Title   *Efficient, Safe and Sustainable Traffic at Sea*

Acronym   *EfficienSea*

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The e-Navigation manual

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Document History

Revision	Date	Organisation	Initials	Revised pages	Short description of changes

INTRODUCTION

This deliverable covers the manuals made for the individual component developed during the project. This comprises:

The manual for the ship side e-Navigation prototype system:

> D_WP4_6_2 part 1: ee-INS User guide

And the manual for the shore side MSI system:

> D_WP4_6_2 part 2: User guide MSI

SUMMARY OF THE WORK PACKAGE

The overall idea of work package 4 has been to rapidly go through the e-Navigation development cycle as described in the IMO e-Navigation strategy, in order to very quickly get to the "Review lessons learned" point, with the aim to propose standards for future e-Navigation services, which actually have been verified in a test bed. The project has been going through the following steps, in accordance with the IMO e-Navigation development model:

IDENTIFICATION OF USER NEEDS

A number of tasks were undertaken in order to identify a number of user needs. Of course, it has not been the projects goal to identify all relevant user needs within e-Navigation; however a number of needs with particular relevance to the participating organizations have been identified. The methods for identification has included, interviewing mariners, having sessions with mariners in focus groups and conduction simulations during which user needs were identified by observing usability experts (mariners should read mariners and other relevant users, also shore users).

1 IMO e-Navigation strategy

ARCHITECTURE AND ANALYSIS

A draft architecture for the development of prototype e-Navigation services was established. The main components needed in this context, was to identify a suitable platform and communication solutions. The development platform chosen was OpenMap, an open source platform for showing geographical information which during the project was extended to include e-Navigation prototype services. Communication solutions include IP connection to shore e-Navigation providers through GSM, VHF data and satellite connections and AIS connectivity through the test vessels pilot plugs.
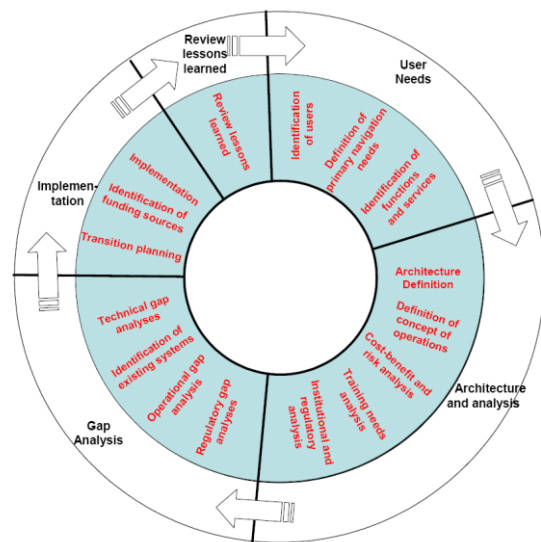
GAP ANALYSIS

Not particularly relevant for the test bed trial.

IMPLEMENTATION

Based on the identified user needs and the draft architecture, prototype services were developed and the solutions were installed at test sites, mainly a fleet of various types of vessels. The services include:

- Getting prognosis for meteorological and oceanographic parameters on a vessels route to the vessel
- Showing MSI in the navigational chart following a new format for data and portrayal
- Transmitting vessels intended route to other vessels and shore users through AIS
- Transmitting route suggestions from shore user (VTS) to vessels
- Sending search areas to be used for SAR

Other services have been developed but will not be tested within EfficienSea

- Showing simple no-go areas for vessels instead of detailed depth curves
- Indication of dynamic risks for vessels

Within the work package, a framework for testing these services subsequently has been established.

REVIEW LESSONS LEARNED

Information is gathered from the test users, in order to evaluate the value of the various services. Again, this has been done in various ways; interviews, observations, focus groups and full scale simulations.

WORK PACKAGE ACHIEVEMENTS AND MAIN OUTPUTS

EfficienSea (WP4) has in collaboration with IALA conducted two successful international e-Navigation conferences. The success has been so clear, that the conference actually also will take place in 2013, after the termination of EfficienSea. Proceedings from these are deliverables from the project.

The implementations of the above mentioned services have been placed on the internet as open source software. The objective of this is twofold:

> Other parties can obtain the software and run similar tests of the same services in different regions of the world, with a different set of users. This would be of great value in the assessment of the value of the services.

> And secondly, other parties could obtain the software and build new services based on the same platform. This would mean that they would be able to do this fairly quickly, without having to start from scratch. Also, parties already using the platform would get easy access to the new services, if the developers chose also to make it available to anyone.

The results from the project (the proposed validated e-Navigation services) have been submitted to the relevant organizations; mainly IMO and IALA.

OVERVIEW OF THE WORK PACKAGE PROGRESS

No major deviations have occurred. During the course of the project there was one major de-route, which however turned out to be somewhat a benefit:

From the beginning of the project, it was the intension that the services to be developed, was to be developed by the industry. This turned out only to be possible on a relatively small scale (for reasons se deliverable on recommendations from the project). In the end, the partners decided to undertake the development themselves. The drawback was that we got started with the development rather late; the benefit is that most software developed has been made available to everyone as open source opening up for the possibilities outlined above.

LESSONS LEARNED AND CHALLENGES

These topics are covered in the deliverable 'recommendations from the project'.