



The realization of the Maritime Service Portfolios  
by Maritime System Engineering:  
Investigating a Shore Based Bridge Concept by help  
of the eMIR Reference Platform (by OFFIS)

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e-Navigation Underway, January 25th 2018







# Digital Charts & Publications

NavTracker  
NavStick

(+Paper Charts and Publ.)

# e-Navigation solutions

NavTracker  
NavBox  
NavStation  
OEM - Collaboration

## In-house R&D and External Projects



e-Navigation  
Intelligent Ship  
Traffic Management



Development since 2009

M-AR



Horizon 2020  
European Union Funding  
for Research & Innovation



ECSEL Joint Undertaking  
Electronic Components and Systems for European Leadership



# e-Navigation...?

**DEFINITION (IMO MSC);** «The harmonized collection, integration, exchange, presentation and analysis of marine information onboard and ashore by electronic means to enhance berth to berth navigation and related services for safety and security at sea and protection of the marine environment»

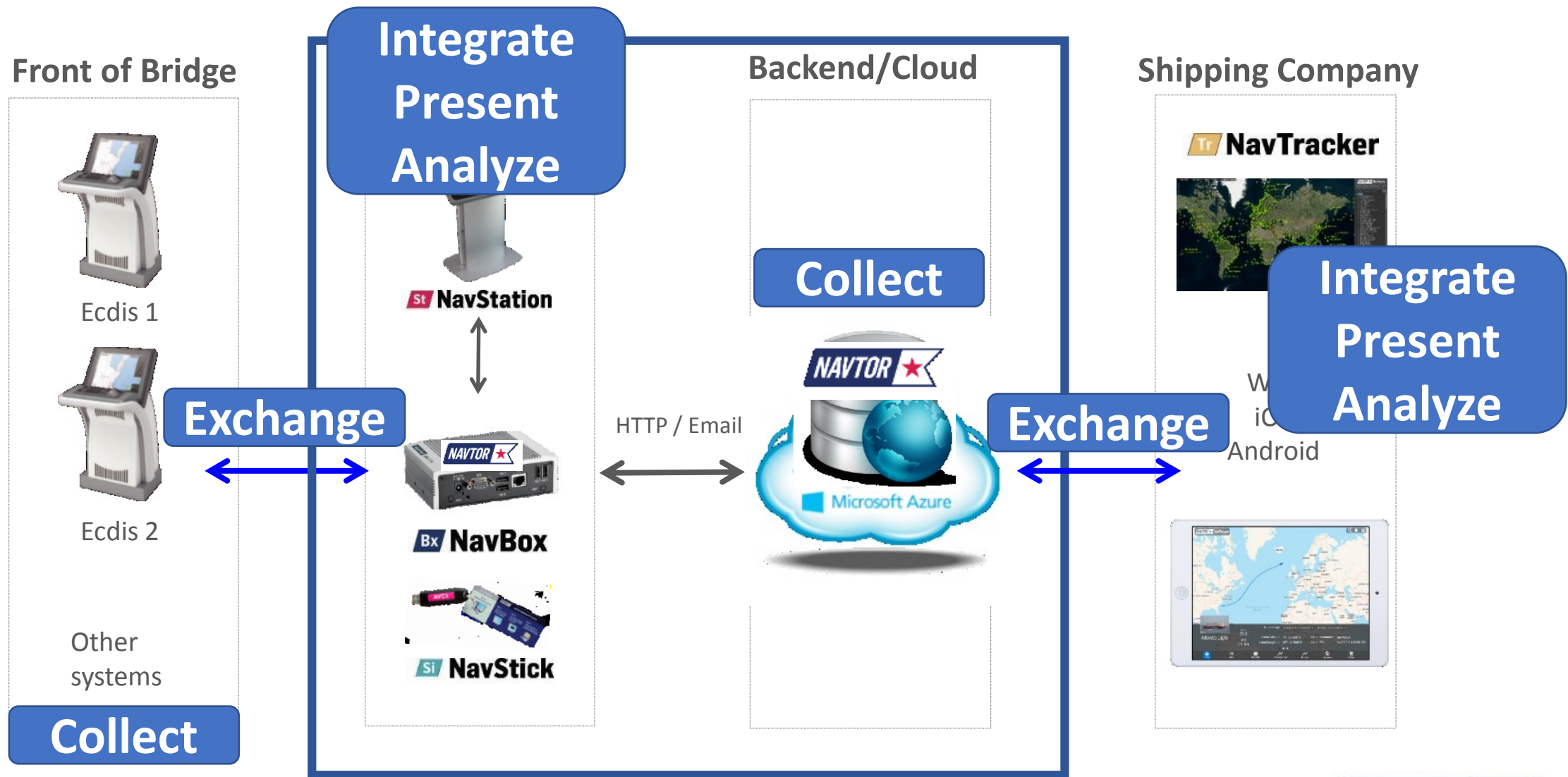
## Collect, Integrate, Present, Analyze and Exchange

Five prioritized solutions..

S4 – **Integration and presentation**  
of available information  
in graphical displays  
received via communication equipment



# e-navigation by NAVTOR



# PP – Section 1

Info from ATT, WP and Port Database

<b>Tides</b> DEPARTURE PORT: H.W. L.W. Not use ATT Time: 07:45 01:52 4.8 Time: 14:15 14:15 4.9 Standard port: ANTWERP (PROF)		<b>Port Database</b> DEPARTURE PORT INFORMATION: Name of berth: Antwerp VHF channel Port Control: 12 VHF channel Pilot: 13 Pre-departure notice to: Antwerp VTS VHF ch. 22 Draught restrictions: Oct 12th: dredging ongoing in Bert entrance All Draught restrictions: 25 Other restrictions: Dredging in channel during night time Change of pilot during outward pilot passage, at WP no. / pos: Guide to Port Entry, vol/page Guide to Port Entry, vol/page	
<b>ATT ADMIRALT</b> ADMIRALT TotalTide Time: 22:09 13:43 0.4 Standard port: Galveston Bay Entrance		<b>ARRIVAL PORT INFORMATION:</b> Name of berth: Houston VHF channel Port Control: 14 VHF channel Pilot: 15 Pre-departure notice to: Houston VTS VHF ch. 23 Draught restrictions: No valid additional restrictions apply All Draught restrictions: 32 Other restrictions: Regatta in Port area Change of pilot during outward pilot passage, at WP no. / pos: Guide to Port Entry, vol/page Guide to Port Entry, vol/page	
<b>COSP/EOSP</b> COMMENCEMENT OF SEA PASSAGE AT WP NO. TIME UTC LOCAL TIME 10 COSP 14.10.2017 10:29 14.10.2017 11:29 END OF SEA PASSAGE AT WP NO. TIME UTC LOCAL TIME 11 EOSP 24.10.2017 15:21 24.10.2017 15:21		Voyage specifications: Commencement Sea passage at WPT no. Time UTC Local time 10 COSP 14.10.2017 10:29 14.10.2017 11:29 End of Sea passage at WPT no. Time UTC Local time 11 EOSP 24.10.2017 15:21 24.10.2017 15:21	
Pilot departure: 476.6 3:14:05 12.6 Sea passage: 4231.4 10:12:01 16.8 Pilot arrival: 298.9 3:18:12 7.1		EMERGENCY ANCHORAGES: No. M/S NAVTOR Route: ANTWERP - HOUSTON, ORG Voyage: 123-2017	

CHARTS AND PUBLICATIONS, NAV. WARNINGS & WEATHER FORECASTS, REPORTINGS

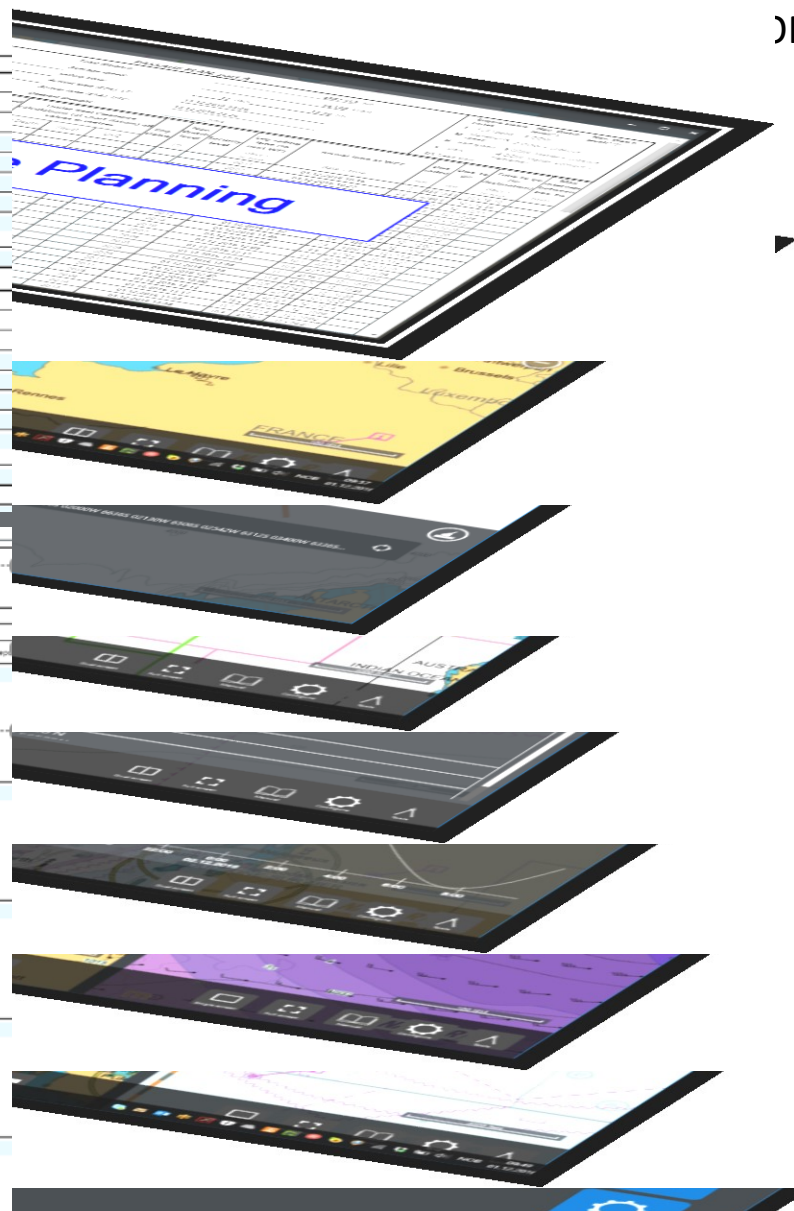
WP No	WP Name	ENC Cells	T & P Notice in force	ADLL Area	ADRS2 Area	ADRS6 Area	ADRS1345 Area	ATT Area	e-NP Sailing Directions	NAVTEX	NavArea Warnings
1	ANTWERP	BESANTWLN, GB2A218Z, NL101014, NL40120E, NL40121E, N01A3000		8, 2	1	1 & 2	1	1-4		Callercasts U/G Den Helder P Nilton JTEK Oostende BTV Ploosberg SS Rogaland L	
2	Schaepsooi	BESANTWLN, GB2A218Z, NL101014, NL40120E, NL40121E, N01A3000		8, 2	1	1 & 2	1	1-4		Callercasts U/G Den Helder P Nilton JTEK Oostende BTV Ploosberg SS Rogaland L	
3		BESANTWLN, GB2A218Z, NL101014, NL301630, NL40120E, NL40121E, N01A3000		8, 2	1	1 & 2	1	1-4		Callercasts U/G Den Helder P Nilton JTEK Oostende BTV Ploosberg SS Rogaland L	
4		BESANTWLN, GB2A218Z, NL101014, NL301630, NL40120E, NL40121E, N01A3000		8, 2	1	1 & 2	1	1-4		Callercasts U/G Den Helder P Nilton JTEK Oostende BTV Ploosberg SS Rogaland L	

# PP – Section 4

Info auto-listed within corridor (XTD)

Planning; utilizing integrated information layers, as well as ECDIS-functionality, to make a SAFE and DETAILED PASSAGEPLAN

- Route planning
- NavArea Warnings
- ADRS; Radio Signals
- ADLL; List of Lights
- ATT; Total tide
- Weather & WX-time series
- ENC Service; PAYS
- Desktop with Maritime APPS

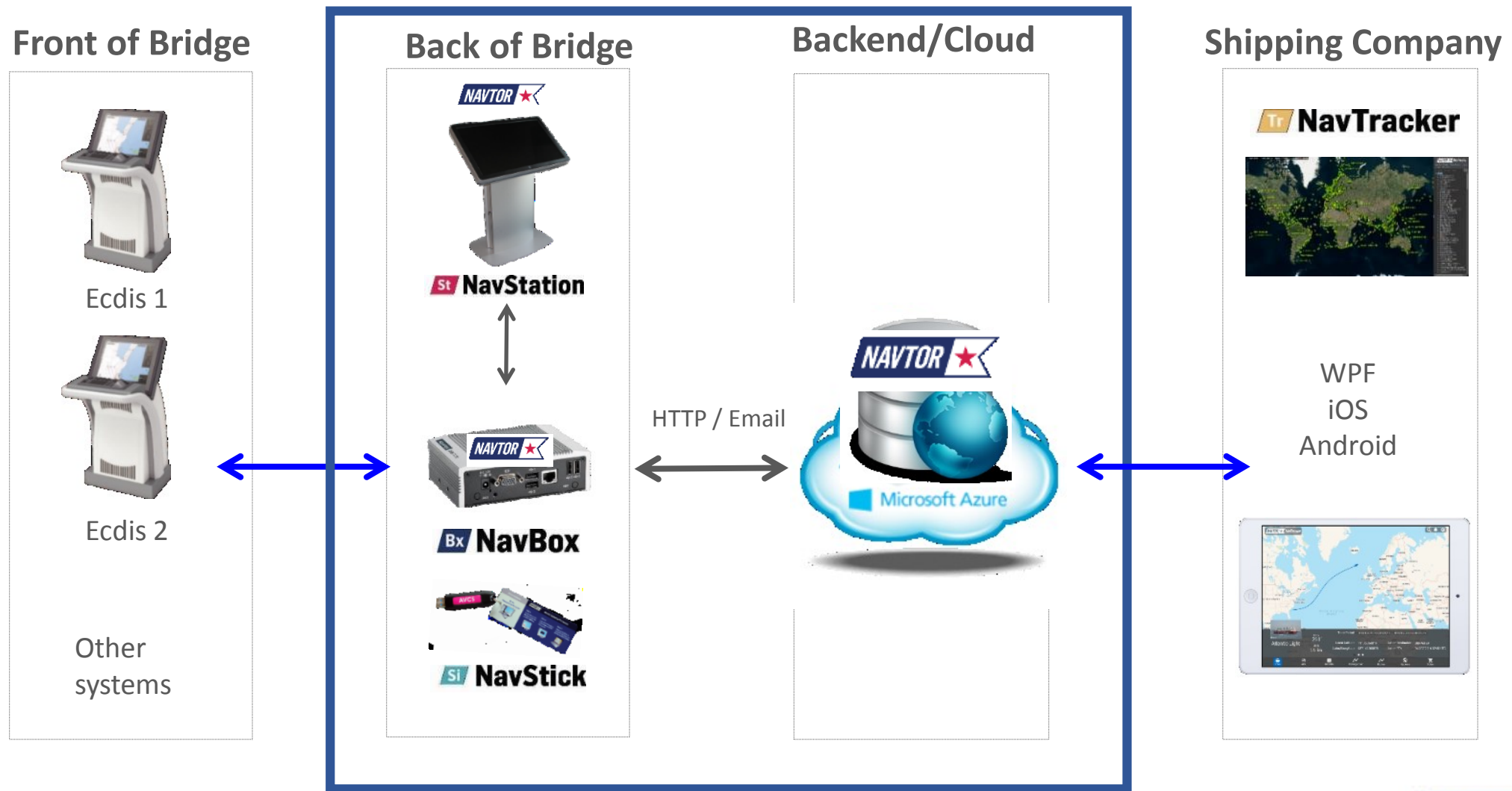


NavStation ; Passage Planning with seamless Data & SW updating





# e-navigation by NAVTOR @ SHORE!



# “Shore Based Bridge”-concept



## FLEET OVERVIEW

### - Dashboard

- Fleet Position update
- Status of Fleet

## FLEET DETAILS - Common Picture

- Planned Route and current Track
- Info overlay
- Note-function sharing info with all users
- Route exchange vessels and Ship-shore

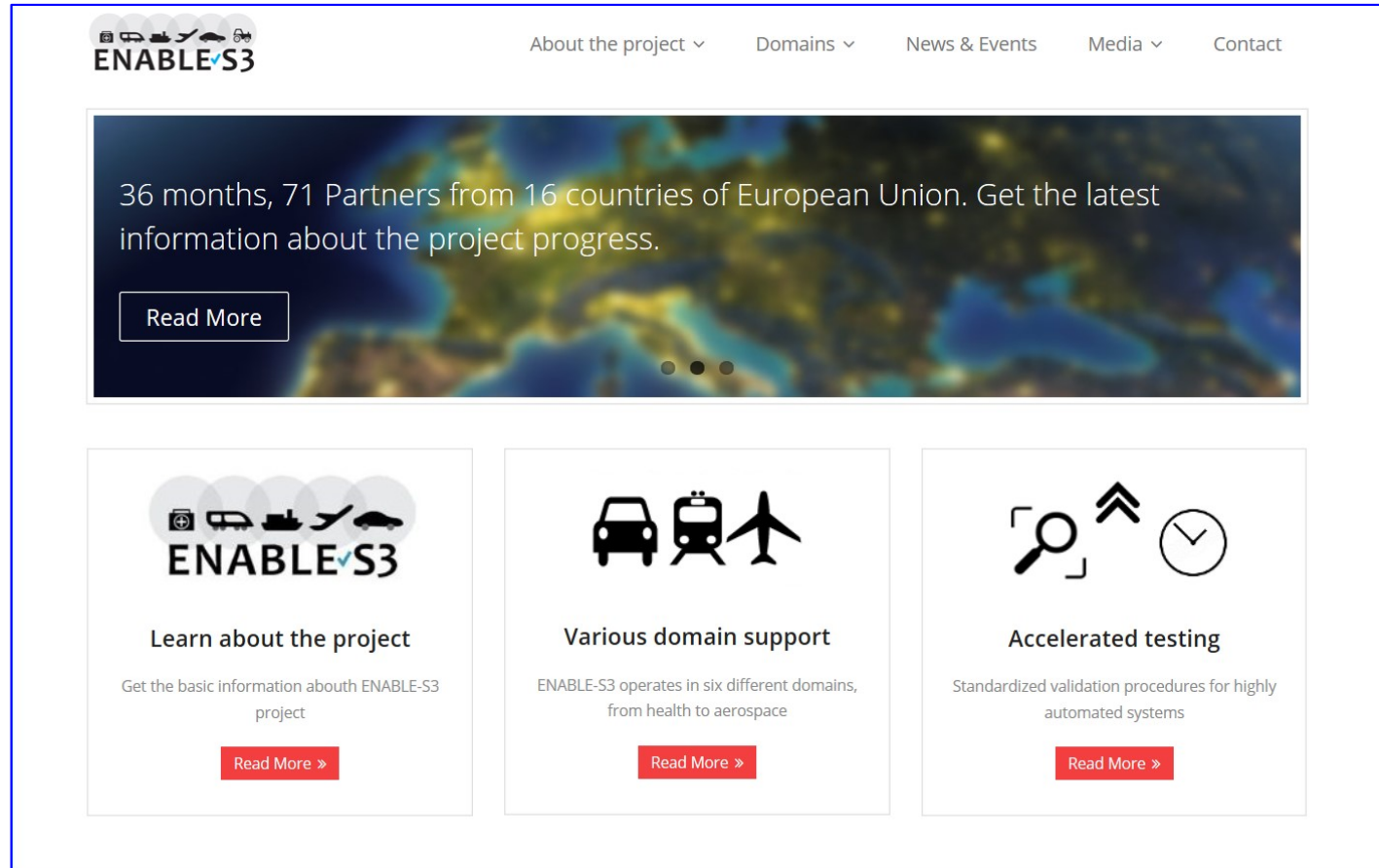
## VESSEL DETAILS - Common Picture

- Planning & Monitoring of a specific vessel
- Detailed real time situational awareness
- **R&D on Crew Reduced vessel, Remote controlled vessel and Autonomous vessel**

Collect, integrate, present, analyze and exchange;  
- another possible realization of the Maritime Service Portfolios



# ENABLE\*S3; Validation & Verification – is an autonomous vehicle safe?



The screenshot shows the ENABLE S3 website homepage. At the top, there is a navigation menu with links for 'About the project', 'Domains', 'News & Events', 'Media', and 'Contact'. Below the navigation is a large banner featuring a map of Europe with the text: '36 months, 71 Partners from 16 countries of European Union. Get the latest information about the project progress.' and a 'Read More' button. Below the banner are three main content blocks, each with an icon, a title, a short description, and a 'Read More' button:

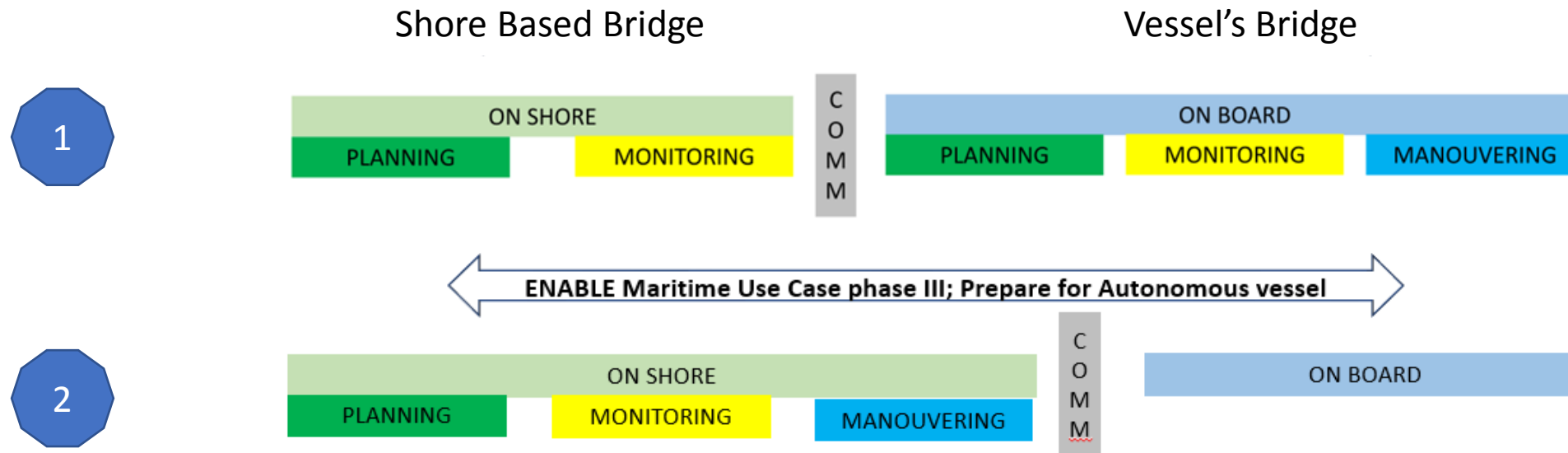
- Learn about the project:** Get the basic information about ENBLE-S3 project.
- Various domain support:** ENBLE-S3 operates in six different domains, from health to aerospace.
- Accelerated testing:** Standardized validation procedures for highly automated systems.

<http://www.enble-s3.eu/>

# Maritime Use Case



- **SUT; Shore Based Bridge for Planning, Monitoring and Maneuvering.**
- UC10 shall serve to elaborate new, advanced **simulation and testing approaches** for the maritime domain by an extensive exchange and use of proven as well as newly elaborated approaches in the ENABLE-S3 project, especially from the automotive domain.



Commercial question; will a “Crew Reduced” vessel, with a SBB, have better Cost/Benefit than a fully autonomous vessel without crew? (“FAIL SAFE”)

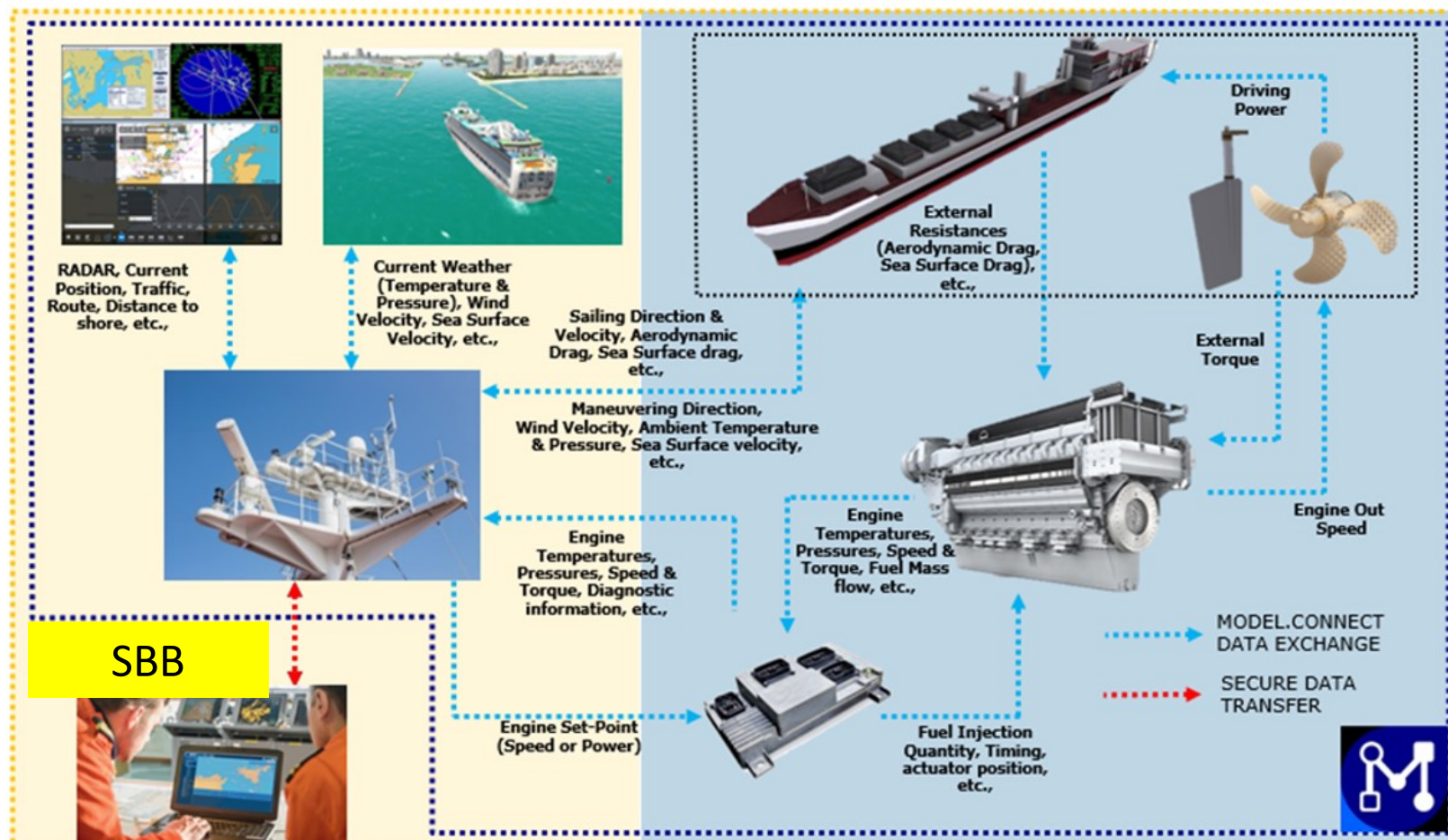


# Maritime Use Case; Co-Simulator



OFFIS OLDENBURG

AVL REGENSBURG

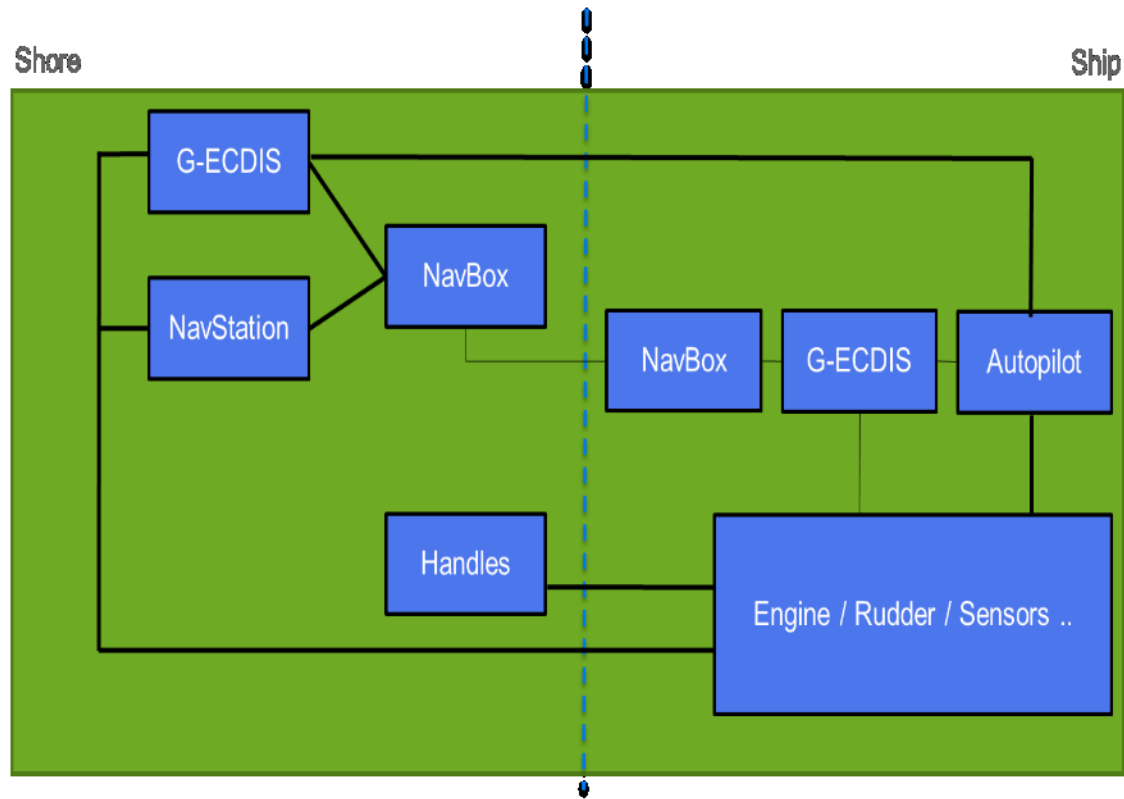


## Scenario based testing:

1. Passage planning and deployment
2. Passage monitoring
3. Reaction to monitoring information
4. Acknowledgement on board
5. Remote vessel guidance
6. "Fail-safe" and "Fail-operational"

Involved partners; AIT, AVL, AVL-SF, BTC, GUT, HAGL, **NAVTOR**, OFFIS, SOTON, TTTECH, VIF, VTT

# CPSE (Cyber-Physical Systems Engineering Labs) Shore Based Bridge; Testing SBB using a Real Vessel



An Autonomous vessel may be a Crew Reduced Vessel  
([SBB-VIDEO](#))



Copyright: Rolls Royce



Shore Based Bridge by NAVTOR. Copyright: NAVTOR/OFFIS





THANK YOU!  
Questions or comments?

**NAVTOR** ★