Integrated Maritime Services

Linking Geospatial Data

June 2014 - INSPIRE conference

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Maritime

Do you know what maritime is?
Maritime information systems
should provide services in response to the functional needs of EU users

- SafeSeaNet
- CleanSeaNet
- LRIT
- Thetis (PSC)
SafeSeaNet

- Community vessel traffic monitoring and information system, established by Directive 2002/59/EC (as amended), for:
  - maritime safety
  - port and maritime security
  - marine environment protection
  - the efficiency of maritime traffic and maritime transport

- Initiated in October 2004, and operational since 2009
- National AIS systems managed by Member States and central SSN managed by EMSA
- Approximately 2500 users (VTS, MRCC, Ports).
- Governance body = SSN High Level Steering Group (MS/Commission)

Around **17,000 ships per day** are tracked in European waters
Over **100,000,000 AIS positions per month** are recorded
Over **99%** availability
CleanSeaNet

- Legal basis: Directive 2005/35/EC
- Started in 2007
- Use satellite radar detection (> 2,000 images/year)
- Objective: EU oil spill and ship target detection
- Approx. 500 users (Pollution control)
- Governance = CSN User Group (MS/Commission)

Alerts issued within 30 minutes since the satellite acquisitions
Long Range Identification & Tracking

IMO SOLAS amendment & EU Council LRIT Res. 2007

- Started in 2009
- Based on communication satellites (Inmarsat, Iridium).
- Monitoring EU ships worldwide: almost 9,000 vessels
- All ships within 1,000 Nm
- Long range maritime picture
- Approx. 500 users (Flag State, Coastal State, SAR)
- Governance body = LRIT NCA’s

- LRIT International Data Exchange (IDE) is also operated by EMSA
THETIS

- An information system for Port state control inspections
- A tool for PSC inspectors to target ships and report inspection results
- A reference repository of information on ships connected to several databases
- Statistical analysis in real time
- Data exchange with SSN
Integrated Maritime Data Environment

SSN
- Short range maritime picture around EU coastline
- Dir. 2002/59/EC as amended

EU LRIT DC
- Long range maritime picture for EU ships
- IMO MSC 202, 211 Council LRIT Res. 2007/Oct

CSN
- Oil spill and Vessel detection picture around EU coastline
- Dir. 2005/35/EC Reg. 100/2013

THETIS
- Port State Control inspections
- Dir. 1999/35/EC Dir. 2009/16/EC

SafeSeaNet
- 2004

CleanSeaNet
- 2007

EU LRIT DC
- 2009

THETIS
- 2013/2014

IMDatE
- 2013/2014
Integration = user driven approach

- Over 3,000 users of EMSA VTMIS-related systems
- Applications have large number of common users
- Individual (different) user management systems at application level
- 4 interfaces and 4 sets of uncorrelated data

Users are asking for value added information based on integrated data
Integration of Maritime Data

• Building higher order products/services

- Raw position reports – AIS, VMS, LRIT...
- Positions enriched with other operational data
- Multi-Source Positions → Track creation
- Use satellite data & incident information
- Behaviour monitoring

- Filtering over large amounts of data. Customization. Summarised reports. Help the operators!
- Enrich the maritime picture, detect non-reporting, add operational information
- Fill the gaps. Detect erroneous reporting. Investigate history.
- Link to other operational information. Remove more inconsistencies.
- Data consistency and data gap problems
Tailor-made Integrated Maritime Awareness Picture

EXCLUSIVE PICTURE

USER

Mobile data

Local position data

Tailored Ship Register

Vessel Position Data
(radar, AIS, VMS, on board data)

Incidents, sightings or inspections

Domain Specific Ship Register

EMSA

SafeSeaNet

CleanSeaNet

EU LRIT DC

THETIS

AIS data

EU LRIT Data

Earth Observation Data

Satellite AIS Data

Vessel information
Anti-piracy support for merchant fleet monitoring

Border Control

Fisheries

Search And Rescue
Maritime Organizations (MO) need to procure solutions for monitoring: oil spills, supporting Search and Rescue operations, vessels incidents analysis, identifying vessels to inspect, and other similar activities. As such maritime sector manages a number of diverse spatio-temporal “features” (vessels, oil spill, etc.) which are central to the maritime Geospatial domain.
• maritime use cases are complex to capture and turn into requirements. This complexity can hamper the capability to provide effective and efficient geospatial services to the maritime community (Quality of Service). In some cases, a use case driven approach ends up with long cycles of project implementation, and complex change management procedures.
Challenges

• Besides the use cases’ complexity, MO must address the challenges posed by maritime technical issues, them being: (i) acquisition of real-time dataset (velocity), (ii) processing of large amounts of dataset (volume), and (iii) combination of different types of data sources (variety).

• The complexity of the use cases, the rigidity of the implementation process, and the challenges set by the technical issues require the formulation of a new strategy for implementing Maritime Information Systems.
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Common Operating Picture for Oil Spill Responses

- Enterprise view of oil spill response
  - Definition of COP
  - Users of OSR COP
  - Scenarios for use of a COP
- Geospatial information in the OSR COP
  - Geospatial information
    - Considerations for COP geospatial information
    - Organization of geospatial information
  - Base map and reference information
  - Drill and incident specific information
- Delivering Geospatial Information for the OSR COP
  - Interoperability architecture
  - Web service delivery to users
  - Information schemas, metadata and encodings
  - Inputs to the response center
  - Disconnected user operations
  - Records retention and provenance

Use Case

Solution

Recommended Practice
Conclusions

- EMSA provides Spatial Data Services (SDS) to its stakeholders

- The EMSA’s challenges are driven by:
  - User / Use Cases
  - Technology
  - Quality

- EMSA is facing the needs to frame a new strategy for providing SDS services, clustering SDS: Monitoring, Response, Analysis, and Sharing

- EMSA is going to PROCURE SDS services based on a capability driven approach.
Integrated Maritime Services
Showing the bigger picture

www.emsa.europa.eu