



DEVELOPMENT OF AN E-NAVIGATION STRATEGY IMPLEMENTATION PLAN

Report from the Correspondence Group on e-navigation to NAV 57

Submitted by Norway

SUMMARY

<i>Executive summary:</i>	The Correspondence Group on e-navigation has presented the developed complete, overarching architecture on e-navigation, an enabling maritime data framework, the progress of the gap analysis, as well as a draft outline for the final Strategy Implementation Plan on e-navigation. The action points reflect the issues relevant to NAV 57.
<i>Strategic direction:</i>	5.2
<i>High-level action:</i>	5.2.6
<i>Planned output:</i>	5.2.6.1
<i>Action to be taken:</i>	Paragraph 61
<i>Related documents:</i>	MSC 85/26, annexes 20 and 21; MSC 86/23/4; MSC 86/26, section 23; NAV 55/WP.5; NAV 56/8; NAV 56/WP.5, annex 1; NAV 56/INF 10(Republic of Korea); STW 42/WP.1; COMSAR 15/WP.6/Rev.1

Background

1 The Maritime Safety Committee at its eighty fifth session approved the Strategy for the development and implementation of e-navigation, and then at its eighty sixth session approved a proposal for a coordinated approach to the implementation of the e-navigation strategy. The proposal outlines a joint plan of work for the NAV, COMSAR and STW Sub-Committees for the period 2009-2012. According to the plan, NAV 56 finalized the user needs, the initial system architecture, and completed an initial gap analysis, initial cost benefit and risk analysis, taking into account the recommendations of COMSAR 14.

2 Working groups for implementation of the e-navigation strategy have been established by the NAV, STW and COMSAR Sub-Committees respectively. These working groups are being assisted by a Correspondence Group.

3 Norway would like to thank the following Member States, intergovernmental organizations, governmental and non-governmental organizations for their participation in the correspondence group: Argentina, Australia, Bahamas, Belgium, Brazil, Bulgaria, Canada, Chile, China, Cote d'Ivoire, Denmark, Finland, France, Germany, Ghana, Greece, India, Ireland,

Islamic Republic of Iran, Italy, Japan, Kenya, Republic of Korea, Luxemburg, Marshall Islands, The Netherlands, Nigeria, Philippines, Poland, Portugal, Russian Federation, Senegal, Singapore, South Africa, Spain, St. Kitts & Nevis, Sweden, Turkey, Ukraine, United Kingdom, United States, European Commission, BIMCO, CIRM, IALA, ICS, IFSMA, IHMA, IHO, IMPA, IMRF, IMSO, Nautical Institute, OCIMF and WMO.

Terms of reference for the re-established correspondence group

4 NAV 56 re-established the correspondence group under the coordination of Norway and instructed it to take into account document MSC 86/23/4 relating to the joint work plan for COMSAR, NAV and STW Sub-Committees for the period 2009-2012, the comments and general views expressed at NAV 56 and, decisions taken by NAV 52 including the guidance in MSC/Circ.1091 on Issues to be considered when introducing new technology on board ship and MSC/Circ.878-MEPC/Circ.346 on Human Element Analyzing Process (HEAP). The Correspondence Group on e-navigation should undertake the following tasks:

- .1 consider documents NAV 56/8, MSC 85/26 (annex 20, paragraph 9.7.2 and annex 21, paragraph 5) and NAV 56/WP.5, annex 1, and finalize the system architecture;
- .2 consider documents NAV 53/13 (annex 3), NAV 56/INF.10 (Republic of Korea) and MSC 85/26 (annex 20, paragraph 9.7.3 and annex 21, paragraph 6), and progress the initial gap analyses focusing on technical, regulatory, operational and training aspects;
- .3 submit a report to STW 42 (24 to 28 January 2011) raising specific questions, if required, that should be addressed by STW;
- .4 submit a report to COMSAR 15 (7 to 11 March 2011) outlining an overall conceptual, functional and technical architecture and the progress made in the initial gap analyses focusing on communication and SAR issues;
- .5 submit a consolidated progress report to NAV 57 (6 to 10 June 2011) outlining the further analyses for navigation and related shore-based services issues, the completed and ongoing work including a provisional outline/draft of the Strategy Implementation Plan and progress on the cost benefit and risk analyses; and
- .6 based on the requirements stipulated in the e-navigation strategy section 8 (MSC 85/26, annex 20) to identify and describe an enabling data framework to support user needs and ensure maximum interoperability.

The overarching e-navigation architecture

5 A further development of the e-navigation architecture has been performed. It visualizes how the current e-navigation architecture was derived from the high level concept, and introduces important principles of the e-navigation architecture. Relevant principles for a shore-based system architecture harmonized for e-navigation are established.

6 At NAV 56, a 'common data structure' was endorsed (NAV 56/8: Figure 2: Conceptual e-navigation architecture). The scope of this 'common data structure' is confined to the maritime domain, hence the title the Common Maritime Data Structure (CMDS). The CMDS will serve as a common reference for all implementers of e-navigation and thereby accommodate for a certain degree of harmonization.

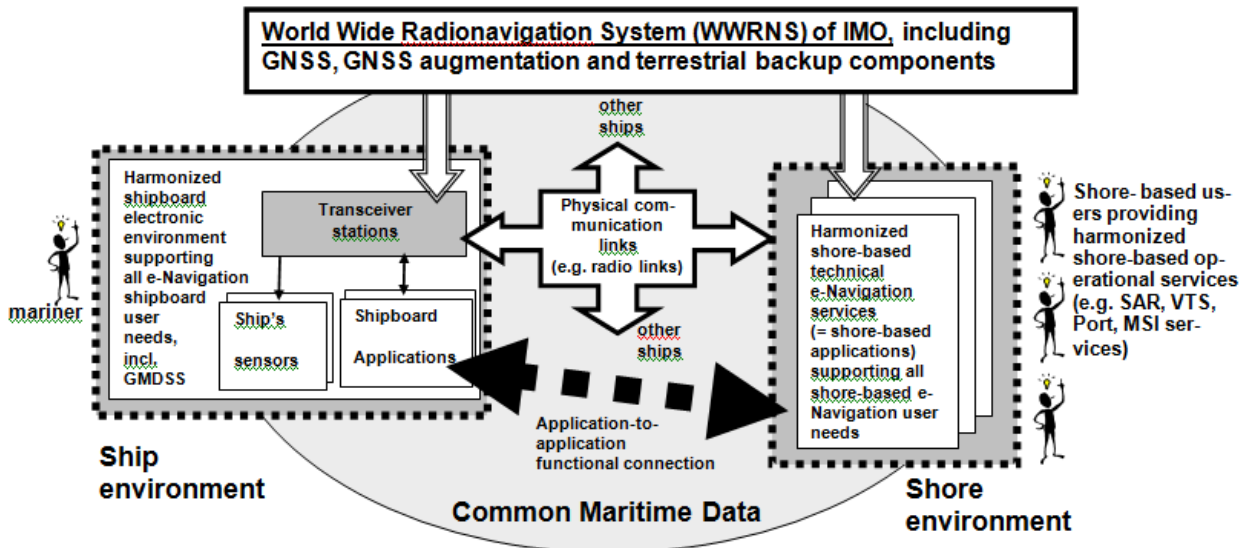


Figure 1 (as endorsed by NAV 56/8, Figure 2)

7 Figure 1 did not convey the full notion of the e-navigation concept. When considering the e-navigation architecture, one should think in terms of information/data flow, application interactions, and user interfaces. It is therefore necessary to refine the figure into an information/data flow oriented graphical representation.

8 Figure 2 shows the principle of an information/data flow in the e-navigation architecture while the structural details of both the technical shipboard and shore-based e-navigation system architectures are not yet shown. This brings into focus the 'operational service' level and the 'Functional links used by Technical services' and the 'Physical links used by Technical services'. This is a further development as it highlights the fundamental distinction between information and data domains; explaining the relationship between the user requested information items; putting the concepts of Operational Services, Technical Services as well as Functional and Physical Links into a hierarchical perspective; identifying the place of the concept of 'Maritime Service Portfolio'; and unfolding the relationship of shore-to-shore data exchange.

The figure shows the complete overarching e-navigation architecture, and defines two additional important features:

- .1 The Common Maritime Data Structure (CMDS) that spans the whole of the horizontal axis;
- .2 The World Wide Radio Navigation System (WWRNS).

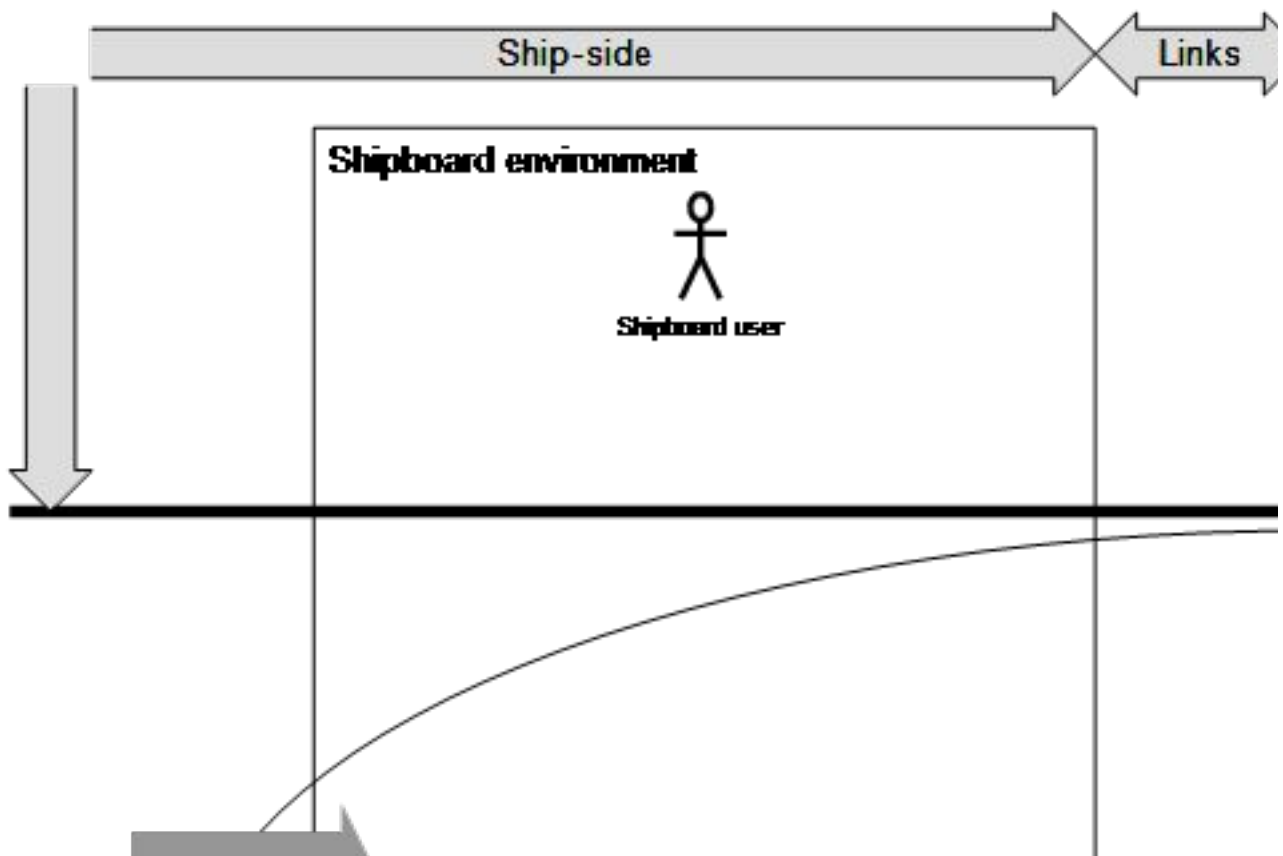


Figure 2. The complete overarching e-navigation architecture.

9 The Sub-Committee is invited to endorse the complete overarching e-navigation architecture.

An enabling maritime data framework

10 COMSAR 14 recognized the need to achieve a common data structure in order to meet the goals of e-navigation and to respond to the needs of the stakeholders within the maritime domain. In general it was agreed, taking into account the original principles for e-navigation, that:

- .1 formats for the collection, exchange and distribution of data should be harmonized and standardized where practicable and appropriate;
- .2 processes and procedures for the collection, exchange and distribution of data should be arranged in a uniform way, where practicable, and in accordance with the internationally agreed standards;
- .3 the services providing the data and information, as well as the systems used for these purposes, should be interoperable in such a way that the use and re-use of data can be enhanced; and
- .4 consequently the development of open standard interfaces should be encouraged.

11 At NAV 56, a review of existing and emerging data structures and frameworks were recommended to ensure its efficiency and interoperability with other data information systems (NAV56/INF.9). The Correspondence Group was tasked with this development.

12 The scope of the 'common data structure' is confined to the maritime domain. Hence, the Common Maritime Data Structure (CMDS) will serve as a common reference for all implementers.

The functional relationships of the CMDS are illustrated in Figure 3:

- .1 The CMDS can represent any maritime entity, can be extended by the addition of new entities, and is accessible to any stakeholder or implementer.
- .2 The CMDS is an abstract representation of parts of the maritime domain. Specifically, it represents the entities and relationships among the entities that exist in this domain but does not represent processes.
- .3 The CMDS contains no details about physical representation of the entities within it. However, the CMDS can be used to guide the development of databases and interfaces.
- .4 The CMDS is flexible and extendable for meeting future requirements. New entities can be added by any stakeholder through a process known as registration.

Figure 3 illustrates how the CMDS would be created – based on user requirements – and how it would influence the components of the e-navigation architecture when creating hardware and software used for e-navigation purposes.

Common Maritime Data Structure (CMDS)

Ship technology environment harmonized for e-navigation

Shore-based systems harmonized for e-navigation.

User requirements

User requirements

Templates + methodology

Templates + methodology

Encoding for
Physical Links