

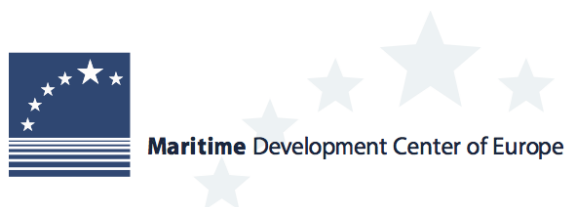
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Possibilities and barriers for developing the Maritime Cloud

- *Governance, Business models and Legal Aspects*

Report on High Level User Group meeting
Copenhagen, October 8th 2015



THIS PROJECT HAS RECEIVED FUNDING FROM THE EUROPEAN UNION'S
HORIZON 2020 RESEARCH AND INNOVATION PROGRAMME UNDER
GRANT AGREEMENT NO. 636329

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1. Introduction

New ICT solutions are rapidly improving the possibilities for increasing safety at sea and enhancing the efficiency of the maritime industry. The overall objective of the EfficienSea2 project is to co-create and deploy innovative solutions for safer and more efficient waterborne operations. The project consists of a consortium, encompassing excellent technical and human factor competences, equipment, system- and service providers as well as authorities and international organizations, with expert domain and regulatory knowledge and influence.

One of the core elements in the EfficienSea2 project is to develop and test the Maritime Cloud, which is a ground-breaking communication framework that will improve information sharing in and around the maritime sector for smarter traffic management, facilitating a comprehensive e-maritime and e-navigation environment, enabling the maritime internet of things.

In order to support the work of the EfficienSea2 project and maximize impact a High Level User Group (HLUG) has been appointed. The HLUGs task is to give advice on user needs and expert input on the possibilities and barriers for the development of new Information and Communication Technology (ICT) solutions.

This report summarizes the results from the first HLUG meeting of the EfficienSea2 project, which was held in Copenhagen 8 October 2015. The objective of the meeting was to identify possibilities and barriers for the development of the Maritime Cloud. The focus was on governance models, legal aspects as well as business models that are relevant for the successful development and operation of the Maritime Cloud (MC).

The HLUG input was given both as individual input from each participant as well as through joint discussions. The meeting was divided into 4 sessions. During the first session each participant gave input to the MC based on a SWOT analysis that was prepared beforehand. During the second session the possibilities and barriers regarding the governance of the MC were discussed. The third session addressed the business models for the MC while the fourth session addressed the legal issues related to the development and operation of the MC.

2. Participants:

Members of the High Level User Group

Company	Name	Title
BIMCO	Jeppe Skovbakke Juhl	Senior Marine Technical Officer
CESMA	Capt. Fredrik J. van Wijnen	General Secretary
Danish Maritime Authority	Erik Tvedt	Special Adviser
DNV-GL Maritime	Sascha Müller	Regional Business Development Manager
Ericsson	Dogulas Watson	Director - Business Unit – Shipping
GS1 Denmark	Douglas Hill	Chief Operating Officer
IALA	Michael Card	Deputy Secretary-General
ICS	Matthew Williams	Senior Marine Adviser
Lloyd's Register, Copenhagen	Kim Wiese	Marine Business Development Manager for DK
Maersk Maritime Technology	Kim Henriksen	Lead Naval Architect
Nautical Institute	Captain Harry Gale	Technical Manager
SMHI Weather Solutions	Lennart Cederberg	Global Product Manager at GAC
Swedish Maritime Authority	Ulf Siwe	MONALISA 2.0 Communication Officer

Representatives from the EfficienSea 2 project:

DMA	Bjørn Borbye Pedersen	Business Developer and Special Advisor
DMA	Jens Kristian Jensen	Innovation Engineer
DMA	Katja Øder	Innovation and Communication Manager
MDCE	Jan Boyesen	Business Development Manager
MDCE	Louise Boesen Karlsen	Project Manager

3. Meeting agenda

The agenda for the HLUG meeting was the following

1. Welcome and introduction to the day by Jan Boyesen, MDCE
2. Introduction to the EfficienSea2 project by Bjørn Borbye Pedersen, DMA
3. Table Round – short initial prepared input to the Maritime Cloud (MC) from each HLUG participant based on a SWOT analysis
4. Presentation of the Maritime Cloud by Jens Kristian Jensen, DMA
5. Discussion of the possibilities and barriers related to governing the Maritime Cloud
 - Governance aspects
 - Business models
 - Legal aspects

4. SWOT

Overview of the SWOT on the Governance of the Maritime Cloud.

Strengths <ul style="list-style-type: none">• Narrow focus on the shipping industry• Substantial budget and support by the EU• Good timing• Scalability - due to open source• Harmonized solutions• Technical neutrality	Weaknesses <ul style="list-style-type: none">• The project is very broad and too ambitious• There is a weak collaboration with other projects• Lack of port cooperation• No clear commercial need or commercial demonstration of MC• Not modern gear on board many ships• Too many data formats and different systems to be included• Lack of branding the project• Not the core business of a maritime authority
Opportunities <ul style="list-style-type: none">• Maritime Cloud has overall momentum• Can create a platform for business development• Enabler to improve safety at sea• Automated updating, ensuring updated data without human involvement• Working closely together with other projects and related initiatives• Implement global standards and involve major commercial players such as IBM, Ericsson and GS1 and draw on their experiences• To be technology neutral – so the concept can be deployed despite technological developments• Use existing technologies• Huge opportunities for hinterland transport and Supply Chain connectivity• China, Korea and Japan are potential takers of the project	Threats <ul style="list-style-type: none">• Cyber security, liability and insurance are major threats• General trend towards reversing openness• Many stakeholders, conflicting interests and small kingdoms as well as competing projects• Lack of progress of Single Window and too many previous projects with no effect• Very complex technical task. Many formats and different systems• Shipping is a “conservative” industry• DMA is experiencing organizational changes• No clear management structure of MC or business models• The user perspective is lacking• Certification of equipment is very slow• Focus towards results to be delivered and documented to EU rather than actual implementations and impact

Strengths

The strengths of the SWOT are the beneficial factors that are internal to the project. The strengths of the Maritime Cloud can be divided into four overall categories. A strong focus on the maritime industry, substantial resources to develop the MC, a good overall timing as well as a strong focus on harmonized solutions and scalability of the concept.

There are many cloud systems being developed. However, the specific focus on the shipping industry and reducing the administrative burden are strengths for the work carried out in the project.

The project has a substantial budget of over 10 million EUR which gives a vast amount of human resources for the development activities. At the same time the support from the European Union gives the project an official stamp. Both represent strengths for the development and acceptance for the MC.

The overall timing is good since the Maritime Cloud is “happening” anyway. The maritime sector is generally lacking behind other sectors in terms of ICT implementation, e.g. compared to the aviation industry. There are many outdated administrative procedures that require manual routines and a lot of the IT equipment is obsolete. The fast technological developments create new opportunities at a low cost since it is possible to learn from other sectors and build on existing solutions.

The project builds on open source and technically neutral solutions. Even though this will create resistance from some of the commercial players it also makes it easier to scale the solutions and help gain the acceptance from the broader maritime community.

Weaknesses

The weaknesses describe the negative factors that are internal to the project. The weaknesses of the Maritime Cloud can be divided into four overall categories. These are: a too broad scope of the project, no clear commercial need or business case, ancient gear on board on ships and too many data formats and standards.

The EfficienSea2 project is too broad and ambitious. There are many different components being developed and tested and many partners involved in this work. Even though the project has substantial budget the broad scope is a weakness in order to develop specific solutions that actually will have an impact.

There is no clear commercial need for the Maritime Cloud and it is furthermore difficult to sell the concept to the industry since there is no operational demo version of the concept at the present. Even though the Danish Maritime Authority has a lot of competence within the ICT area, it is not the core business of an authority to develop business oriented systems. At the same time there is no regulative incentive to promote the concept since the approach is to promote the business opportunities and efficiency rather than safety. The business case for MC is therefore rather unclear. This constitutes a large weakness towards securing industry uptake.

Not all ships operate with sophisticated and integrated ICT infrastructure. Furthermore, there are many different systems and data formats that are used in the industry. This makes it difficult to create a solution that will work across the industry and be adopted globally.

There is a weak collaboration with other projects in the area and synergies as well as co-creation are rather limited. At the same time there is a limited branding of the maritime both in EfficienSea2 project,

but also in collaboration with other projects. This represents mayor barrier for the development and adoption of the MC.

Opportunities

The opportunities of the SWOT are the beneficial factors that are external to the project. The opportunities can be divided in to three overall categories: technological opportunities, collaboration with existing stakeholders and initiatives, as well as a strong focus on the business opportunities.

The Maritime Cloud can create a common platform for business development that service providers, producers of maritime IT equipment and related firms can use to reach a broader market. This platform can have a larger number of users than similar clouds developed by individual firms. However, it is important that the Maritime Cloud build on existing technologies and standards since there is no need to develop new and costly technologies that have already been developed and adopted in other sectors. Furthermore, it is important to be technology neutral so that the concept can be deployed at a global scale despite new technological developments and regional interests.

The MC has already gained momentum. However there is a possibility for boosting the development further by collaborating closer with other stakeholders. This includes collaborating with mayor commercial players such as e.g. IBM, Ericson and GS1, learning from their experiences. It also includes collaboration with existing initiatives and projects. One of the large potential takers of the projects results are China, Korea and Japan.

It is important to focus on the benefits that the system will bring in order to create possibilities for the development of the MC. Some of the interesting areas are: Reducing the administrative burden by automated updating, ensuring reliable data without human involving and integration with hinterland transport and Supply Chain connectivity. Furthermore, to focus on increased safety could be an opportunity since e.g. 85% of all accidents are related to the human element and safety at sea could prove to become a key enabler.

It was recommended to the project that a strategic roadmap should be drafted, to indicate what needs to be achieved first, what could be achieved by other or future projects, and to isolate items not to be progressed by the EfficienSea2 project, in order to sharpen the focus of the project.

Threats

The threats are negative factors that are external to the project. The threats can be divided in to four overall categories: Cyber security, resistance from other stakeholders, lack of results from previous projects and organizational changes at the DMA.

Most participants at the workshop mentioned that the greatest threat of all to the adoption of the MC is cyber security issues. In recent years increasing attention has been given to commercial threats as well as terrorism and pirate attacks. This includes issues such liability and insurance by using the system and ownership of data. Even though the shipping market is highly competitive and transparent there is a general trend across industries towards decreasing openness due to cyber risks.

There are many actors such as ship owners, ports, ship agents, international organizations, authorities, projects and related initiatives that have to be involved in the development of the maritime cloud. Event though these actors can help creating synergies they also represent a threat that can block for the development and adoption. Many stakeholders have contradicting interests and there are many “small

kingdoms” which are unwilling to give away power or business opportunities voluntarily. At the same time the system has to work together with many other IT systems, data formats etc. which together with a lack of a clear business and governance model represents a major threat.

Furthermore the lack of results of previous projects and initiatives such as the single window will create skepticism. Even if major stakeholders should be willing to go ahead with the MC the slow procedure of certification in the maritime community will represent a threat for hindering the development.

Finally the DMA is experiencing organizational changes since the headquarters will be relocated from Copenhagen to Korsør by the end of 2017. Many employees will most likely leave the DMA during the next 18 months. There is a risk that the development of the MC in the EfficienSea2 project will lose momentum due to a “brain drain” at the DMA.

5. Governance models

Is there a need for governance?

Some members of the HLUG expressed the view, that there might be no need for a governance body for the MC. However, most participants agreed that it is very important to make sure that the information coming from the MC is trustworthy since security is important for the deployment of the system. At the same time the MC will require hardware and software components, and it will therefore be necessary to provide funding to cover such costs. The most likely setup for the MC will be a mixture of private and public data and services on the same system, which the governance model needs to accommodate. Someone will need to be responsible for granting access to the various users and services, and create interfaces and rules based on standards.

Need for a global approach

Since the maritime industry is highly globalized with ships operating all around the world it is imperative that the MC builds on a global governance structure. There was consensus among HLUG representatives regarding that the MC should not be governed by national or regional bodies such as the European Union. Many suggested that the MC should be independent, while most agreed that it should be governed by IMO if an authority should be the governing body; although this might not be without its own challenges.

Business as a driver

The best way to proceed with the development of the MC is to develop a service registry and let the commercial players provide independent services to the maritime industry. The independent approach could be strengthened by letting the classification society's play a role in certifying developers, equipment and services based on international standards. Classification societies have often a greater competence within approval of equipment than national or international authorities and might therefore be the right choice for certification of the MC components.

A federated governance model

Several find that a structure of federated services on the MC could be the best way forward. The MC could act as a registry or “yellow pages” with physical servers being placed in different locations. This could help solving issues regarding where to place servers, since some countries will be reluctant to accept having physical databases in other countries.

On the other hand LRIT is based on a lot of data centers which is driving a excessive costs. It is therefore important to find a balance between political acceptance, the amount of data centers servers in the system, and costs.

One possibility is to have different governance bodies for different parts of the registry. This way the system could be flexible and accommodate both private and public content as well as national and regional authorities and their interests.

Need for continuity

Even though the EfficienSea2 project has substantial funding, it is important to find a governance body that can undertake the work on a permanent basis. One of the problems that often occur with projects is that they finish and die. It is not possible to build the MC within the framework of the project and then expect someone to use it. It is important to find a stakeholder that can maintain the MC after the project finishes.

6. Business models

There are two mayor issues to be resolved when it comes to the creating a sustainable business model for the MC. One is how to finance the development and operation of the MC itself. The other one is to secure the income of the companies which are providing services on the MC. Both issues are closely interlinked.

How to start the MC?

Ship owners are often perceived as being conservative when it comes to adopting new technologies. It is therefore important to have a good business case and show value before trying to sell the concept to the users. Otherwise it will not “take-off”. One way to start it is to create a specification and a living reference model of the MC and continue extending the system as users increase. It should be considered to “stay business only” and be service oriented and have no safety-critical issues as this will slow down the work. The MC could start as a business platform with few features and define links and standards to other systems later on.

Business models for the Maritime Cloud?

It is doubtful if users will pay for being part of the cloud framework itself. This is perceived as basic infrastructure which does not create value. One way to finance the MC could therefore be to collect a small transaction fee from the users when they use the MC. This could be done by letting service providers pay the fee to the system administrator. Another model for financing the MC could be to have a subscription model where you subscribe to the platform and get all the services. A third model could be to let the ports and other service providers pay for providing services to their users. It is essential for creating a sustainable business model for the MC to identify the services that are going to part of the system.

Several members of HLUG find that there will be a great interest for paying for the messaging service in the MC. Furthermore, the team behind the US conference e-Navigation Underway are interested in having a global standard for navigational warnings. This could be an enabler for the MC. Reducing the administrative burden by automated reporting could be another one.

It is important to make it possible for users to choose various suppliers of similar services that are based on the same standards in order to secure vendor independency. At the end of the day the ones who pay for the services will be the ones who control the datacenters, and it is therefore important to think the business models through when developing the framework and governance model for the MC.

The aviation industry as inspiration?

One of the cases that are often discussed as inspiration for the maritime industry is the aviation industry. However, shipping is overall doing well in terms of safety and there is no need for implementing a heavy control and information system similar to aviation in the maritime domain. The aviation industry should not act as a raw model for MC. We need to create a structure that is appropriate for the shipping industry.

7. Legal aspects

There are two possible drivers for adopting the MC. One is to create business value and voluntary market uptake. The other one is by regulative requirements and mandatory measures such as demanding that ships use the MC to increase safety. The overall recommendation of HLUG is that business value is more suited as a driver than regulation.

Safety and regulation as drivers

The legal aspects are far more important if the system and services are related to safety and compliance with requirements from authorities. In this case you will need trusted ID and be sure that the data is reliable. However, when you put safety critical issues into the system, you bring in heavy legal aspects and regulations into play. This makes it very slow to get the systems approved and might block the development of the MC.

When it comes to regulative measures, the requirement for Single windows and Safe Sea Net could be a driver to implement the MC. One possibility could be for the ship owners to see an opportunity to integrate various systems that they use already into one. However, a problem might be that companies will be concerned that internal and commercially sensitive information is shared, thus we need standards and independent suppliers.