

IMDatE technical concept

Submitted by EMSA

<i>Summary</i>	This document is intended to outline the high-level architecture of the IMDatE platform, the main modules needed to support the integration of existing systems and to open the discussion for the future development of integrated services.
<i>Action to be taken</i>	As per paragraph 3.
<i>Related documents</i>	HLSG 6, agenda item 10: Integrated Maritime Data Environment - IMDatE (EMSA)

1. IMDATE = AN INTEGRATED TECHNICAL PLATFORM

During 2011, EMSA has developed and/or transferred all its operational systems (SSN, LRIT, CSN, THETIS) in-house. The process of hosting and operating systems on EMSA own ICT platform reveals fundamental differences in the way each system was designed and developed, both in terms of operational and technical/technological design.

Hosting, operating, maintaining and further developing the systems as separate individual applications was no longer feasible, neither from an economical or technical perspective, as it was requiring extensive resources. Harmonization, rationalisation and consolidation of operational and technical approach was identified as the most feasible way forward to ensure sound financial and operational management in the actual circumstances.

The IMDatE project was created to start the necessary operational and technical optimisation. 2011 was mainly dedicated to analysis of the main gaps and differences between the existing systems and to decide on the most suitable technical approach for an efficient and cost-effective operation and maintenance approach, whilst ensuring the future capability of integrating data from various systems in line with legal and operational requirements.

The guiding principle of the analysis was to re-use as much as possible modules and services/interfaces already developed within the existing systems and to develop a Service Oriented Architecture able to provide a fast, flexible and configurable exchange of data between systems; always in accordance with the data access rights associated to each system and/or user.

The resulting technical solution to suit the optimisation of EMSA systems is graphically presented in the high-level architecture diagram presented below and is further detailed in the context of this paper.

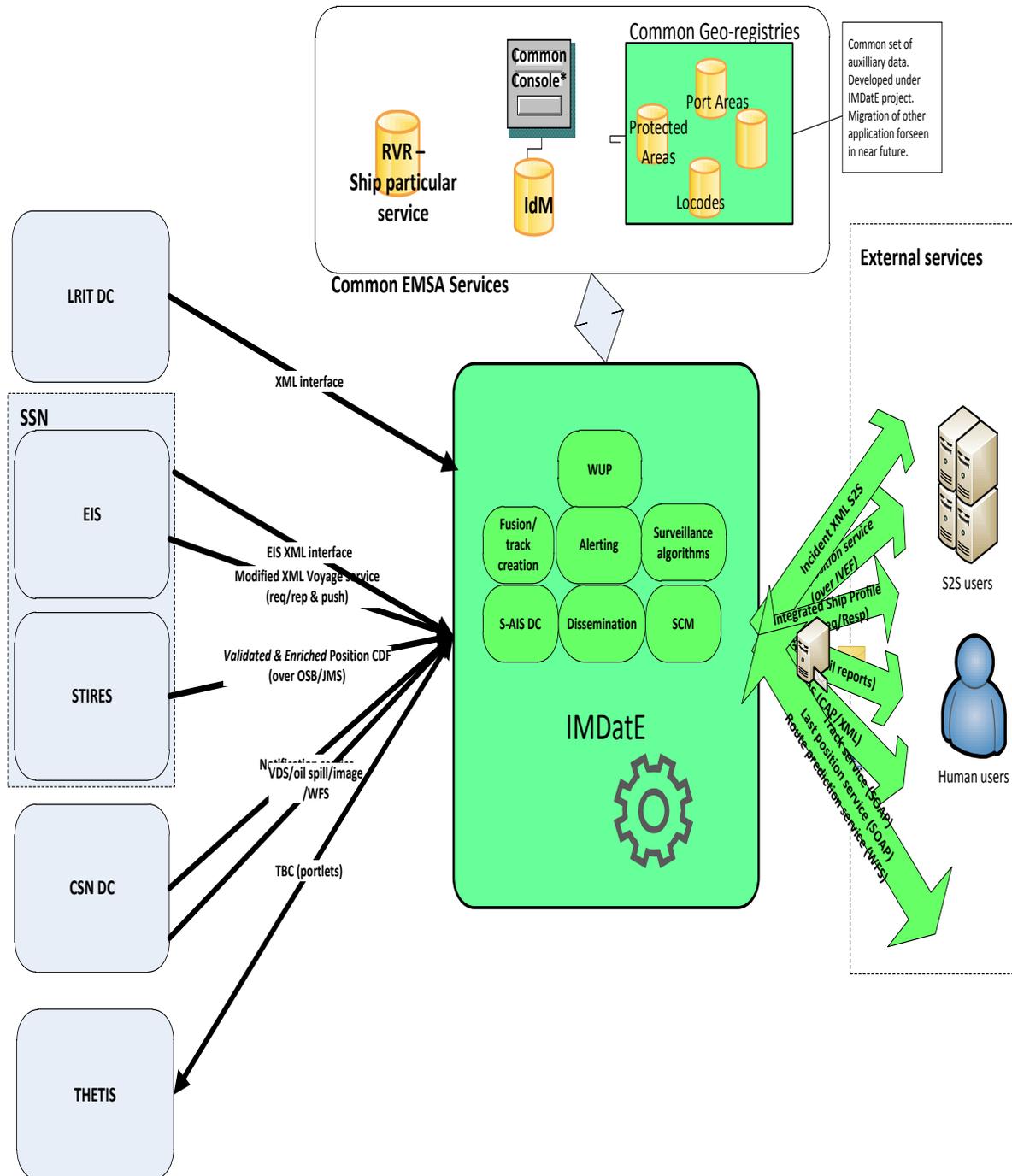


Fig. 1 - IMDatE high level bloc architecture diagram

2. IMDatE MODULES

The main modules of the IMDatE platform are:

- Existing systems – SSN, LRIT, CSN, THETIS
- Central User Management Console and Single Sign One tool
- Reference Ship Registry
- Common Geo-Registries
- Data Fusion Module
- Sat-AIS data processing module
- New Graphical User Interface
- New system-to-system interface

The primary modules of the IMDatE platform are the existing systems (SSN, LRIT, CSN, THETIS) which are the main data providers into the integrated platform. All systems will therefore continue to exist and process their data as they are doing today. The main change in terms of data output is that in addition of the existing system specific data distribution rules, data from each system is also made available to the IMDatE data fusion module for the purpose of building integrated data flows, always in compliance with existing data access rights.

For example: - if a user is a SSN user and a LRIT user, then he can use IMDatE interface to receive integrated SSN and LRIT information, according to the data access rights defined in both SSN and LRIT systems.

In addition, the IMDatE will also be able to ingest and process 3rd party data/information in according with their associated data access rights, and either fuse or display this data separately, as required.

In order to achieve this level of integration and flexibility, another important change introduced by the IMDatE is the Central User Management Console and the associated Single Sign One (SSO) log-in procedure. Actually, each existing system has its own user management system with significant differences from one to the other. The result is that a user of an existing system cannot be recognised by another system because the user (even if actually is the same) is defined in a different manner. The newly developed IMDatE Central User Management Console will standardise the way a user is defined in order to be recognised by all systems. Associated to this centralised user management a new SSO log-in procedure will be introduced which will enable a user to log only once into EMSA portfolio of services and to have access to all systems/services he is entitled according to his profile.

A similar situation (of differences between systems) is also in the case of ship particulars and geographical (ports locodes, areas, etc) information. Therefore new centralised and harmonised databases will be created by IMDatE through the Reference Vessel Registry (harmonised ship particulars) and the Common Geo-registries (harmonised Locodes and areas).

These three new modules are illustrated in the diagram in the top box under the name of Common EMSA Services and they will be used in the future by all existing systems for providing a common set of data to avoid inconsistencies.

IMDatE will also make use of the existing SSN ship position validation and enrichment process. In summary, that means that all ship positions provided by various ship tracking systems (AIS, SAT-AIS, LRIT, VMS, VDS) will go through a unique process of validation and enrichment. This harmonisation was achieved by adjusting and exposing the existing SSN process to be able to handle other types of ship position data. The validated ship position information is then processed by the IMDatE Data Fusion module which ensures the correlation and fusion of data into an integrated ship track.

The user will have the option of changing from one ship traffic monitoring layer to another or to the integrated track (demonstration included in the prototype presentation).

A new important module of the IMDatE is the SAT-AIS data processing capability. This module will be able to process SAT-AIS information from different providers and then distribute the data either as an individual stream or as part of the integrated track.

Last but not least, the IMDatE will develop new user interfaces, both graphical web-based and system to system, able to handle integrated data and multiple customised visualisations to suit different user communities.

3. VALUE ADDED SERVICES

In addition of the immediate benefits of increased efficiency and sustainability in the operation and technical management of EMSA systems, the IMDatE platform can provide enhanced services and functionalities to the users. Some of the potential generic Value Added Services (VASs) identified so far are:

3.1 Ship related services:

- Integrated ship profile: - last available ship position (as available from all ship positioning systems – AIS, LRIT, reported) and cross-checked ship and/or cargo details (as available from different systems);
- Ship track: -integrated ship track
 -calculated future track (extrapolation of available positions)
- Ship voyage: - arrival and departure port/route information
 - Hydro-meteorological information along the voyage

3.2 Ship traffic monitoring services:

- Permanent monitoring = the system will automatically correlate and fuse all available ship positions;
- Lookout monitoring = the users will be able to set-up specific rules for particular monitoring requirements (behaviours, routes, port entry);
- Area of Interest, Time of Interest, Vessels of Interest, Event of Interest = user will be able to set-up specific areas for monitoring;

- The integrated ship track can be correlated with available VDS data (satellite or shore/mobile radar detection) and provide the picture of cooperative and non-cooperative targets

3.3 Alerting and reporting services:

- Create alerts = user can set-up its own alerting rules depending on area/time/type of vessel/type of incident;
- Create reports = user can choose what type of reports should be provided by email or XML interface by choosing from a range of available templates;
- Coloured code visualisation = different visualisation modes from a range of available symbols and information layers;

Whilst the above mentioned VASs are mainly a result of the integration framework, ultimately its users will influence the type of integrated services which have to be developed in the future.

4. ACTION REQUIRED

Member States are invited to take note of the information provided and provide their comments.