Harmonised Data modelling and Chart user perspective

BIMCO

2019
Harmonized Data modelling

• EU project paved the way towards the BIMCO focus on Harmonized Data modelling

• BIMCO was partner in EfficienSea2 (2015-2018)

  • Budget: **11.5** M Euro
  • Partners: **32**
  • Partner countries: **12**
  • Total work: **1164** man months
Developed by 32 frontrunners
EfficienSea2 project developed 15 end-user services

**Navigation**
- Navigational Warnings and Notices to Mariners
- Weather on Route
- Nautical Charts based on S100 Standards
- Smart Buoy Interaction
- Route Optimisation
- Ice Charts
- Crowd Sourcing of Ice Information
- Route Exchange
- No-go Areas and Comfort Zones

**Arctic**
- Arctic Live Position Sharing
- Arctic SAR Tool
- Space Weather Forecast

**Administration**
- Automated VTS/SRS reporting
- **Automated exchange of port information**

**Emissions**
- Sulphur emission monitoring
Focus on administrative burden

- An administrative requirements imposed by rules and regulation

- High focus over the past 10 years on how to reduce the administrative burdens in shipping

- IMO has concluding an inventory aiming to identify those administrative requirements that are – or have become – unnecessary, disproportionate or even obsolete within its instruments

- The EU-funded project, EfficienSea2 has focus on the administrative burdens
Exchange of information, today.....

• Complex and diversified picture
  • Pre-arrival documents are sent in advance
    o Pre-arrival documents very often have different deadlines for submitting; 72-48-24 hours before arrival,
  • Port documents for the Authority are handed over on arrival
  • Information exchanged between many stakeholders

• The receiving entity, type and template differs from port to port – even within same country and region
BIMCO reviewed reporting obligations
– route from Helsinki, Gdansk, Aarhus, Bremerhaven to Rotterdam

<table>
<thead>
<tr>
<th>Event</th>
<th>Event number</th>
<th>Time</th>
<th>Information</th>
<th>Details</th>
<th>Comments</th>
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<tbody>
<tr>
<td>1</td>
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<td>Great Belt PreTransit</td>
<td>VTS</td>
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<td>Port State Control information</td>
<td>Notification for ships eligible to expanded inspections</td>
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<td>VTS</td>
<td>Notification</td>
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<td>Garbage removal form</td>
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<td>ETA-24 hours to ETA</td>
<td>Notification for ships arriving in and departing from ports of the EU</td>
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<td>Border checks on persons</td>
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<td>Dangerous Goods</td>
<td>Notification of dangerous or polluting goods carried on board</td>
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<td>Notification of dangerous or polluting goods carried on board</td>
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<td>Entry summary</td>
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<td>12 miles zone</td>
<td>Immigration</td>
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<td>Health</td>
<td>Health Documents or Certificate</td>
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<td>Passenger effects list</td>
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<td>Crew change information</td>
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<td>Storage</td>
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<td>Ship’s</td>
<td>Ship’s stores list</td>
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<td>12 hour zone</td>
<td>Storage list</td>
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<td>Visitors</td>
<td>List of visitors during the port of call</td>
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<tr>
<td>30</td>
<td>Passenger</td>
<td>Passenger arrival list</td>
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<tr>
<td>31</td>
<td>Goods</td>
<td>Goods list</td>
<td></td>
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</tr>
</tbody>
</table>

The E2 use case identified 150+ reporting requirements! for 4 ports
International regulation on reporting

- IMO Facilitation Committee (FAL) adopted in 2016 new requirements for electronic data exchange

- New mandatory regulation requires public authorities to establish systems to assist ship clearance processes by April 2019

- For international shipping, a unified, global approach to facilitation of international maritime traffic is vital
The E2 solution on information exchange

• End-user focused e-solution

• Based on realistic use cases

• Open source, platform to platform solution (M2M)

• Harmonized data model (UN/CEFACT, WCO, ISO28005, ...)

• Safe and (cyber) secure transfer of data

• Transparent and measurable solution (admin burden)
The structure of data

Data model

Data clusters

- Data element 1
- Data element 5
- Data element 4

Data clusters

- Data element 1
- Data element 2
- Data element 3
Simplified illustration of the solution

EfficienSea2
by Service Provider xx

API

BIMCO port database

Authority:
- Immigrations
- Customs
- Police
- Maritime Authority
- Port State Control
- Health
- Ports
E2 – solution where $1 + 1 = 3$

- a flexible “micro” service specification, combined with
- an international maritime data element model, with common definitions
STANDARDS – STANDARDS – STANDARDS…..

- **Harmonisation** is critical, use of **international standards** is key and leads to **interoperability**

- Use of a suitable data model, mapped across main models (e.g. UN/CEFACT Multimodal Reference Data Model, WCO Data Model and ISO)

- The e-solution shall be **technology neutral**, and provide the ability to adapt to new technologies (backwards and forwards compatible)

- M2M solution, no need for additional systems/equipment
Common maritime data model

Key sources
- IHO S-100 framework data set
- IMO FAL compendium data set
- IALA port call message standard data set
- IHMA nautical port information data set
- ISO 28005-2 data set, comprises also:
  - WHO maritime health declaration
  - IMO data on safety and environmental matters
- ...  

Key source
- UN/CEFACT data set
- ...  

Key source
- WCO data set, comprising UN/EDIFACT
- ...  

Where overlap between the data models exists, there is a need for associating the data definition with multiple data element ID’s.
What are the obstacles....

• Need for common data element’s ID standard

<table>
<thead>
<tr>
<th>Data element</th>
<th>Description</th>
<th>Data element ID’s</th>
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</thead>
<tbody>
<tr>
<td>Ship name</td>
<td>Given name of the ship in the ship registry</td>
<td>ShipID.ShipName C222:8212 (Name of ship) T005 SHIP_Name</td>
</tr>
<tr>
<td>Call sign</td>
<td>Call sign for the ship. Sequence of letters and numbers, unique to each ship</td>
<td>ShipID.CallSign C076:3148 (call sign) Type (253) SHIP_Call_Sign</td>
</tr>
<tr>
<td>IMO number</td>
<td>Unique ship identification number assigned by Lloyd’s Register – Fairplay in</td>
<td>ShipID.IMONumber C222:8213 (IMO Number) T006 SHIP.IMO_Number</td>
</tr>
<tr>
<td>MMSI number</td>
<td>Identifier used by maritime digital selective calling (DSC), automatic identification systems (AIS) and certain other equipment to uniquely identify a ship or a coast radio station.</td>
<td>ShipID.MMSINumber Type (253) -</td>
</tr>
<tr>
<td>Comments</td>
<td>Any other information related to ship identity</td>
<td>ShipID.Comment - - - - - -</td>
</tr>
</tbody>
</table>
BIMCO proposal...

Establishment of a **maritime data element register**

- group name, name of data element, definition/description of data element, data type, data element ID/attribute ID, remarks, and parent source

If there is an overlap between different data sets, the alternative element ID(s) and the associated source should also be listed.

- alternative data element ID(s), and alternative source(s).
Outlook

• At FAL 42, 2018, BIMCO asked the Committee to consider data sets which goes beyond what is requested by the FAL Convention (pre-arrival documents)

• At FAL 43, April 2019, BIMCO submit a gab-analysis of data elements which need to be added to the IMO reference data model – capturing WCO, UN/EDIFACT, ISO and FAL Compendium
Positive side effects by having common data sets -

Reduction of the administrative burden

- E2 project have issued a questionnaire asking navigators about time spend to prepare, perform and finish 32 mandatory administrative tasks
  - The average total time to complete the most time consuming tasks is 62 minutes
  - The average total time to complete the least time consuming tasks is 16 minutes
- E2 solution estimate a reduction of 79% of this time
Human error contribution to accidents

Various stats indicate human error contributes to 80% of maritime accidents.
IMO and Standardisation

• The issue was formally put forth to IMO in Jun 2015 at MSC 95
• Number of workshops
• Informal working groups
• Discussed at e-Nav seminars etc.

• In Jan 2018, BIMCO hosted a workshop on S-mode
• At NCSR 5, in Feb 2018, BIMCO co sponsored a paper, where the first draft of guidelines for the Standardised mode of operational of navigational equipment.
• The main area of focus was the human interface of electronic navigation equipment.
Latest developments at IMO

Standardized mode work is now completed at the sub-committee level
Once the work is adopted by MSC, we will move forward to a much more harmonized way.
BIMCO workshop

The workshop was conducted by representative from
1. Western Norway University of Applied sciences
2. Australian Maritime College
3. Australian Maritime safety authority (AMSA)
4. Korean Maritime and Ocean university
5. Institute of Maritime and Fisheries Technology
6. Korean Register of shipping
BIMCO workshop

• On 23 January 2018, BIMCO hosted a workshop on Standardised mode (S-mode).
• A trial test of methods used to gain seafarer’s input on standardisation of e-navigation interfaces as outlined in the IMO submission
• The trial was designed to evaluate the effectiveness of the intended methods to test:
  • the usability of icons
  • the grouping of data on the navigation displays
  • the default settings of navigation systems.
User needs

• Most confusion arises to the user when the same information is presented in different format across different navigation equipment.

<table>
<thead>
<tr>
<th>Essential information blocks</th>
</tr>
</thead>
</table>

**Navigation (Own ship information)**
- COG: <value / sensor status> <unit> | <sensor source>
- SOG: <value / sensor status> <unit> | <sensor source>
- HDG: <value / sensor status> <unit> | <sensor source>
- STW: <value / sensor status> <unit> | <sensor source>
- LAT value> | <LON value> | <sensor source> | <sensor accuracy>

**Date and Time**
- <Date> | <Time> | <Time Zone>

**Route**
- To WPT: <WPT name>
- BRG to WPT/BRG to WOL/Leg Course: <bearing>
- DIST to WPT/DIST to WOL: <distance>
- TTG: <time>
- XTD: <value>
- Radius: <value>
- Next leg course: <value>
Standard profile / User customized profile

• Have one standard profile – that can reached with a single operator function.
• User customized profile – that can be selected by the user.
• Have around 3 or 4 such profiles to ease the navigators
Thank you!

Contact BIMCO at
www.bimco.org

For further information, contact
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