

DIGITALISATION in Maritime Shipping

Britannia Loss Prevention Webinar – 03 Sept 2024 by Capt. Muhammad Khan



Digitalisation Speakers



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Digitalisation

Where to we stand?

- Digitalisation in the maritime shipping industry is not a new concept and many ports are working towards this goal.
- Maritime Single Window (IMO FAL Convention 1965 – as amended in 2022) – had become mandatory from 1 Jan 2024 for data exchange and that each jurisdiction to provide a digital platform for data exchange
- This session will also highlight the challenges and risks associated with Digitalisation.
- Still a long way from achieving a harmonised global digital platform in ports for data exchange

Digitalisation

FAL Convention – MSW

- The Maritime Single Window is covered under the Convention on Facilitation of International Maritime Traffic (FAL 1965, as amended in 2022). As of January 1, 2024, it has become mandatory for all IMO Member States to use a single, centralized digital platform to collect and exchange information with ships when they call at their ports. This aims to streamline procedures for the arrival, stay, and departure of ships, enhancing the efficiency of shipping worldwide.
- Implementation progress varies by country and port. Some ports have almost fully integrated the MSW, while others are still in the process of adapting their systems to meet the new requirements. The IMO has been actively supporting Member States through guidelines, e-learning courses, and awareness campaigns to facilitate this transition.

Digitalisation

Advantages

- The digitalization of maritime shipping is closely linked to the implementation of the Maritime Single Window (MSW). The MSW is a key component of the broader digitalization efforts in the maritime industry. It aims to streamline and enhance the efficiency of information exchange between ships, ports, and government agencies.
- By mandating the use of a single digital platform for the electronic submission and exchange of information, the MSW significantly reduces paperwork, minimizes delays, and improves the overall efficiency of maritime operations. This digital transformation is expected to benefit the global shipping industry by making processes more transparent, reliable, and faster.

Digitalisation

Risks & Challenges

Digitalization under the Maritime Single Window (MSW) brings several benefits, but it also comes with certain risks and challenges:

- **Cybersecurity Threats:** Increased reliance on digital systems makes ports and ships more vulnerable to cyber-attacks. Ensuring robust cybersecurity measures is crucial to protect sensitive data and maintain operational integrity.
- **Data Privacy Concerns:** Handling large volumes of data electronically raises concerns about data privacy and the potential misuse of information. Compliance with data protection regulations is essential.
- **Technical Challenges:** Implementing and maintaining the MSW requires significant technical infrastructure and expertise. Ports with limited resources may struggle to meet these requirements.

Digitalisation

Risks & Challenges

- **Interoperability Issues:** Ensuring that different systems and platforms can communicate effectively, is a major challenge. Standardizing data formats and protocols is necessary to achieve seamless information exchange.
- **Resistance to Change:** There may be push back / resistance from some stakeholders who are accustomed to traditional methods. Training and change management strategies are needed to facilitate the transition.
- **Operational Disruptions:** During the implementation phase, there might be temporary disruptions to port operations as systems are upgraded and staff are trained.

Despite these risks, the overall goal of the MSW is to enhance efficiency, reduce paperwork, and streamline maritime operations. Addressing these challenges proactively can help mitigate the risks associated with digitalization.

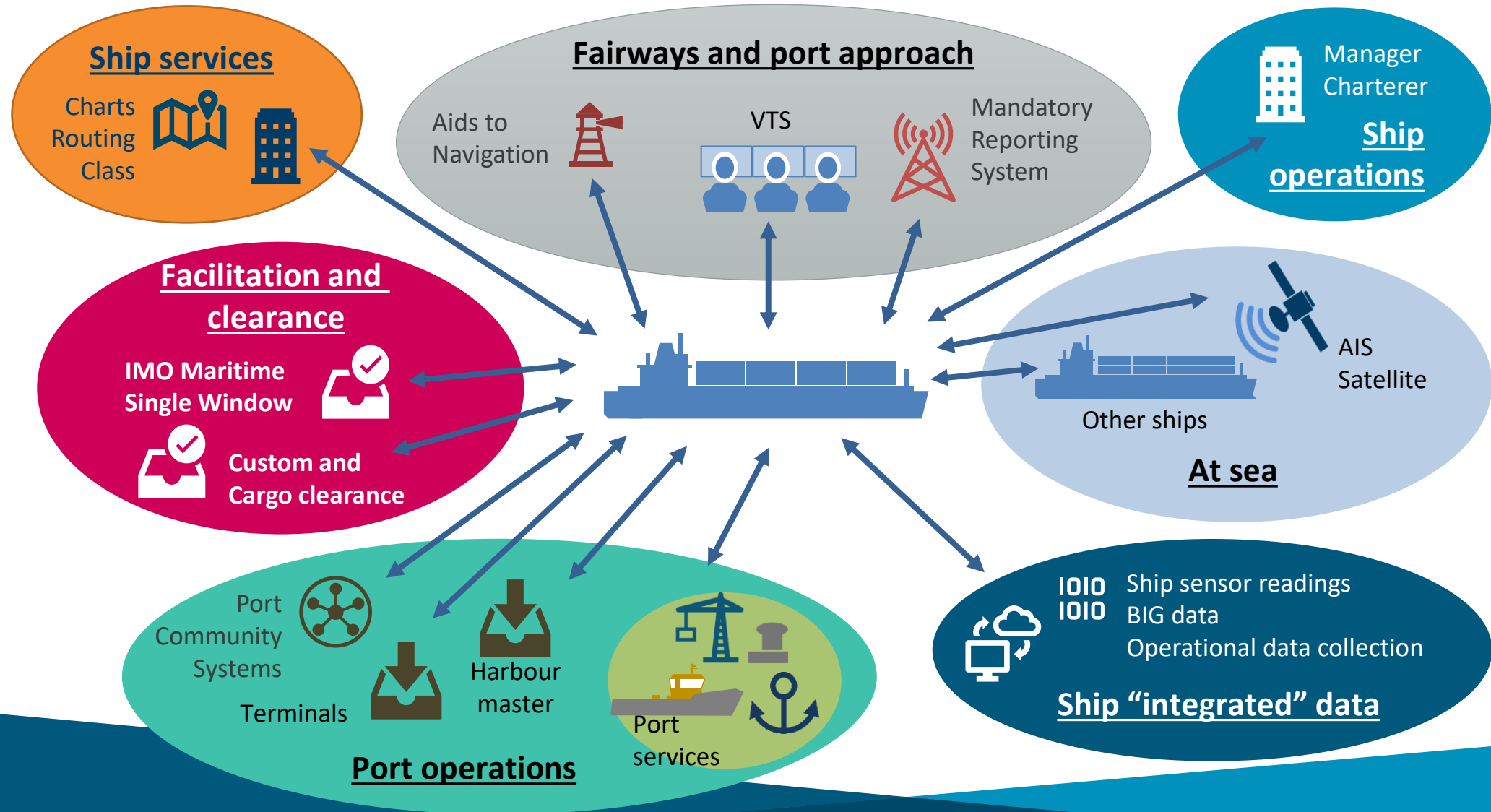
Maritime Digitalisation

Jeppé Skovbakke Juhl

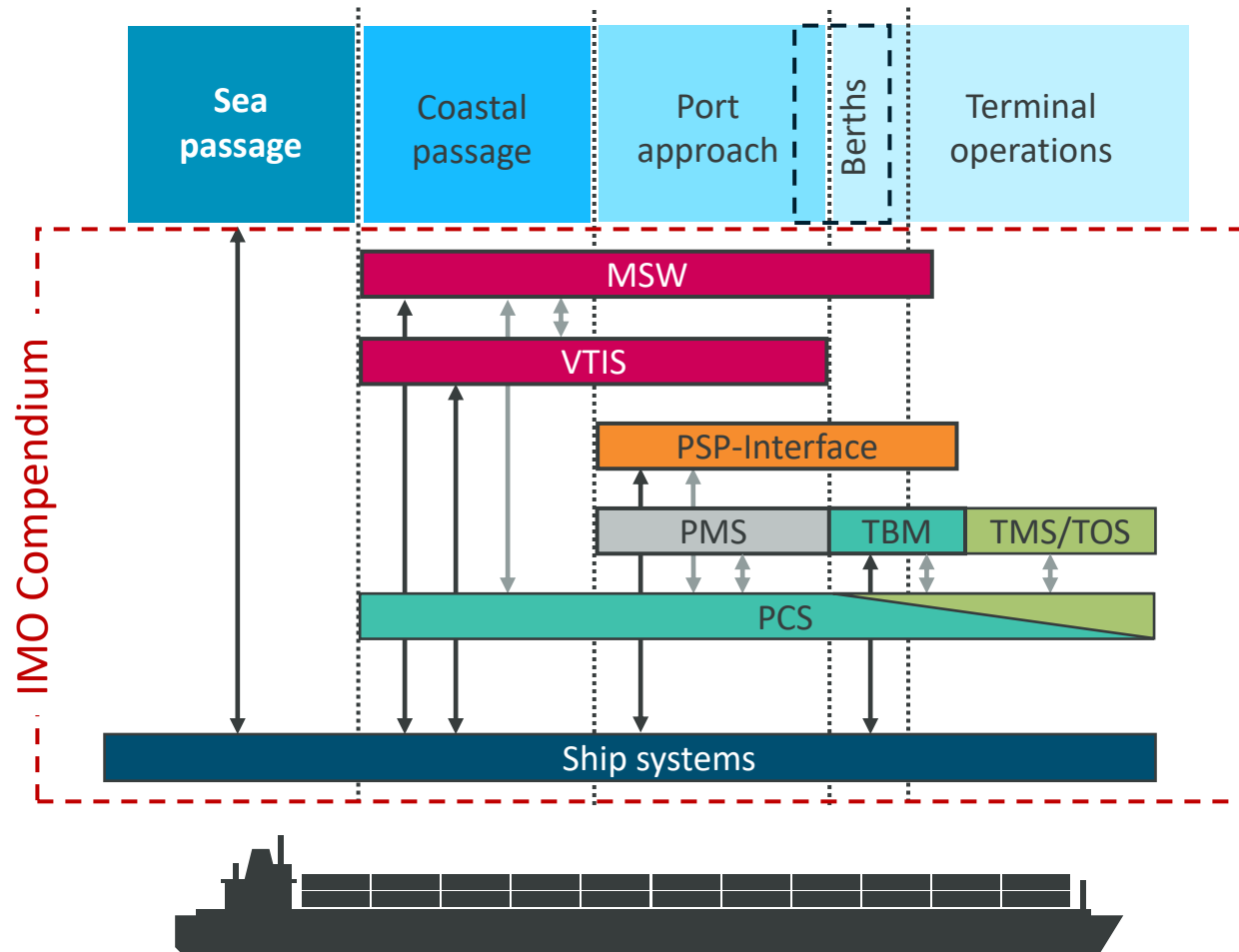
Manager, Safety and Security







Britannia P&I, Loss Prevention Webinar - September 3rd, 2024

Digital exchange between ship and shore



Platforms and systems



-  Public authority system
 -  Port authority system
 -  Private system
 -  Private services
 -  Non-nautical private systems
 -  Ship systems
-
- MSW** Maritime Single Window
 - VTIS** Vessel Traffic Information System
 - PSP** Port Service Provider
 - TBM** Terminal Berth Management
 - TOS** Terminal Operating System
 - TMS** Terminal Management System
 - PMS** Port Management System
 - PCS** Port Community System

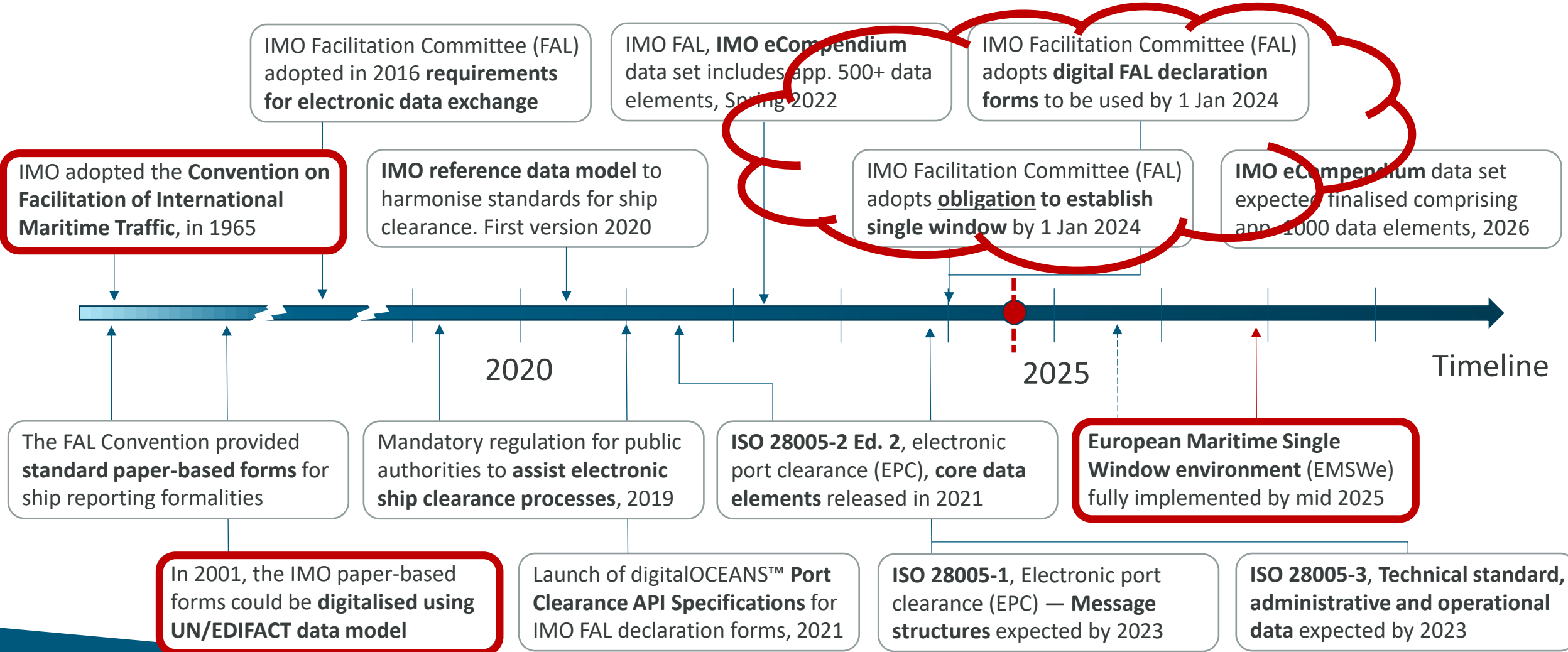
The main domains and standards organizations

- Authority/administrative (WCO, IMO)
- Telecommunication/Radio (ITU)
- Nautical (IHO, IALA, IEC)
- Operational (ISO, UNECE)
- Trade and commerce (UNECE)
- Bridge (IEC)
- Automation (IEC/ISO)
- Onboard data management (ISO)



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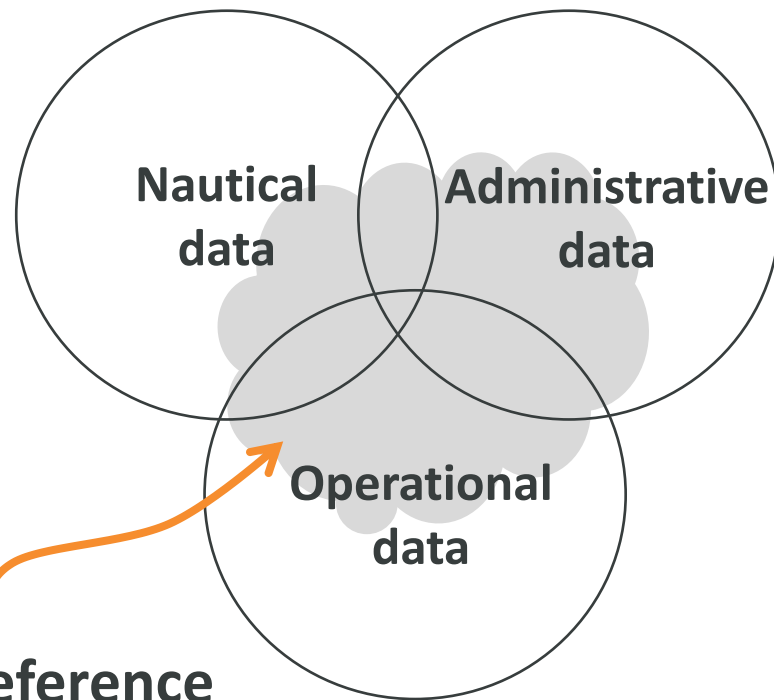
Facilitation milestones



A new focal point: The IMO Compendium



Initial contributors



IMO Reference
Data Model

Key sources of data

- The FAL Forms
- Maritime Declaration of Health
- Stowaways
- Waste reporting
- Just in Time arrival
- Ship Certificate list
- Mandatory Ship Reporting System
- Ballast water reporting
- PSC Inspection History Data
- Noon Data Report
- ...
- Environmental emission reporting
- Electronic Bills of Lading (simple)

What kind of data?



Ship (integrated) data

- BIG data
- Ship specific data exchange
- Sensor readings
- Fuel consumption
- Exhaust gas temperatures
- “Autonomous ship” data
- ...



Nautical data

- Nautical charts/publications
- Port depths and port infrastructure
- Safe and sustainable berth to berth navigation
- E-Navigation
- IMO Maritime Services
- Route exchange
- ...



Operational data

- Arrival and departure times at berth and pilot boarding place
- Starting and completion times of ship and cargo services
- Just-in-time information
- ...



Administrative data

- IMO FAL Convention to exchange FAL data electronically
- Port facility data in IMO GIS
- Maritime Single Window
- Mandatory reporting obligations
- ...

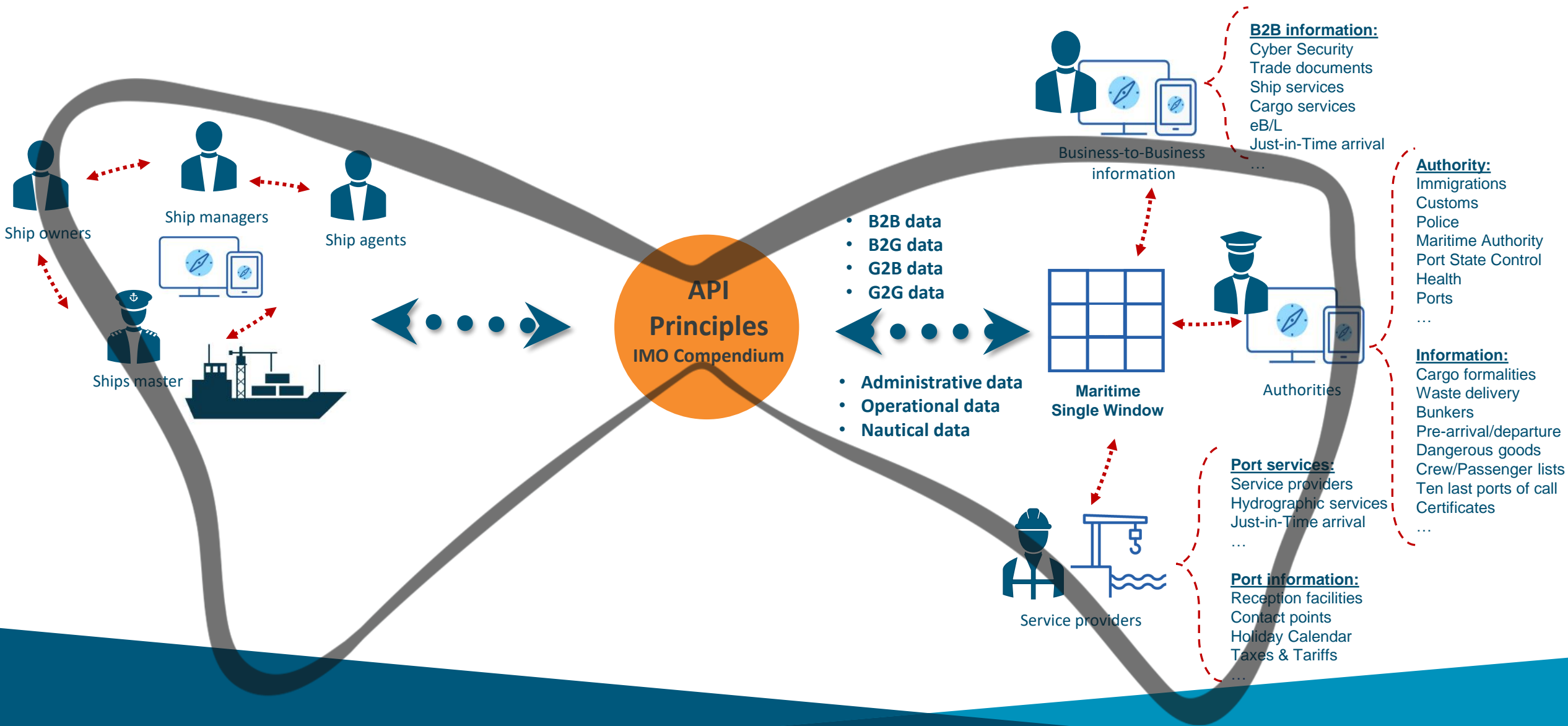


Business-to-business data

- Cyber Security
- Trade documents
- Ordering of ship and cargo services
- eB/L
- ...

Maritime Single Window concept

One solution – may fit the most



Outlook

- The digital transformation is set to play a **vital role** in shipping and for shipping companies
- **Harmonisation and interoperability** are key to the success for resilient, sustainable maritime digitalisation – in particular with regard to the exchange of information/data
- There is a heavy **drive towards maritime digitalization**, but too many **uncoordinated initiatives**
- Global and robust standards and collaboration will ensure **digitalisation and integration**
- There is a need for **smarter collaboration** to enhance operations, satisfy clients' expectation of transparency and predictability and respond to societal concerns
- Ensure **interoperability between public and private systems** for the exchange of logistics information. The IMO Reference Data Model may be used to **leverage cooperation**.

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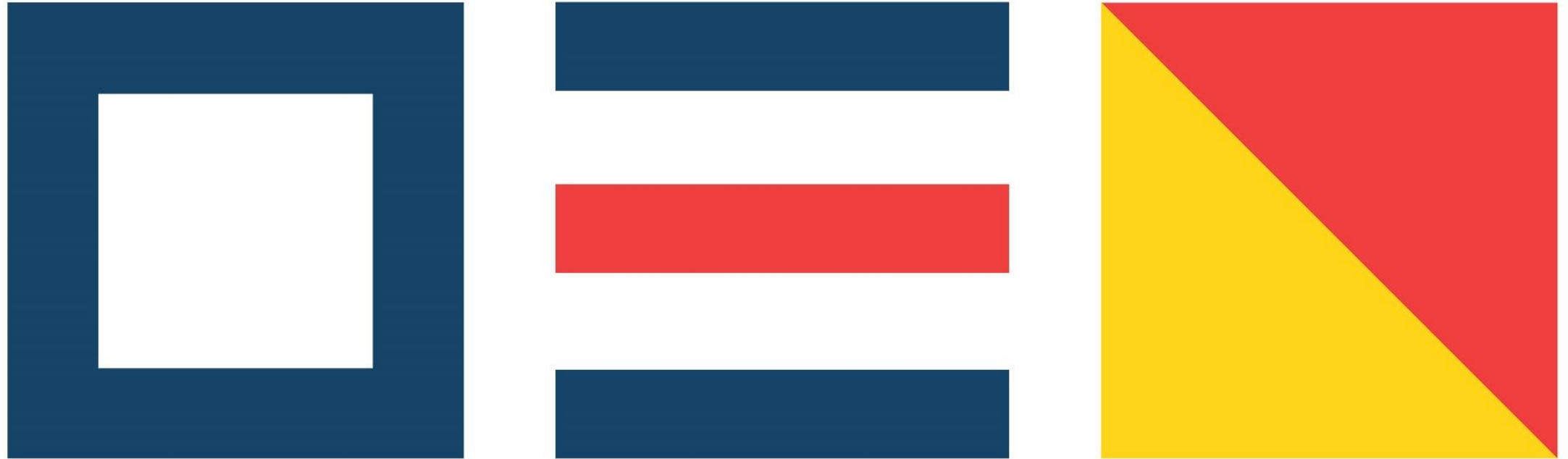
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DIGITALISATION in Maritime Shipping

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International Taskforce



Port Call Optimization

Who is International Taskforce Port Call Optimization?

The Taskforce:

- Started in January 2014
- Comprises subject matter experts with hands on expertise in shipping, ports and standards
- Works together with Non-Governmental Organizations to make submissions to robust standardization bodies to improve and formalize existing industry practices
- Works together with other PCO initiatives
- As a neutral body, consults but does not promote solution providers

INTERNATIONAL TASKFORCE PORT CALL OPTIMIZATION

Industry partners; shipping and agents			
 CMA CGM Line and Agency	 Inchcape Shipping Services	 Maersk	 MSC Mediterranean Shipping Company S.A and Agency
 Oldendorff Carriers	 Shell	 Torm	 Vopak Agents
Industry partners; ports		Standard partners	
 Port of Algeciras	 Ports of Auckland	 Port of Busan	 Port of Gothenburg
 Port of Houston	 Port of Ningbo Zhoushan	 Port of Rotterdam	 Port of Singapore
 Port of Tanger Med	 Hamburg Vessel Coordination Center	 GS1	
 UK Hydrographic Office			
ENDORSERS			
 BIMCO	 Chainport	 Dry Bulk Terminals	 Green Award Foundation
 IALA	 International Association of Ports and Harbours	 International Cargo-Handling Coordination Association	 International Chamber of Shipping
 International Federation of Ship's Masters' Associations	 International Hydrographic Organization	 INTERCARGO	 Lloyd's List Intelligence
 International Harbour Masters Association	 Lloyds Marine Intelligence Unit	 MarineTraffic	 NAVELINK
 PortXchange	 Sea Traffic Management	 The Nautical Institute	 UK P&I Club is managed by Thomas Miller

Why did we start? 2014



RESOLUTION MEPC.323(74)
(adopted on 17 May 2019)

**INVITATION TO MEMBER STATES TO ENCOURAGE VOLUNTARY COOPERATION
BETWEEN THE PORT AND SHIPPING SECTORS TO CONTRIBUTE TO REDUCING
GHG EMISSIONS FROM SHIPS**

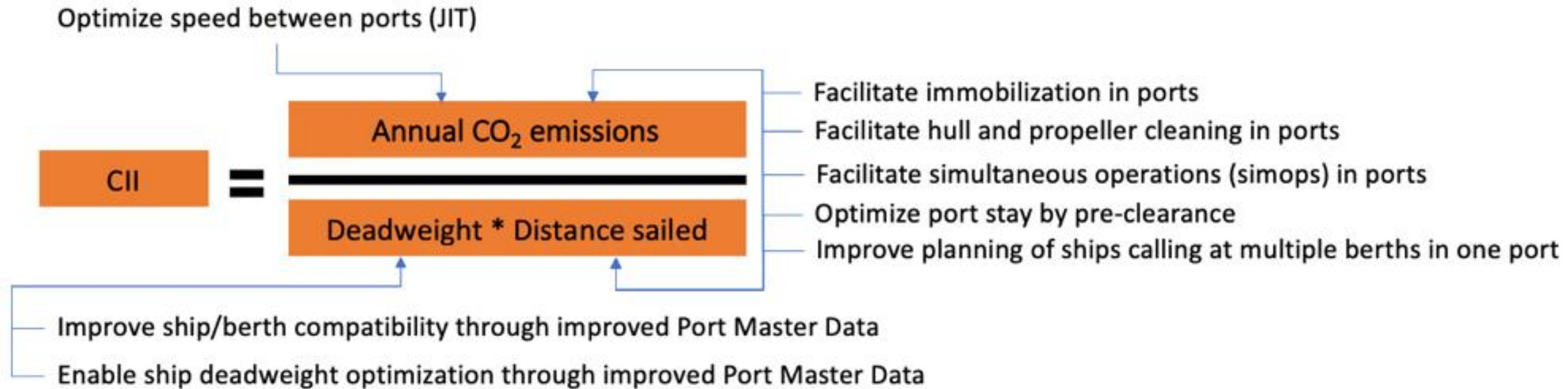
THE MARINE ENVIRONMENT PROTECTION COMMITTEE,

RECALLING Article 38(a) of the Convention on the International Maritime Organization concerning the functions of the Marine Environment Protection Committee conferred upon it by international conventions for the prevention and control of marine pollution from ships,

HAVING ADOPTED resolution MEPC.304(72) on the *Initial IMO Strategy on reduction of GHG emissions from ships* (hereinafter the Initial Strategy),

NOTING that the Initial Strategy calls for the encouragement of port developments and activities globally to facilitate reduction of GHG emissions from shipping, including provision of ship and shoreside/onshore power supply from renewable sources, infrastructure to support supply of alternative low-carbon and zero-carbon fuels, and to further optimize the logistic chain and its planning, including ports,

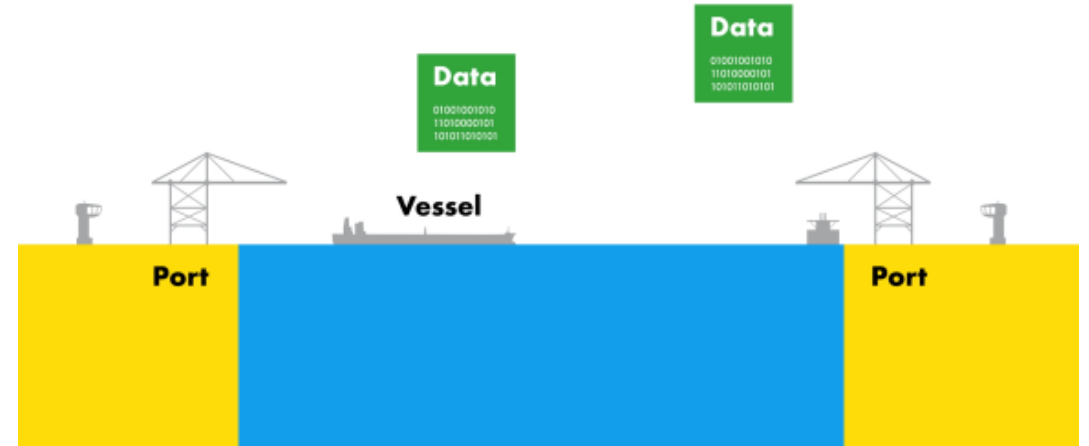
Why did we start? 2023



What is the scope of port call data?

Focus: movement of the vessel:

- Realizing safe and sustainable berth to berth navigation
- Important for shipping, shippers, terminals and ports



Related: movement of the vessel's cargo:

- Realizing reliable and sustainable end to end supply chain
- Important for shippers





A small scope is already a big effort: basics and compliance first!

Nautical data

- a) Port depths
- b) Port infrastructure
- c) Port information

Operational data

- a) Arrival / Departure times at berth and pilot boarding place
- b) Starting / Completion times of vessel and cargo services

Administrative data

- a) IMO FAL forms data

Why is a data owner important?

- Port call data from data owner is up to date and validated during daily operations and can be verified
- Data owner may be different per port



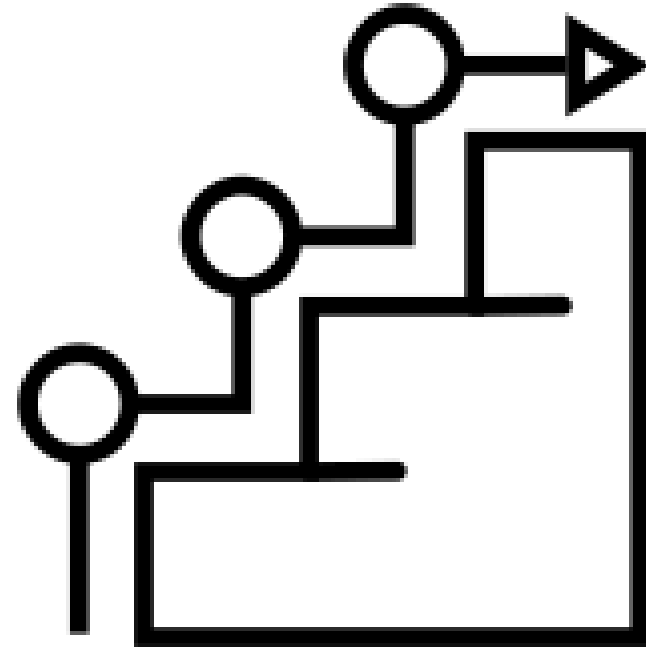
Why is a global approach important?

- Data owners like to share data one to many globally, to minimize administrative burden, errors and delays in updates
- Ports sharing data one to many: they can receive up to 98.000 (2) different ships
- Shipping sharing data one to many: they operate in a global network of up to 8.000 (1) different ports



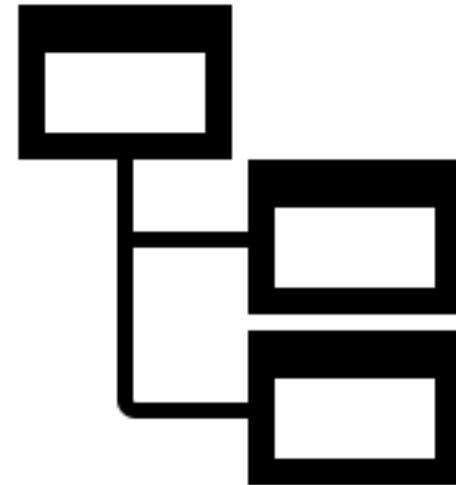
Why is step by step implementation important?

- Many ports and terminals use national / local / company standards for many years; switching over to international standards cannot happen overnight
- A first step is to have the data in international standards, but the information in local standards
- Again: a small step is already a big effort!



Why are non-technical standards important?

- For harmonized communications between humans
- Do we use the same definition for berth or arrival time



Why are technical standards important?

- For electronic exchange of data between computers
- Do we use the same API specifications



Demo at IMO FAL 49 of Digital Shipping Corridor

Showing standards can work between ports:

- Nautical data
- Operational data
- Administrative data



Data standards of demonstration

Nautical data



- Nontechnical: IHO Registry
- Technical: based on S-131

Operational data



- Nontechnical: IMO Compendium
- Technical: based on ISO 28005

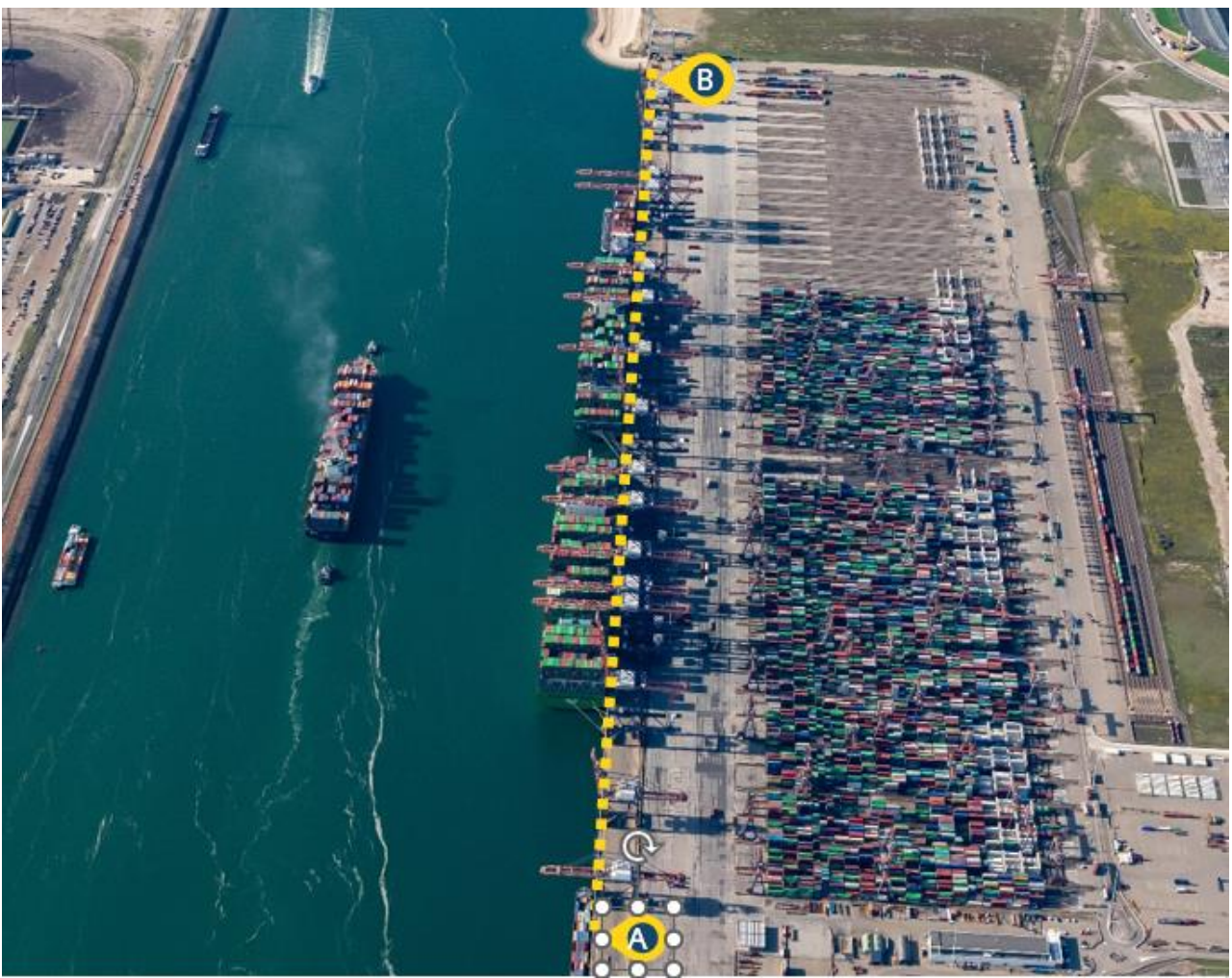
Administrative data



- Nontechnical: IMO Compendium
- Technical: based on ISO 28005

Nautical data - Berth

```
“berths”: [{  
  “gln”: “871933164764”,  
  “name”: “DS QUAY”,  
  “type”: “fender berth”,  
  “coordinateA”: {  
    “latitude”: 51.974834,  
    “longitude”: 3.986750  
  },  
  “coordinateB”: {  
    “latitude”: 51.95644195,  
    “longitude”: 3.995982  
  }  
}]
```



Preliminary format to test information flows

Operational data – ETA/PTA/ATA, ETD/PTD/ATD

“ETA”: 2019-10-12T07:20:50.52Z

“ETD”: 2019-10-12T07:20:50.52Z

“ATA”: 2019-10-12T07:20:50.52Z

“ATD”: 2019-10-12T07:20:50.52Z

“PTA”: 2019-10-12T07:20:50.52Z

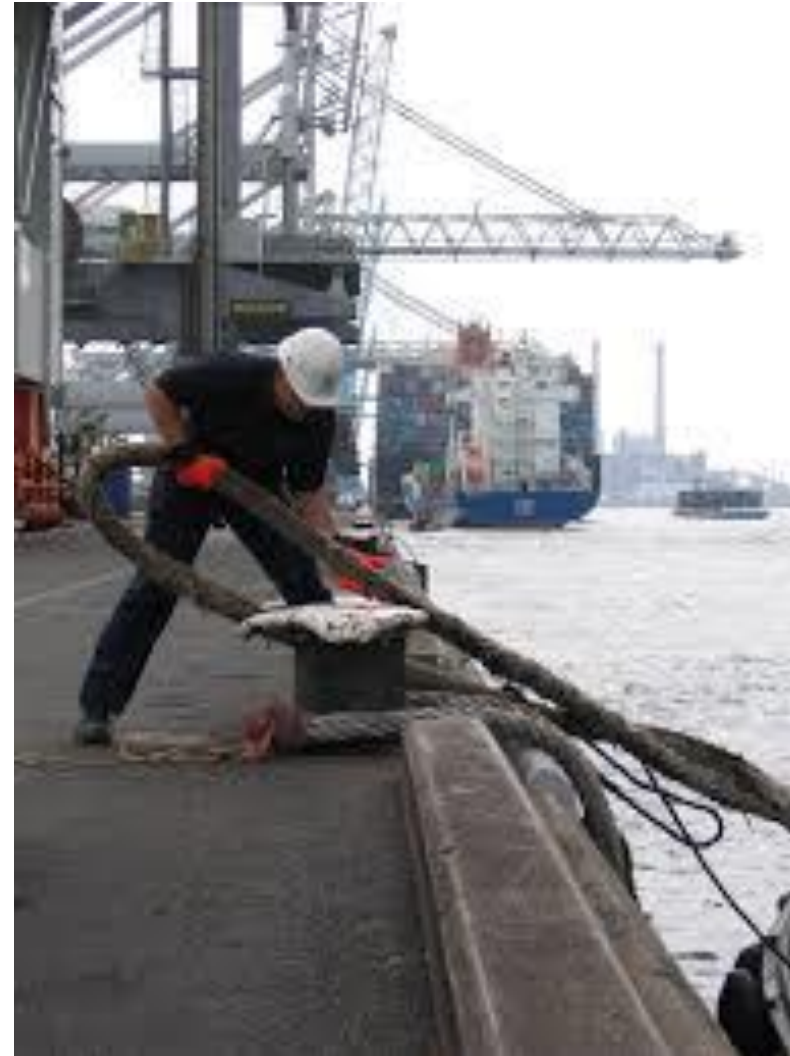
“PTD”: 2019-10-12T07:20:50.52Z

“vslIMO”:"9123456",

“port”:"SGSIN",

“portCallID”:"abc123”

Preliminary format to test information flows



Administrative data – IMO FAL 1

"lastPort" : "Singapore",
 "lastPortC" : "SGSIN",
 "nextPort" : "Singapore",
 "nextPortC" : "SGSIN",
 "crewPax" : 3,
 "passPax" : 1,
 "arrivalPort" : "Singapore",
 "arrivalPortC" : "SGSIN",
 "seqNum" : 1,
 "departurePort" : "Singapore",
 "departurePortC" : "SGSIN",
 "prevPortFacilityStartDate" : "31/02/23T12:02:22",
 "prevPortFacilityEndDate" : "31/02/23T12:02:22",
 "prevPort" : "Singapore",
 "prevPort" : "SGSIN",

Preliminary format to test information flows

IMO GENERAL DECLARATION (IMO FAL Form 1)

		<input type="checkbox"/> Arrival <input type="checkbox"/> Departure
1.1 Name and type of ship		1.2 IMO number
1.3 Call sign		1.4 Voyage number
2. Port of arrival/departure		3. Date and time of arrival/departure
4. Flag State of ship	5. Name of master	6. Last port of call/Next port of call
7. Certificate of registry (Port; date; number)		8. Name and contact details of ship's agent
9. Gross tonnage	10. Net tonnage	
11. Position of the ship in the port (berth or station)		
12. Brief particulars of voyage (previous and subsequent ports of call; underline where remaining cargo will be discharged)		
13. Brief description of the cargo		
14. Number of crew	15. Number of passengers	16. Remarks
Attached documents (indicate number of copies)		
17. Cargo Declaration	18. Ship's Stores Declaration	21. The ship's requirements in terms of waste and residue reception facilities
19. Crew List	20. Passenger List	
22. Crew's Effects Declaration (only on arrival)	23. Maritime Declaration of Health (only on arrival)	
24. Date and signature by master, authorized agent or officer		

T

How does this align with IMO objectives?

Consistent with IMO strategic direction 5:

- Electronic exchange of relevant information
- International consensus on reducing, simplifying and standardizing the information required with global solutions



Moving forward - IMO

Focus on Less Developed Countries



E

4 ALBERT EMBANKMENT
LONDON SE1 7SR
Telephone: +44 (0)20 7735 7611 Fax: +44 (0)20 7587 3210

Circular Letter No.4860
2 April 2024

To: All IMO Member States

Subject: **Call for Expressions of Interest for support from the IMO Global Industry Alliance to Support Low Carbon Shipping (Low Carbon GIA) towards enabling Just In Time sailing of ships**

1 The Global Industry Alliance to Support Low Carbon Shipping (Low Carbon GIA) is seeking to provide support to a selected developing country port, towards enabling Just In Time (JIT) sailing of ships.

2 The Low Carbon GIA is a public-private initiative that brings together maritime industry leaders to support an energy efficient and low carbon maritime transport system. It operates under GreenVoyage2050, an IMO-led initiative which is supporting developing countries to reduce GHG emissions from shipping through supporting implementation of the IMO GHG Strategy (resolution MEPC.377(80)) and resolution MEPC.366(79) encouraging voluntary cooperation between the port and shipping sectors to contribute to reducing GHG emissions from ships.

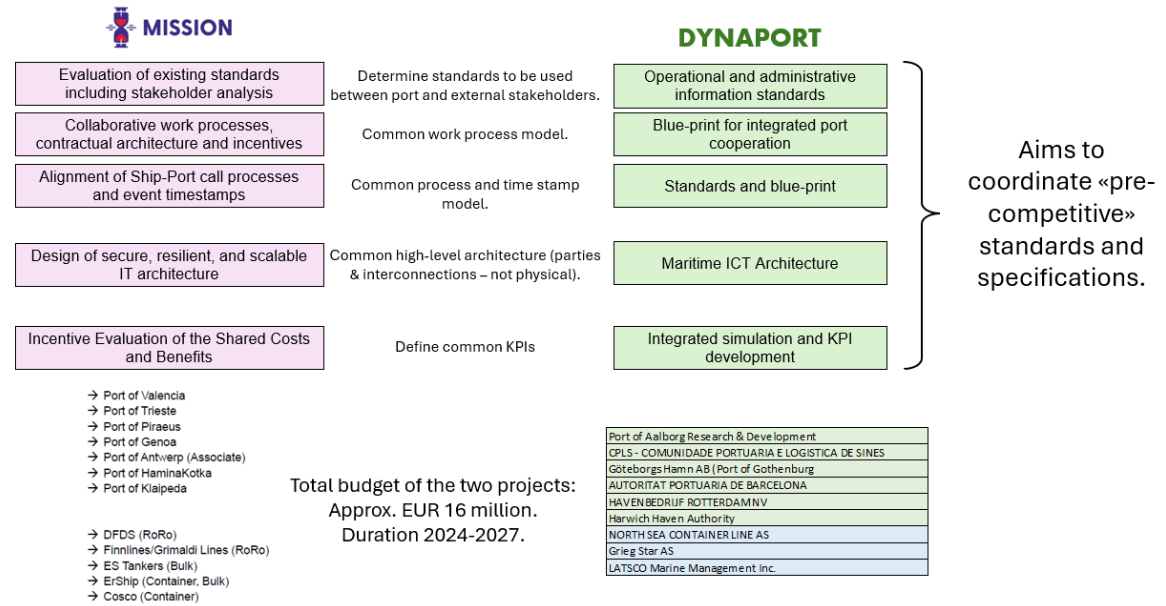
3 The Low Carbon GIA, through its Ship-Port Interface workstream, has been working on developing tools and guidance to support implementation of Just In Time sailing for several years, including the development of a Just in Time Arrival Guide (greenvoyage2050.imo.org/wp-content/uploads/2021/01/GIA-just-in-time-hires.pdf), and [JIT Portal](#) compiling multiple related resources in one place.

4 JIT arrival allows a ship to maintain the optimal ship operating speed to arrive at the Pilot Boarding Place when the availability of: 1. berth; 2. fairway; and 3. nautical services (pilots, tugs and linesmen) is ensured. In this way, the ship arriving can save on fuel and, as a result, emissions, without increasing the overall length of the voyage. This operational improvement also reduces waiting time and congestion in and around the port area, thereby reducing emissions and improving safety.

5 However, while conceptually simple, implementation of JIT sailing is more complex and requires the engagement and commitment of many stakeholders within the port community. One pre-requisite for JIT sailing is the sharing of operational data in real-time.

Moving forward - EU

Focus on European Ports



Moving forward – Coordinate work with all initiatives

May 21 2024 - IHMA congress:

- What are your key challenges for Just In Time?
- What support do ports need?

July 3 2024 - PCO Initiatives meeting:

- What are the key challenges of ports for Just In Time?
- Which initiative can take the lead to address them?

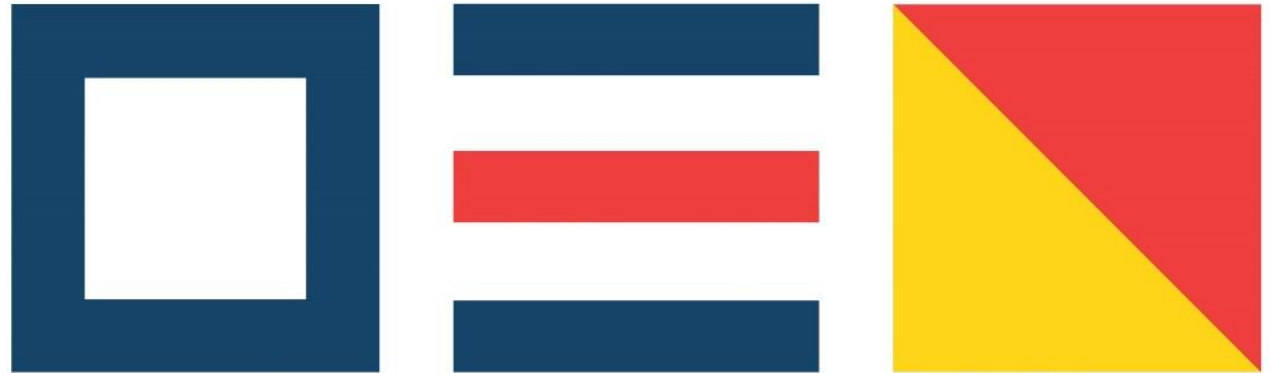
November 2024 – IMO GIA publication:

- Based on Just In Time Arrival Guide
- Implementation Guide based on hands on expertise



Thank you!

International Taskforce



Port Call Optimization



LOSS PREVENTION

PERSONALISED RISK SERVICES



Q&A

FOR MORE INFORMATION: lossprevention@tindallriley.com



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