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

ENABLEvS3
CPSE Labs
CySiMS
SESAME
e-Navigation
SEAFARERS
NavStation
M-AR

Horizon 2020
European Union Funding
for Research & Innovation

ECSEL Joint Undertaking
Electronics Components and Systems for European Leadership

Forskningsrådet
Maritim virksomhet og offshore operasjoner (MAROFF)

e-Navigation made easy
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»

**Five prioritized solutions..**

**S4 – Integration and presentation**
- of available information
- in graphical displays
- received via communication equipment
**PP – Section 1**  
Info from ATT, WP and Port Database

<table>
<thead>
<tr>
<th>Port Database</th>
<th>Tides</th>
<th>NavArea Warnings</th>
<th>ADRS; Radio Signals</th>
<th>ADLL; List of Lights</th>
<th>ATT; Total tide</th>
<th>Weather &amp; WX-time series</th>
<th>ENC Service; PAYS</th>
<th>Desktop with Maritime APPS</th>
</tr>
</thead>
</table>

**PP – Section 4**  
Info auto-listed within corridor (XTD)

**NavStation**; Passage Planning with **seamless Data & SW updating**
e-navigation by NAVTOR @ SHORE!

Front of Bridge
- Ecdis 1
- Ecdis 2
- Other systems

Back of Bridge
- NavStation
- NavBox
- NavStick

Backend/Cloud
- Microsoft Azure
- HTTP / Email

Shipping Company
- NavTracker
- WPF
- iOS
- Android
- Other systems
“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?

http://www.enable-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.

1. **Shore Based Bridge**
   - **ON SHORE**
     - PLANNING
     - MONITORING
   - **COMM**

2. **Vessel’s Bridge**
   - **ON BOARD**
     - PLANNING
     - MONITORING
     - MANEUVERING

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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

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)
THANK YOU!
Questions or comments?