Digital exchange between ship and shore

**Ship services**
- Charts Routing Class
- Clearance
  - Maritime Single Window
  - Cargo clearance

**Port operations**
- Port Community Systems
- Terminals
- Harbour master
- Port services

**Fairways and port approach**
- Aids to Navigation
- VTS
- Mandatory Reporting System

**At sea**
- Manager Charterer
  - AIS Satellite
- Other ships

**Ship “integrated” data**
- Ship sensor readings
- BIG data
- Operational data collection

**Ship operations**
- Charts Routing Class
- Mandatory Reporting System
- Operational data collection
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)
World Bank endorsement

• The impact of maritime digitalisation would extend far beyond the maritime sector. However, progress has been slow and uneven.

• The World Bank emphasises the importance of unified measures and actions to improve the resilience of the maritime logistic chain especially with regard to digitalisation and the ship-port interface data elements.

• To work through the various stages of digitalisation, actors across the maritime supply chain need to do a lot more than just invest in technology and digital infrastructure.

“A successful digital transition requires sustained political commitment, adequate regulation, effective collaboration between the public and private sectors, along with a concerted effort on education and skills training.”

Source: World Bank report, August 2020
Implementation, milestones

- **2020**
  - Mandatory regulation for public authorities to assist electronic ship clearance processes, 2019

- **2023**
  - ISO 28005-2 Ed. 2, electronic port clearance (EPC), core data elements released in 2021

- **2025**
  - European Maritime Single Window environment (EMSWe) fully implemented by 2025
  - ISO 28005-1, Electronic port clearance (EPC) — Message structures expected by 2023

- **2030**

**Timeline**

- IMO Facilitation Committee (FAL) adopted in 2016 requirements for electronic data exchange
- IMO FAL, IMO eCompendium data set includes app. 500+ data elements, Spring 2022
- IMO Facilitation Committee (FAL) adopts digital FAL declaration forms to be used by 1 Jan 2024
- IMO reference data model to harmonise standards for ship clearance. First version 2020
- ISO 28005-2 Ed. 2, electronic port clearance (EPC), core data elements released in 2021
- ISO 28005-3, Technical standard, administrative and operational data expected by 2023
- Launch of digitalOCEANS™ Port Clearance API Specifications for IMO FAL declaration forms, 2021
- ISO 28005-1, Electronic port clearance (EPC) — Message structures expected by 2023
A new focal point: The IMO Compendium

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
- ...

Initial contributors
Harmonizes data elements between domains

Agreed on common definitions

Growing number of contributors

International Standards

Nautical data

Administrative data

Operational data

- Ship reporting area
- ISPS Facility Code
- Name of ship master

Bollard ID
IMO Compendium
One solution – may fit the most

Authority:
- Immigrations
- Customs
- Police
- Maritime Authority
- Port State Control
- Health
- Ports
...

Information:
- Cargo formalities
- Waste delivery
- Bunkers
- Pre-arrival/Departure
- Dangerous goods
- Crew/Passenger lists
- Ten last ports of call
- Certificates
...

Port services:
- Service providers
...

Port information:
- Reception facilities
- Contact points
- Holiday Calendar
- Taxes & Tariffs
...

IMO Reference Data Model

 Authorities

 Information:

 Port services:

 Port information:
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 GISIS
- Maritime Single Window
- Mandatory reporting obligations
- ...

Business-to-business data
- Cyber Security
- Trade documents
- Ordering of ship and cargo services
- eB/L
- ...

IMO Compendium
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

- 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
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