05-31

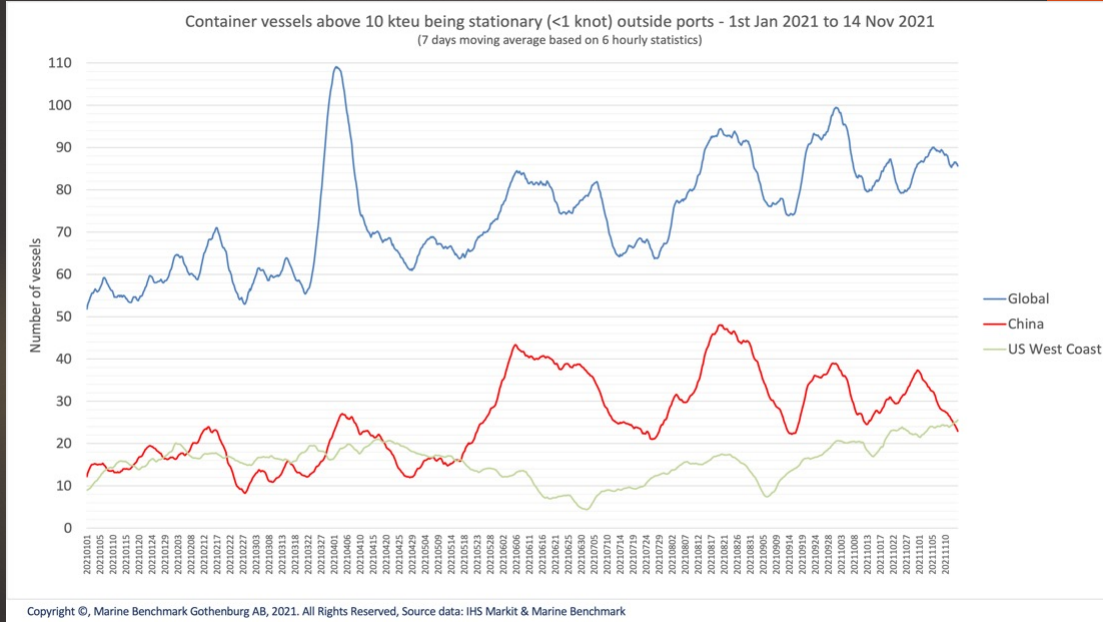
The Maritime Executive

How Time Slot Management Could Help Resolve Port Congestion

By Mikael Lind, Wolfgang Lehmann, Jan Hoffmann, Lars Jensen, Theo Nohmann, Torgny Östberg, Peter Sand, Sandra Hørdum, Rachel White, Hansine Beche and Plank Berglund

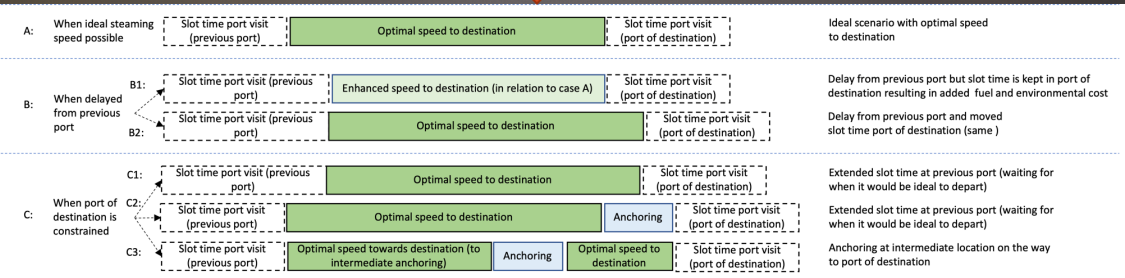
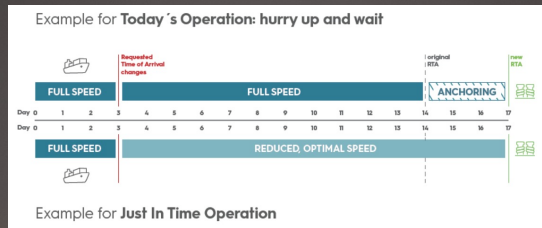
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Emerging situation in the Asia – Pacific Route

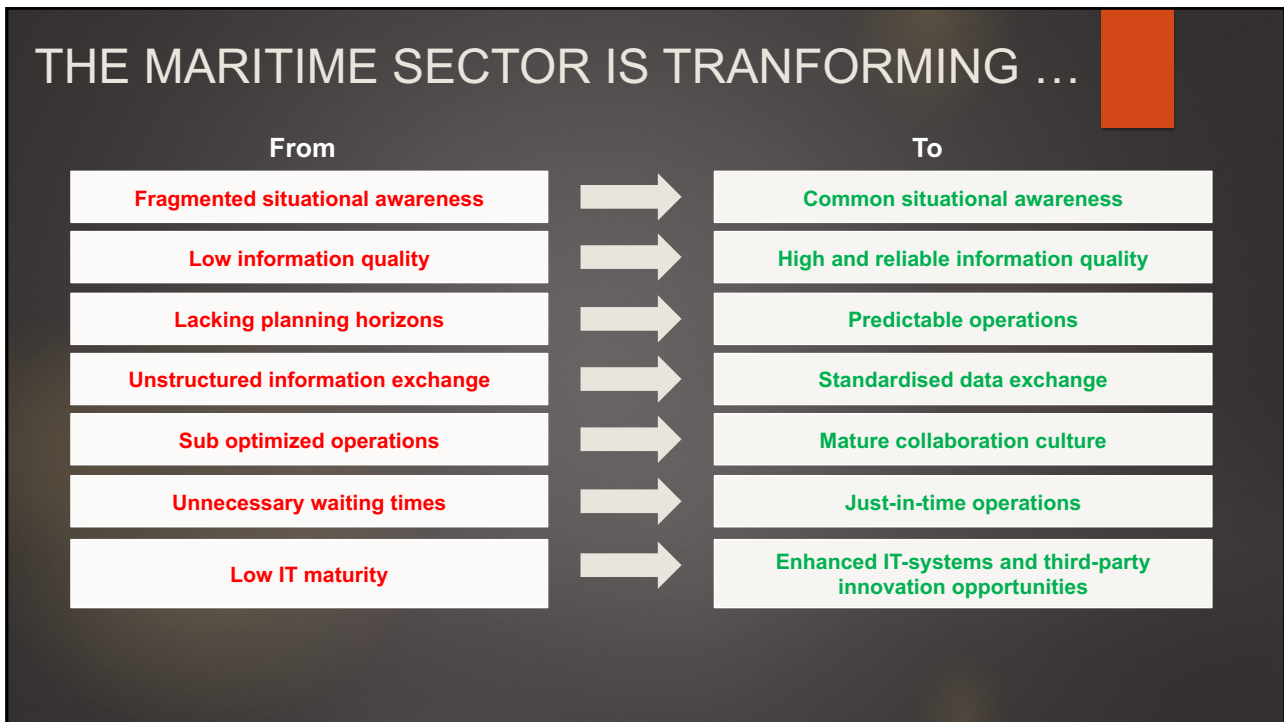


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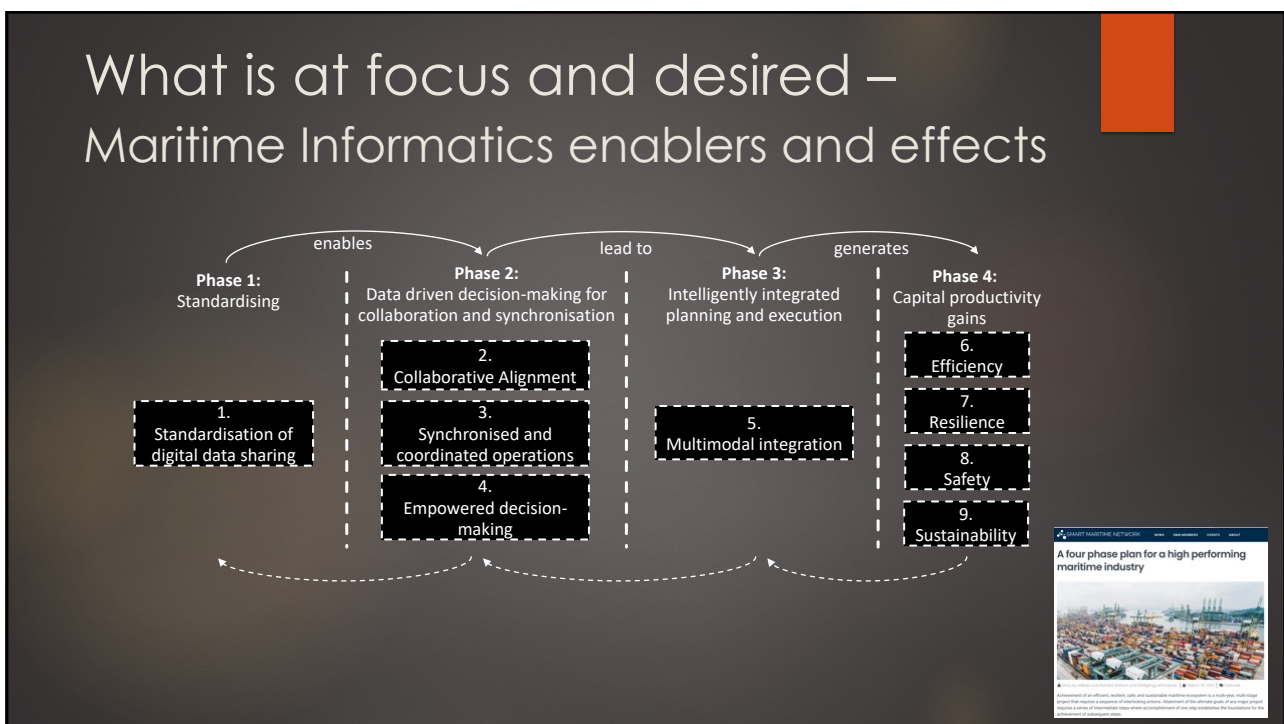
Challenging just-in-time arrival



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Concluding remarks (1)

MARITIME INFORMATICS

- ▶ An applied science for the maritime industry
- ▶ Engages both practitioners and researchers for a common goal
- ▶ Promotes standardized digital data sharing throughout the cargo chain
- ▶ Supports enhanced efficiency, safety, security, resilience, and sustainability in maritime transport
- ▶ Enables understanding, predicting, advising and improving maritime activity
- ▶ Enables seamless integration to the larger transport system

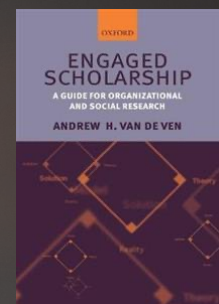
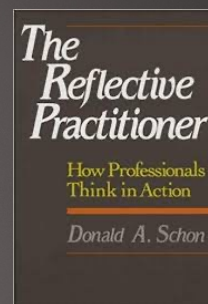
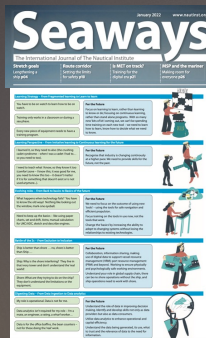
Maritime Informatics is the key to the future of maritime transport

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Concluding remarks (2)

▶ Maritime Informatics:

- ▶ A Science for change
- ▶ Requires Engaged Scholarship AND reflective practitioners
- ▶ Don't pave the cow paths
- ▶ A driver for MET of the future



FOCUS AREAS OF MARITIME INFORMATICS

Digital Collaboration

Digital Data Sharing and Decision-Making

Data Analytics

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Voices

"The COVID-19 crisis has given a further push to maritime informatics and the digitalization of logistics....", Jan Hoffmann,

"I am excited to see that several years of industry engagement has resulted in a consolidated, international Maritime Informatics initiative.", Lars Mathiasen

"Global trade and shipping industry have been advancing their business capability by adopting Maritime Informatics", Phanthian Zuesongdham

MARITIME INFORMATICS concerns MANY

"... Maritime Informatics could be the force that bring it all together to achieve facilitation and harmonization for the information exchange required when a ship is calling a port somewhere in the world", Mikael Renz

"By the discipline of Maritime Informatics, we can now join forces in securing a sustainable world.", Mikael Lind

"Maritime Informatics provides great opportunities to bring simplification to a sector that is conceived as very complex.", André Simha

For more voices visit www.maritimeinformatics.org

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Thank you!

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