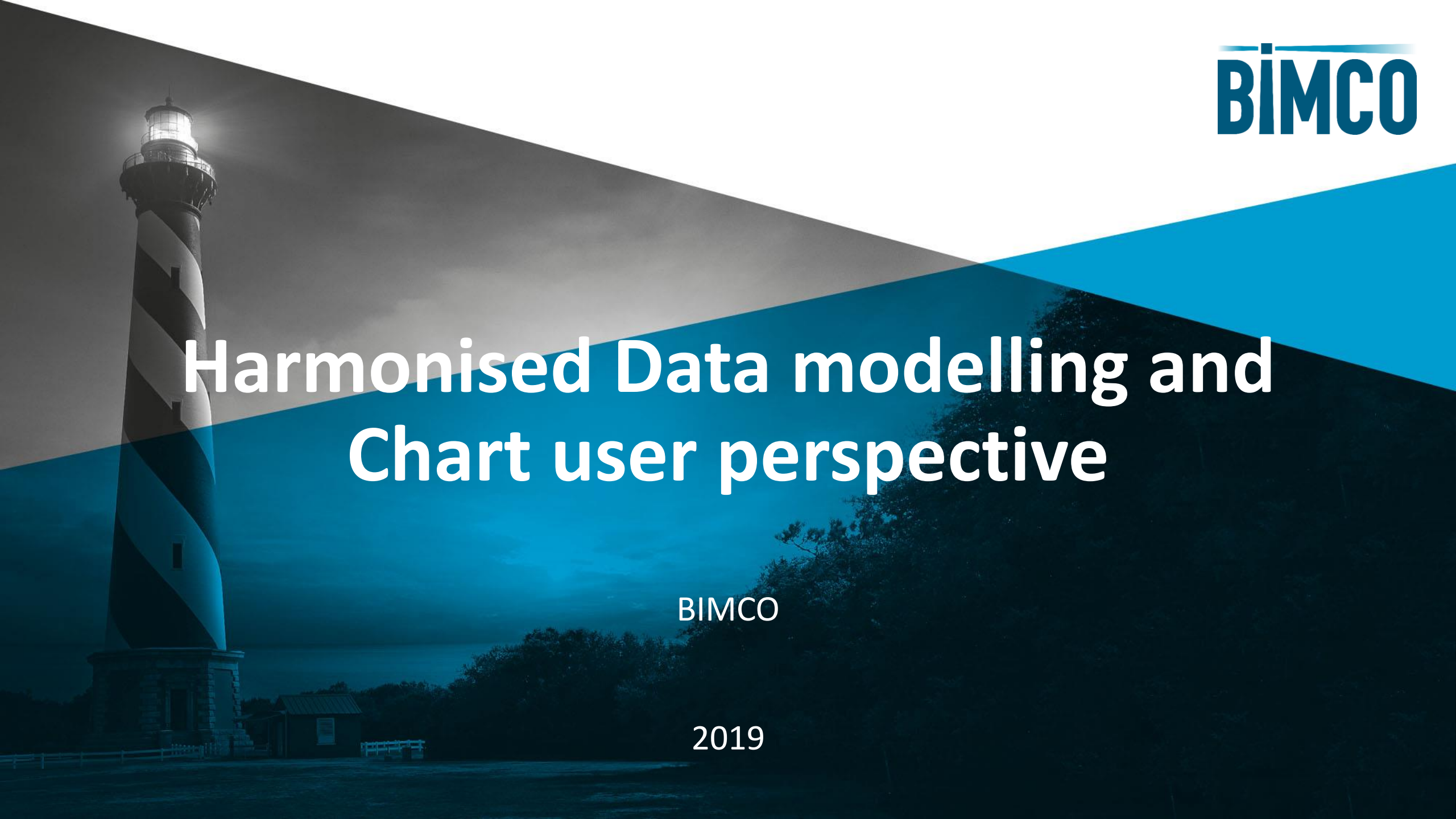


Harmonised Data modelling and Chart user perspective

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)

EFFICIENSEA 2.0 GETTING CONNECTED

- 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
    - 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

En route from Port of Gdansk, Poland calling Port of Aarhus, Denmark							
1		Great Belt PreTransit	VTS				
2	72 hours before arrival	Port State Control information	Notification for ships eligible to expanded inspections		EU-SSN form C3		
3		VTS	Notification				
4	As early as possible		Garbage removal form				
5	24 hrs before arrival	ETA-24 hours to ETA	Notification for ships arriving in and departing from ports of the EU		EU-NSW form A1		
6	24 hrs Pre-Arrival documents	Border Control	Border checks on persons		EU-NSW form A2		
7		Dangerous Goods	Notification of dangerous or polluting goods carried on board		EU-NSW form A3		
8		Dangerous Goods	Notification of dangerous or polluting goods carried on board		IMO FAL form B7		
9		Waste	Notification of waste and residues		EU-NSW form A4	1	
10		Security	Notification of security information including ISPS Certificate		EU-NSW form A5	2	
11		Entry summary	Ship's [illegible] declaration		EU-NSW form A6		
12			International Oil Pollution Prevention (IOPP) Certificate			1	
13			Cargo Manifest			1	
17	Before entering 12 miles zone Immigration	General	General declaration		IMO FAL form B1		
18		Health	Health Documents or Certificate		IMO FAL form B8	1	
19		Customs	Crew arrival list		IMO FAL form B5	2	
20			Crew effects list		IMO FAL form B4	2	
21			Passenger arrival list	(if pax)	IMO FAL form B6	2	
22			Passenger effects declaration	(if pax)		2	
23			Stowaways list			1	
24			List of visitors during the port of call			1	
25			Details of list of consignments which are subject to other customs duties and/or services during the ship's stay			1	
26		Goods which will not be cleared,to be stored in a s	Ship's stores list	(bonded and provision)	IMO FAL form B3	2	
27			Ship's stores list	(deck and engine)	IMO FAL form B3	2	
28			Temporage storage list		EU-NSW form C5		
29			Narcotics and weapons list			2	
30			Ship's cash list			1	
31			Crew change information			1	

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

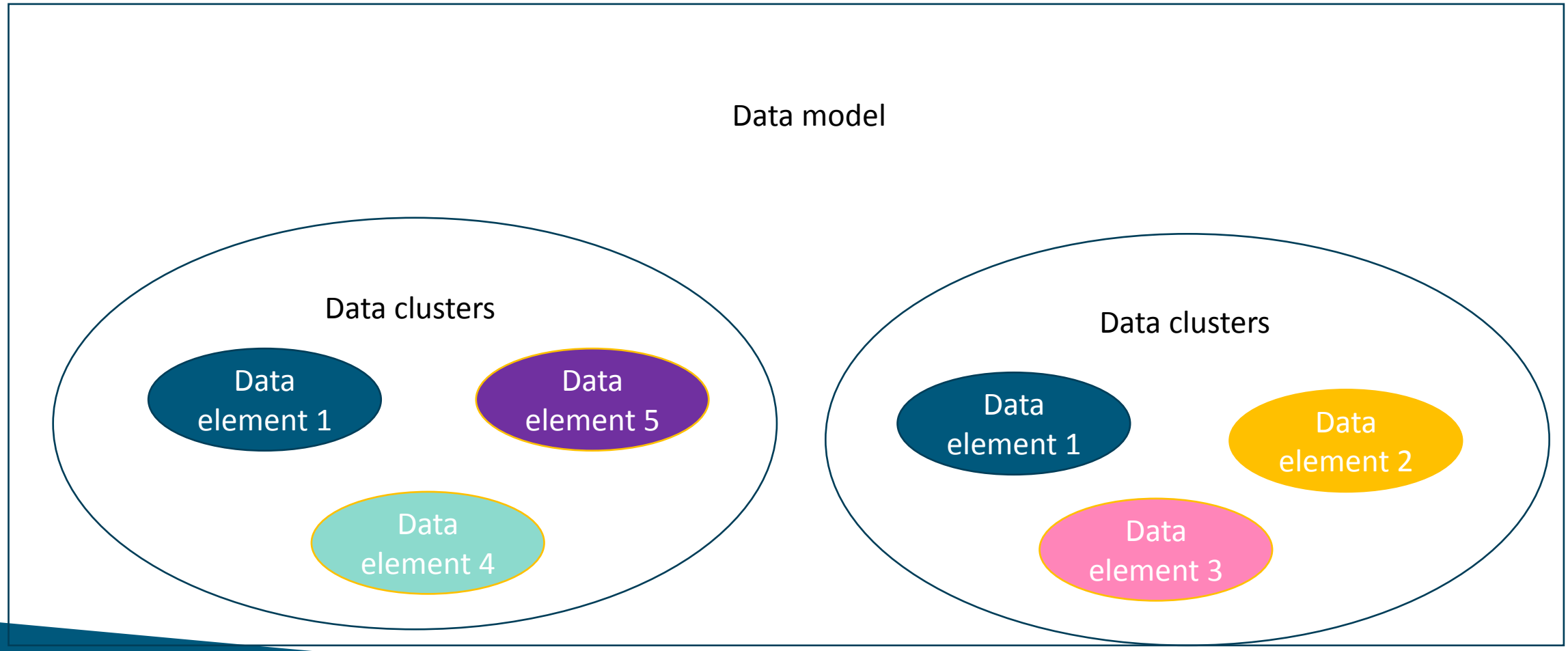
International regulation on reporting

- 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

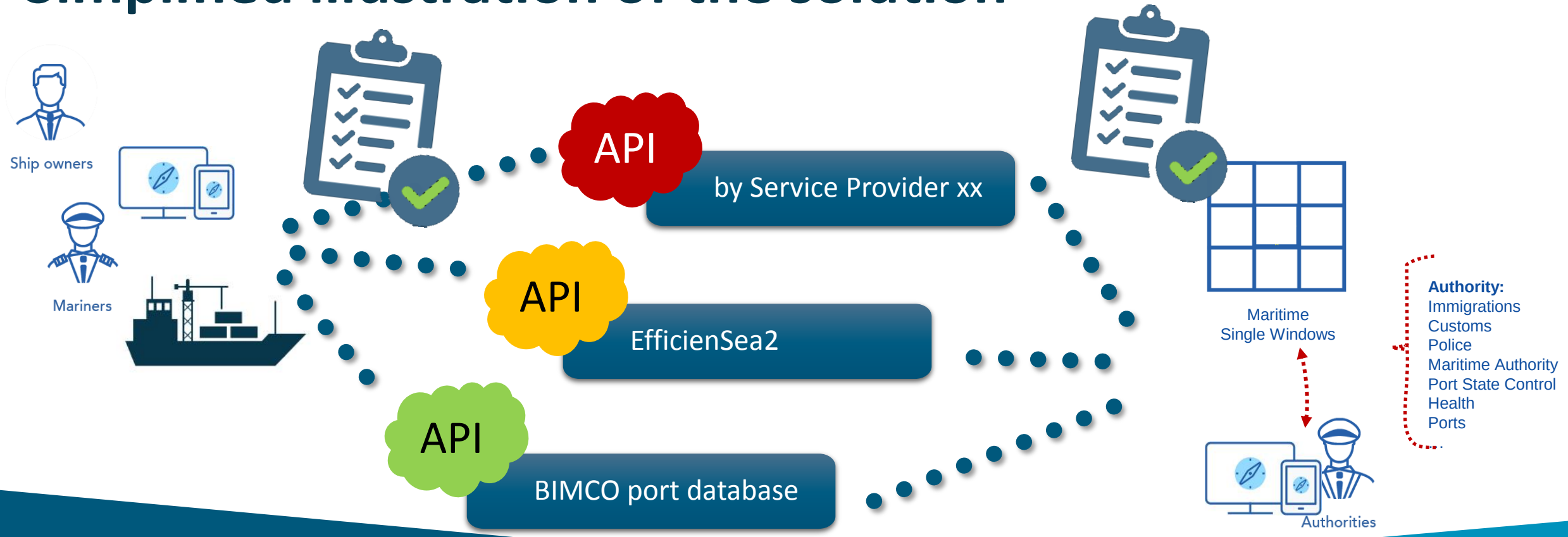
The E2 solution on information exchange

- 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



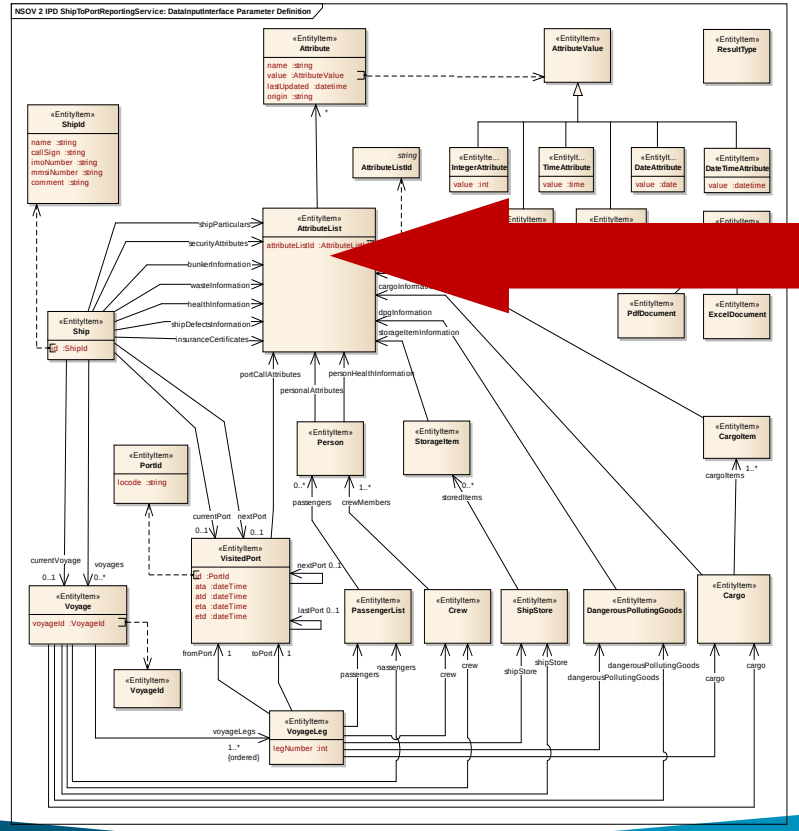
Simplified illustration of the solution



E2 – solution where 1 + 1 = 3

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

Harmonized data modelling



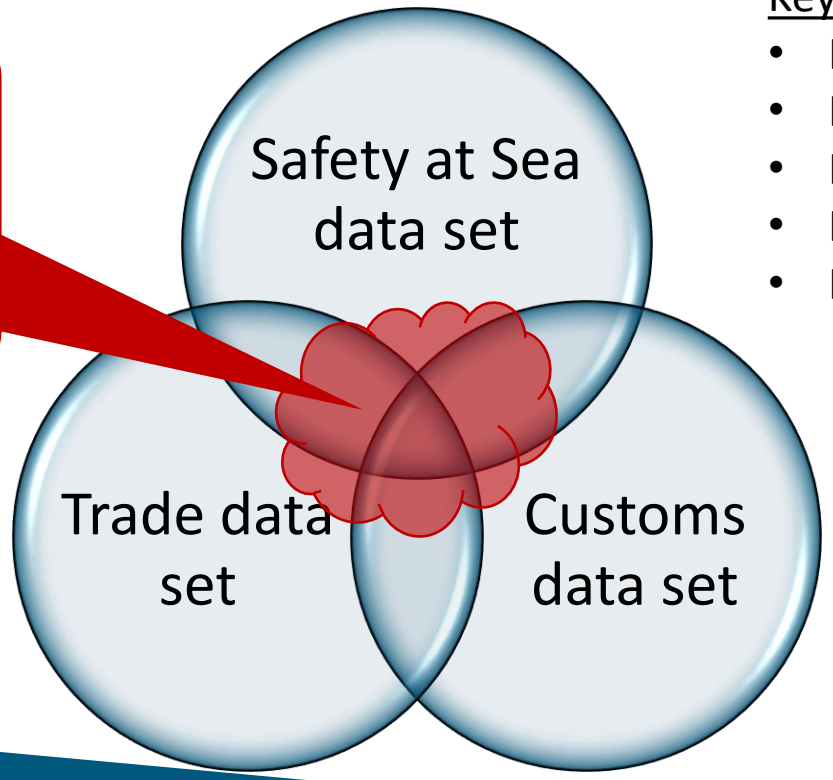
Group/ Element Name	Definition	Type	Draft proposed attributes (subject to changes) (Not exhaustive)
Location of the port			
Port name	Free text	textstring	(subject to changes)
Location	Position - see geo reference		(Not exhaustive)
Global Location Number	Numerical	13 digits	LOCATION_NUMBER
Time zone	Standard Time, UTC -/+ xx hrs	Time	PORT_TIME_ZONE
Position	Always expressed in degrees but representation	Numerical	POSITION
Latitude		Numerical	POSITION_LAT
Longitude		Numerical	POSITION_LONG
Datum	Vertical datums listed in sheet. Horizontal datums		DATUM
General contact information			
Legal disclaimer	Free text	textstring	PORT_LEGAL_DISCLAIMER
General contact information	Free text	textstring	PORT_GENERAL_CONTACT_INFORMATION
Point of contact	Individual name o - free text	textstring	PORT_POINT_OF_CONTACT
Website	Free text	textstring	PORT_WEBSITE
Inter-ship communication	VHF usage - free text	textstring	PORT_INTERSHIP_COMMUNICATION
Cargo	Weight of goods per calendar year in tons	Numerical	PORT_SUM_CARGO
Charts	Name of the chart - free text	textstring	PORT_CHARTS
Shipping announcements	Free text or reference to a port website	textstring	PORT_SHIPPING_ANNOUNCEMENTS
ISPS level	Level 1, 2 or 3	Numerical	PORT_ISPS_LEVEL
Load line	Free text	textstring	SHIP_LOAD_LINE
Local Holidays	Name of the holiday	textstring	PORT_LOCAL_HOLIDAYS
Working hours	Start day	textstring	PORT_WORKING_HOURS
Depth information per section of			
Berth	Spatial area or point		BERTH
Berth status	"ready", "not ready", "operational", "disused",		BERTH_STATUS
Anchor berth	Spatial area or point		ANCHOR_BERTH
Sounding	Decimal Meters, referred to a Chart Datum	Numerical	SOUNDING
Dredged Area	Spatial - Area, depth - meters, referred to a Chart		DREDGED_AREA
Dredging regime	Free text	textstring	DREDGING_REGIME
Overdredge	Decimal Meters	Numerical	OVERDREDGE
Maintained depth	Decimal Meters, referred to a Chart Datum	Numerical	MAINTAINED_DEPTH
Sounding Minimum	Decimal Meters, referred to a Chart Datum	Numerical	SOUNDING_MIN
Sounding Maximum	Decimal Meters, referred to a Chart Datum	Numerical	SOUNDING_MAX
Nature of sea bottom	Formatted text. Options in line with BA chart 5011		NATURE_SEA_BOTTOM
Water density	numeric - Kg/m3 (kilogrammes per cubic metre)		WATER_DENSITY
Minimum Water density	Kg/m3	digit	WATER_DENSITY_MIN
Port information			
Anchorage	Spatial - area or point		ANCHORAGE
Traffic Separation Scheme	Spatial - (Multi) polygon or line - (split into multiple		TRAFFIC_SEPARATION_SCHEME
Deep Water Route	Spatial - line		DEEP_WATER_ROUTE

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

Where overlap between the data models exists, there is a need for associating the data definition with multiple data element ID's



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
- …

What are the obstacles….

- Need for common data element's ID standard

Data element	Description	Data element ID's			
		ISO 28005	UN/EDIFACT	WCO ID	IACS R.75
Ship name	Given name of the ship in the ship registry	ShipID.ShipName	C222:8212 (Name of ship)	T005	SHIP_Name
Call sign	Call sign for the ship. Sequence of letters and numbers, unique to each ship by which ships can be identified usually in radio communications.	ShipID.CallSign	C076:3148 (call sign)	Type (253)	SHIP_Call_Sign
IMO number	Unique ship identification number assigned by Lloyd's Register – Fairplay in accordance with IMO resolution A.600(15).	ShipID.IMONumber	C222:8213 (IMO Number)	T006	SHIP_IMO_Number
MMSI number	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.	ShipID.MMSINumber	-	Type (253)	-
Comments	Any other information related to ship identity	ShipID.Comment	-	-	-
….					

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

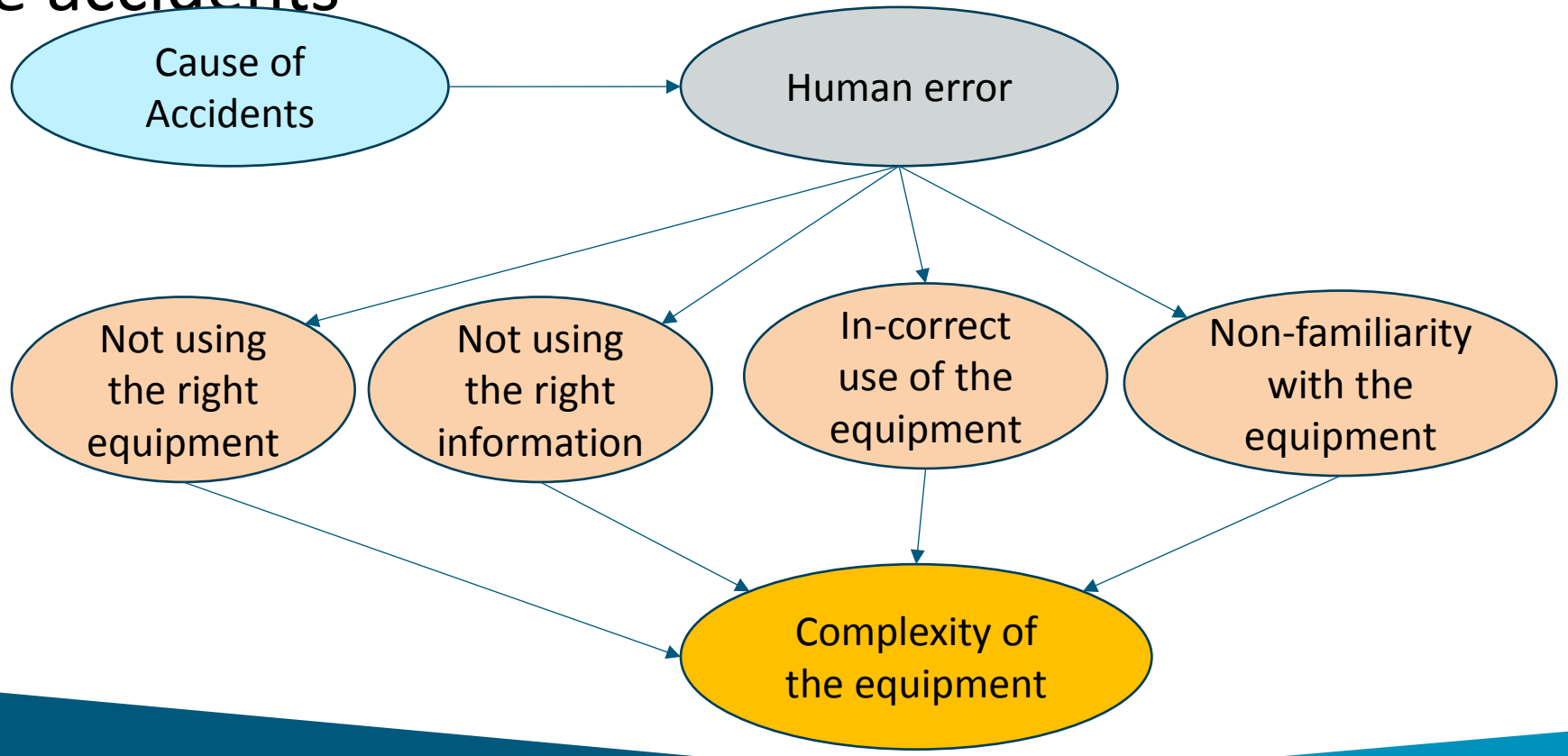
Positive side effects by having common data sets -

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.

Essential information blocks

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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