



Deliverable D1.28 Workshop Report

How to Run the MCP (Maritime Connectivity Platform)

Paris, 21 to 22 November 2017

27 November 2017



Executive Summary

A workshop on How to Run the MCP (Maritime Connectivity Platform) was hosted by IALA on behalf of the EfficienSea 2 Project from 21st to 22nd November 2017. The workshop was attended by 52 delegates, representing 19 countries.

Noting that the EfficienSea2 project funding from the EU ends in April 2018, the objective of the workshop was to address the implementation of the MCP with a focus on identifying preferred governance and business models and preparing a related exploitation plan for global information exchange. Legal and Liability issues were also explored. It was anticipated that the workshop would provide participants with a good understanding of the MCP concept and develop a forward plan for its globalisation.

Work carried out

Following a series of presentations participants worked in four working groups to consider the governance model, the business model, the implementation plan and the legal and liability issues of the MCP.

Key outcomes from the workshop include:

The workshop produced a report, including 35 conclusions, with the following highlights.

- The MCP and its technical components are in general seen as a good contribution in the maritime domain;
- The MCP is expected to take down barriers of language and communication, it will be a platform for new business opportunities. The strengths are the introduction of standards, inter-operability and the support of international associations;
- Barriers working against the MCP are future funding, competition from other proprietary systems, immaturity of the system, maritime community support and making good sales argument for switching to MCP;
- There is a need to investigate the most appropriate way to promote the MCP in international bodies;
- A form of partnership arrangement comprised of public and private sector involvement is preferred to a purely commercial or state model;
- Governance of the MCP might best be arranged at more than one level to address the various issues involved;
- The MCDF (Maritime Connectivity Platform Development Forum) is an essential stepping stone toward establishing governance arrangements by ensuring technical consistency through related projects (EfficienSea2, STM, SMART-Navigation);
- Regulated systems need to be managed through international standardisation bodies while non-regulated systems can be handled by competent authorities / companies;
- The selling points of the MCP are the provision of infrastructure and free services offered as well as (easily implemented) paid services. It should focus on end-users and the provision of services;
- Funding should be in place to proceed first with EU/governmental support, then later with a sustainable business model in the market;

- Getting attractive services and “apps” on the platform is critical in the short term. In the long term the MCP must be included in key frameworks by e.g. the IMO and ITU;
- The intellectual property rights supporting the MCP are open source, so there are no apparent IPR issues for the envisaged development and operation of the MCP;
- The terms of use should contain a choice of law clause, as this will ensure legal certainty with respect to liability, and thereby enable the MCP to function across jurisdictions without the risk of being subjected to unexpected liability;
- There is a significant body of international regulation applicable to maritime matters, including safety and communication regulation. The compliance with such regulation, will have to be explored further.

The output from the working groups will be used to update the draft Maritime Connectivity Platform Business Case, which will form part of an EfficienSea2 Recommendation on the Governance and Business Model for the MCP (D1.6) and will provide input to other related EfficienSea2 work.



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Review

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Introduction

A workshop on How to Run the MCP (Maritime Connectivity Platform) was hosted by the International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) in Paris, France from 21st to 22nd November 2017. The workshop was attended by 52 delegates, representing 19 countries. A list of participants is shown in ANNEX B.



Overall Programme

The workshop programme is shown in ANNEX A.

Conclusions

The workshop reached the following 35 conclusions.

General

1. The MCP and its technical components are in general seen as a good contribution in the maritime domain, but it is recognised that success does not come automatically by just having a technical platform in place. Finance, acceptance, structure, legal framework, market, processes and future vision for continuous development of the MCP need to be secured.
2. MCP is expected to take down barriers of language and communication, it will be a platform for new business opportunities. The strengths are the introduction of standards, inter-operability and the support of international associations.
3. Barriers working against the MCP are future funding, competition from other proprietary systems, immaturity of the system, maritime community support and making good sales argument for switching to MCP.
4. There is a need to investigate the most appropriate way to promote the MCP in international bodies.

Governance and regulation

5. A form of partnership arrangement comprised of public and private sector involvement is preferred to a purely commercial or state model.
6. To ensure all-important trust in the identity registries, the root-level identifier and related rules would ideally be established and maintained by ITU.
7. Governance might best be arranged at more than one level to address the various issues involved in the operation of the MCP including financial, operational, technical, standard-setting, etc., overseen by a Governing Body.
8. The stakeholders in governance should include associations representing users (service providers and consumers) and maintain the principle of service neutrality (net neutrality).
9. The MCDF is an essential stepping stone toward establishing governance arrangements by ensuring technical consistency through related projects (EfficienSea2, STM, SMART-Navigation).
10. To ensure success, the MCP must have one logical instance and is likely to have multiple physical instances, implemented globally.
11. The standards required for the global/top level of the MIR and MSR will rest with the GE (Governance Entity) (while the root certificate will fall under ITU).
12. Local entities acting e.g. on a national basis may develop and maintain instances of MIR and MSR, subject to the terms and requirements of the GE. Having this activity carried out at national level is viewed as a requirement in order for some governments to adopt the MCP.
13. Regulated systems need to be managed through international standardisation bodies while non-regulated systems can be handled by competent authorities / companies.

Business Model

14. The business model for the MCP should reflect how to become a competent authority / company
15. The selling points of the MCP are the provision of infrastructure and free services offered as well as [easily implemented] paid services. It should focus on end-users and the provision of services.
16. In the context of existing solutions (in other domains), the unique features of the MCP could be the provision of a maritime secure platform for authentication and certification.
17. Regular audits of trusted organisations are a potential part of the business model for the MCP Governing Entity. The MCP should ensure quality of information. MIR enables the verification of (safety related) information.
18. Funding should be in place to proceed first with EU/governmental support then later with a sustainable business model in the market.
19. A continuous development of services should be ensured, so income can be reinvested in further development.



20. Getting attractive services and “apps” on the platform is critical in the short term. In the long term the MCP must be included in key frameworks by e.g. the IMO and ITU.

Legal & Liability

21. The intellectual property rights supporting the MCP are open source, so there are no apparent IPR issues for the envisaged development and operation of the MCP.
22. The terms of use should contain a choice of law clause, as this will ensure legal certainty with respect to liability, and thereby enable the MCP to function across jurisdictions without the risk of being subjected to unexpected liability.
23. To the extent liability is accepted for MIR, suitable insurance would have to be taken out by the GE, or a mutual form of insurance for SPs and SUs could be established.
24. A failure by the GE in relation to the MIR / MSR standards may cause disruption to an SU's commercial operation, which may in turn cause losses for third parties (e.g. non-users of the MCP). The general view is that the GE will not be subject to liability towards such third parties for loss/damage incurred in this regard.
25. The use of the MIR and MSR will be available for all SPs and SUs, but the relevant SP/SU should be required to accept GE's terms of use (e.g. when the SP/SU registers in an MIR). These terms will govern the GE's potential liability towards SPs and SUs. The GE's liability for the MIR and MSR should be excluded entirely where possible – except, perhaps, liability for the authentication services under MIR, in order to promote trust in the MCP.
26. To ensure that local entities operating MIR, MSR and/or MMS manage their activities in a safe, secure and efficient manner, a set of rules should be drafted containing the standards of the GE. The local entities would need to comply with these rules, and if they breach them, they may be excluded from the MCP. Where the local entity's breach results in a loss for an SP/SU, and if the SP/SU brings a claim against the GE, the rules should contain an obligation for the local entity to indemnify the GE against the claim.
27. If a business/governance model is adopted for the MCP whereby SPs and SUs contract directly with the local entities for the use of the MIR, MSR and/or MMS provided by the local entity, then suitable terms of use for local entities should be drafted.
28. Alternatively, (and this would seem to be the preferable option), it should be ensured that SPs and SUs contract with the GE, and only the GE, for the use of the MIR, MSR and MMS. No contract will be entered into between the local entity and the SP/SU, and therefore contractual liability for the local entities will not arise. If this option is used, the terms of use of the GE should be amended accordingly. The fact that some of the standards/functions/services are not provided by the GE, but by the local entities, does not change this.
29. As for federated identity registries with elements provided by external registries, the relevant external registry will be liable for authentication failures etc.
30. Local entities providing MMS may potentially be subject to criminal liability for transmitted information. The liability can be mitigated by having the SPs and SUs provide indemnities



(under the terms of use) for any liability (criminal or civil) arising due to the information transmission by the SPs/ SUs.

31. There is no immediately clear position with respect to logging of data and/or activity by the GE and/or the local entities for MIR, MSR and/or MMS. Such logging of activities may be required by relevant regulation, but it may also subject the relevant activity to data protection regulation. Further, it may be preferable from a commercial point of view in relation to payment by SPs and SUs.
32. The view is that the GE will not be involved in storage of sensitive data – if so, data protection regulation will not apply to it. However, local entities providing MIR functions and entities responsible for federated registries may be subject to data protection regulation, as they will be potentially be storing sensitive information. The same applies for local entities providing MMS functions.
33. There is a significant body of international regulation applicable to maritime matters, including safety and communication regulation. The compliance with such regulation, will have to be explored further, including whether such regulation will apply to the GE and/or the local entities, or only to the SUs and SPs.
34. It was noted that conclusions 26, 27 & 28 need to be explored further by the MCDF.
35. It was recommended that the input documents E2MCPSW-4 and E2MCPWS-7 to the workshop be consolidated, taking into account the outcome of the working groups, as appropriate.

Session 1 Opening of the Workshop

Chaired by Nick Ward, IALA EfficienSea2 Project Manager.

All presentations form part of the output of the workshop.

Welcome from IALA

Noting some familiar and some new faces, Francis Zachariae, Secretary General of IALA, welcomed all participants to IALA. He noted that IALA has 37 new members over the last few years bringing IALA membership to 227. IALA is proud to be contributing to EfficienSea2 and to host this workshop. He thanked Nick Ward, IALA EfficienSea2 Project Manager for his hard work. He considered that the EfficienSea2 project is good for IALA and its members, for the EU and for the e-navigation project.

Welcome from EfficienSea2 Co-ordinator, Bjørn Pedersen, DMA

Bjørn Pedersen, DMA and EfficienSea2 Project Co-ordinator, welcomed all the participants. He thanked IALA for hosting the workshop. He recalled how the MCP started with the idea of linking all maritime infrastructure through a new generation digital architecture. The project has been running for three years and 15 end user services are envisaged on completion. Testing of the MCP is in progress in 300 ships and is progressing well. A short video which is available at https://youtu.be/hkaWy_ekQu4 was shown. Paper E2MCPWS-P1.1 refers.

Administration & Safety Briefing, Seamus Doyle, IALA

Seamus Doyle presented an administration and safety briefing. Paper E2MCPWS-P1.2 refers.

Workshop aims, objectives & structure, Nick Ward, IALA

Nick Ward set out the aims, objective and structure of the workshop. Paper E2MCPWS-P1.3 refers.

Session 2 –Purpose, Structure, Core elements of MCP

Chaired by Thomas Christensen, DMA.

MCP Overview, Thomas Christensen, DMA

Thomas Christensen presented the background for the development of the MCP. He gave an overview of the platform, the status of the work, and the current organisational setup including the MCDF (Maritime Connectivity Platform Development Forum). V0.6 of the MCP has been in operation since May 2016 and the V0.7 release is due in December 2017. The purpose of the overview, together with the following three presentations (ID registry, service registry, messaging service) was to educate the participants about the MCP, in order to facilitate a qualified discussion on governance and business model. Paper E2MCPWS-P2.1 refers.



The key points of the presentation were:

1. General overview of the MCP.
2. Historic background.
3. Current status and plans.
4. Current organisational setup.

Maritime Identity Registry and cyber security, Thomas Christensen, DMA

Thomas Christensen went a bit further into the details of one of the core components of the MCP, the identity registry. He focused on the functionality, structure and cyber security aspects of the identity registry. Paper E2MCPWS-P2.1 refers.

The key points of the presentation were:

1. More details on the identity registry.

Service registry, Christoph Rihacek, FREQUENTIS

The Maritime Service Registry (MSR) is one of the Maritime Connectivity Platform (MCP) core components and is supposed to serve as a central reference point to provide and find services and thus to improve the visibility and accessibility of available information and services in the MCP. It is best compared with a yellow pages phone book. The MSR is intended to provide technical functionalities for registering, discovering and using all relevant e-navigation and e-Maritime services, commercial and non-commercial,



authorised (e.g. by IMO) and non-authorised. Mr Rihacek introduced the different functions of the MSR, user roles and its technical infrastructure. Furthermore, he addressed technical issues of how to specify (technical) services. He finished with an overview of the current state of development of the MSR and which instances of the MSR are already available. Paper E2MCPWS-P2.3 refers.

The key points of the presentation were:

2. Maritime Service Registry.
3. Service Documentation.

Messaging service, Jin Park, SMART-Navigation Project

The Maritime Message Service (MMS) of the MCP is an inherent service which will be registered on the MSR. The MMS has three main revenue generation functions: (1) navigation messenger, (2) data roaming between maritime communication links, and (3) digital service call brokerage. Firstly, as a navigation messenger, the MMS enables the users with their ID on the Maritime Identity Register (MIR) to exchange messages. Secondly, the data roaming function of the MMS makes it possible to exchange information between heterogeneous physical links in various casting modes by using maritime IDs registered on the MIR, enabling machine-to-machine data communication on a global scale. This means that the MMS enables intelligent exchange of information between communication systems connected to the MCP, taking into account the current geographical position and communication links available to the recipient. Thirdly, as a trustworthy digital service broker, it relays a service request on behalf of a Service Consumer (SC) and relays response from a Service Provider (SP) to the SC. A SP regards the MMS as a trusted delegation of the SC who requested a service via the MMS. In reality, the MMS could have multiple instances that would have been registered on the MCP Service Registry. MMS instances could be provided by authorities or third party service providers such as a satellite communication service provider. The MMS is developed within the SMART-Navigation project. Paper E2MCPWS-P2.4 refers.



The key points of the presentation were:

1. The Maritime Message Service (MMS) of MCP is an inherent service which will be registered on the MSR.
2. The MMS has three main revenue generation functions: navigation messenger, data roaming between maritime communication links, and digital service call brokerage.
3. In reality, the MMS could have multiple instances that would have been registered on the MCP Service Registry.
4. The MMS is developed within the SMART-Navigation project.

Discussion

In discussion it was pointed out that Chinese trials of the MCP have indicated that it is too slow and several synchronized instances may be required. This is being considered.

The Maritime Identity Register may be used on its own.

Responding to a query regarding the scope of the workshop and the ontology of the MCP, it was stated that an objective of the workshop was to develop a suggested route for development of the MCP after the EfficienSea2 project and how to apply the MCP to maritime business.

The benefit of the MCP is for the end user (human or machine) to discover and access digital information streams easily. Similar to Google, the MCP should be transparent. The MCP provides a service provider with a framework (human or machine) to deliver service simply with access to the whole maritime market at the same time.

Session 3 – Governance and Business Model Options

Chaired by Andy Winbow, CIRM.

Governance and Business models, Andy Winbow, CIRM

Andy Winbow reviewed possible governance and business models including the currently preferred way forward as agreed at the Warsaw S2 meeting in March 2017. Paper E2MCPWS-P3.1 refers.



The key points of the presentation were:

1. Governance models.
2. Business models.
3. General direction of travel for governance of the MCP.

Other maritime information systems initiatives worldwide, Ernie Batty, IMIS Global Ltd

The impact of Maritime Information Systems on berth to berth voyage management is significant from a safety, security, environmental protection and economic benefit perspective. These systems have migrated from a lookout and paper-based systems to enterprise cloud environments with well-developed reporting, data analytics, event management and machine learning.



The term Maritime Information System (MIS) is wide ranging and normally describes an electronic maritime information gathering, processing storage and distribution system with the information coming from a wide range of sources.

Referring to MariWeb, Mr Batty considered that the provision of MIS as a service is complex, primarily due to the breadth of scope and the wide range of technical and performance standards that apply to MIS. These specification and operational requirements are often significantly extended by national and port specific requirements.

From the IMIS experience, the prime considerations in the deployment and operation of a MIS are:

1. Availability.
2. Failure response (Service Level Agreement).
3. Standards compliance.

4. Increasing data.
5. Unique feature requirements.

The concerns raised by customers are primarily as follows:

1. Data accuracy and associated liability and audit capability.
2. Pricing.
3. Data ownership and cost of collection.

Paper E2MCPWS-P3.2 refers.

The key points of the presentation were:

1. MIS and port management systems have migrated from paper to local systems, often based on simple spreadsheet or database applications and are now migrating to enterprise level cloud environments with well-developed reporting, a wide range of data analytics, complex event management, machine learning and comprehensive reporting tools.
2. Cloud based solutions enable small regional, national and port authorities to gain low cost access to enterprise features and reliability.
3. The long history of the maritime industry results in each customer, authority and provider having specific views of how MIS are to be implemented, tested and operated.
4. Availability, support, cyber security, compliance to published standards and quality of service along with competitive pricing drives the value proposition.
5. Artificial intelligence (AI) is being used to mount cyber attacks and AI systems learn, hence AI must be used to combat cyber threats.

Discussion of options for governance of the maritime connectivity platform

Considering the commercial opportunities of the MCP, it was stated that commercial interests only need to answer to customers, not governments.

It is important to use open standards but this may not be acceptable to governments.

The MCP is a commercial venture and it is necessary for the governing body to avoid a conflict of interest.

The function of the MCP is to connect services to customers and it does not provide or store the service provided. This enables the MCP to be small with minimum cost of provision.

33% of the cost of a service provision systems is hardware and management costs while 66% of the cost is day to day support of systems.

KPI requirements for current operational service provision is 15 minutes maximum outages. It is necessary to consider who will carry the cost of MCP outages and who will ensure that the system is restored.

Operational requirements will be considered under the discussion of legal and liability issues relating to the MCP. A parallel could be drawn with the internet service provision. It was pointed out that an internet VPN service provider uses triple redundancy with a service level agreement, which costs a lot.



It was pointed out that service availability for shore based customers can be very different to the availability that can be provided to ships where harsh and remote environments affect communications. High availability implies high cost.

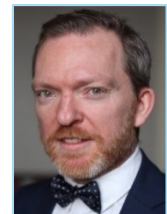
The shipping industry needs a system that is trustworthy and that works.

Responding to a question regarding the feasibility of mesh functionality (communications linking from ship to ship) it was stated that Robert Tremlett had provided such information in the past to an IALA committee.

Responding to a question about the relative cyber vulnerability to hacking of open source systems, it was stated that some governments do not accept open source for secure services. While open source is considered to be more vulnerable by some, Apple is based on open source UNIX. Open source is also use in the popular Apache system. The ability of an open source system to tolerate hacking depends on the community size. It was felt that the MCP may have to move to a closed system in the future if cyber security becomes an issue.

Implementation plan – roadmap and action plan, Mikkel Hansen, Maritime Development Center

In preparation for the working group session on day 2 of the workshop, Mikkel Hansen focused on the development of an implementation plan for the MCP and endeavored to reveal various obstacles and how they can be overcome.



He also introduced the concept of two innovation workshops, hackathons, which will be held during the first months of 2018 in order to develop prototypes for the MCP. Paper E2MCPWS-P3.4 refers.

The key points of the presentation were:

1. Workshop roadmap and action plan introduction.
2. Hackathon introduction.

Focus group study with service providers, manufacturers and ship owners, Yemao Man, Chalmers University of Technology

Yemao Man is investigating the values of the MCP. Previously he has conducted two focus group studies with service providers, manufacturers and ship owners. He compared the MCP to the telephone yellow pages. He sought to establish the views of workshop participants of the concept, value, and challenges of the MCP.



Establishment of the value of the MCP would be limited without participation from stakeholders from outside Mr Man's research consortium. Therefore it is important to study how the MCP works and how the development of MCP impacts stakeholders' business. Workshop participants were asked to fill in an online mobile questionnaire regarding various aspects of the MCP. The questionnaire is available at <https://goo.gl/ckDAEn> for Authorities and at <https://goo.gl/gbpLVJ> for service providers /manufacturers / ship owners. The aim was to gain their general feedback of MCP's intended values, to generate insights on the

opportunities and challenges for the MCP development. Results of the survey will be available in the future in a peer review article. Paper E2MCPWS-P3.5 refers.

The key points of the presentation were:

1. Establish participant feedback of the MCP's intended values.
2. Generate insights on the opportunities for the MCP development.
3. Generate insights on the challenges for the MCP development.

Establishment of working groups

The workshop broke into four Working Groups (WG) to discuss the issues surrounding the MCP. WG1 and WG2 worked on day 1 while WG3 and WG4 worked on day 2.

WG1	Governance model Objective: Preferred option for governance model and timeline	Leader: Andy Winbow
WG2	Business model Objective: Preferred option for business models with pros and cons. Exploitation plan with success criteria	Leader: Benjamin Weinert
WG3	Implementation plan Objective: Roadmap and action plan	Leader: Mikkel Hansen
WG4	Legal and liability Objective: List of anticipated legal and liability issues. Possible solutions for legal and liability issues.	Leader: Christian Benedictsen-Nislev

Presentation of WG outputs

WG1 - Governance model

WG1 met on day 1 and generated the following conclusions.

- 1 A purely commercial governance arrangement (company model) is not considered appropriate, nor is a purely State model.
- 2 Some form of partnership arrangement comprised of public and private sector involvement is preferred.
- 3 To ensure all-important trust in the identity registries, the root-level identifier and related rules would ideally be established and maintained by ITU.
- 4 Governance might best be arranged at more than one level to address the various issues involved in the operation of the MCP including financial, operational, technical, standard-setting, etc., overseen by a Governing Body.
- 5 The stakeholders in governance should include associations representing users (service providers and consumers) and maintaining the principle of service neutrality (net neutrality).

- 6 The MCPDF is an essential stepping stone toward establishing governance arrangements by ensuring technical consistency through related projects (EfficienSea2, STM, SMART-Navigation, etc.).
- 7 To ensure success, the MCP must have one logical instance and is likely to have multiple physical instances, implemented globally.
- 8 There is a need to investigate the most appropriate way to promote the MCP in international bodies.
- 9 It was recommend that the input documents to the workshop be consolidated, taking into account the outcome of the working groups, as appropriate.

The following timeline was proposed.

November 2017	MCP Workshop in IALA
Early 2018	Agreed plan on MCDF 2.0 between ES2, STM and SMART partners, and possibly others.
	Interim Governing Body inaugurated.
April 2018	EfficienSea2 project ends.
Late 2018	MCP running technically operationally. Operated by SMART-navigation project.
	Seek financial support, if needed.
	Submit a question to the ITU.
	Prepare a draft report on MCP to appropriate ITU. Working Party and/or ITU/IMO Joint Experts Working Group.
End 2018	STM project ends.
Mid 2019	Final MCP governance and operations in place.
End 2019	Capacity-building activities to commence.
End 2020	SMART-navigation project ends.

WG2 – Business model

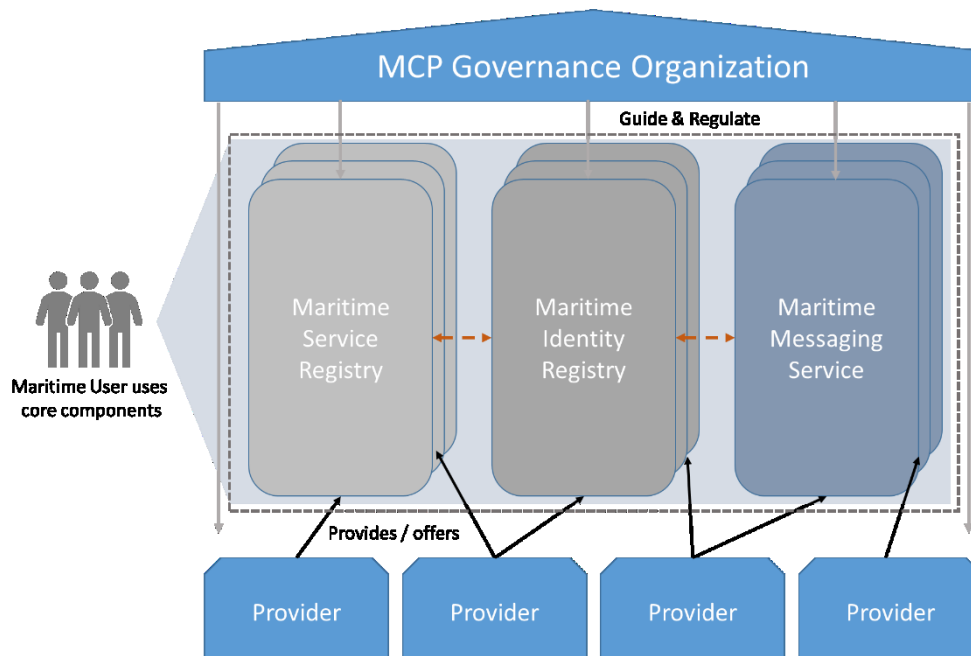
Objective

The tasks and knowledge transfer within this working group were as follows:

- Introduction to the general aspects of MCP.
- Classification of key MCP components in the business context.
- Identification and description of stakeholders.
- Preparation for future business models.

Introduction to the general aspects of MCP

The basis for this working group was the *Maritime Connectivity Platform Business Case Document*, provided from ES2 WP1. The starting point was the discussion of a generic overview of the structures of the MCP (see figure below) in order to achieve a common understanding about the relations within the MCP.



Classification of MCP key components

Based on the provided documents, the MCP key components are discussed in a business context. This was intended to harmonise the different information levels of the participants. The following were discussed:

- The Maritime Identity Registry and already identified revenue generation methods.
- The Maritime Service Registry and already identified revenue generation methods.
- The Maritime Messaging Service and already identified revenue generation methods.

Besides this, it was outlined that Service Providers (SPs) can run different instances of MSR, MIR and MMS but also for further technical services. The discussion considered if those components should be reflected in a general business model jointly or separately. The participants stated that the willingness to pay is dependent on the usability of the MSR. The benefit of the MSR is the discoverability of services by the Service Consumer (SC). The benefit from an economic perspective for a federated identity registry should be clarified during the definition of the MCP business model.

Identification and description of stakeholders

The session continued with the identification of internal and external stakeholders of the MCP. This was done via round table discussion. A classification scheme was provided in order to capture stakeholders details such as interests, needs and roles in connection with both the MIR and the MSR. The resulting stakeholder list extends the already identified stakeholder in the above-mentioned deliverable from ES2 WP1. The list describes the stakeholders in a more specific way and combines them with the user-roles such as Service Consumer, Service Provider and others (see ES2 WP3 D3.7 Technical Specification of the Maritime Cloud). While discussing the stakeholders it was noted that the production and registration of a service specification should be in the responsibility of a recognized international organization.

Preparation for future business models

This part of the session of WG2 was to contextualize the stakeholders with the functionalities of the MSR and MIR. For this, a generic business model canvas sheet¹ was used. The participants split up in two groups, one for each component. As a result, a set of potential key partners and customers for the MSR and MIR are identified.

During this, different options for value propositions are discussed. Besides the general values based on the technical functions of the MSR and MIR (Discover service, authenticate maritime entity), it was discussed if a once trusted party (e.g. a Service Provider) can be always trusted. One potential part of the business model would be to integrate continuously audits, given by the MCP-foundation to generate revenue and to provide trust between organizations within the MCP.

Further value propositions for the MIR could be:

- Access management to provide ability for the protection of sensitive data;
- Authentication, verification, validation based on the main functionalities of the MIR;
- Establishment of trustworthiness of (registered) maritime entities.

For the MSR, it was stated, that the discovery of services and the provision of existing service specifications are the potential key features.

(Further) input from the participants

- The MCP and its technical components are in general seen as a good contribution in the maritime domain;
- Trust of parties: Is a once trusted party always a trusted party?
- Need to be handled within a future MCP-Foundation;
- Regular audits of trusted organizations - potential part of the business model for the MCP-Foundation;
- MCP should support the quality of information;
 - MIR enables the verification of (safety related) information;
 - Who ensures the quality of information?
- Distinguish between the handling for service specifications for highly regulated; systems (or services) and non-regulated systems;
 - Definition of rules for publish service specifications;
 - For highly regulated systems => International standardization bodies;
 - For unregulated systems => Competent authorities / companies;
 - The business model for the MCP should reflect how to become a competent authority / company;
- The selling point is the provision of the infrastructure itself;
- In context of existing solutions (in other domains), the unique features for the MCP could be the provision of a maritime secure platform for authentication and certification;
- The MCP should focus on endusers.

¹ http://nonlinearthinking.typepad.com/nonlinear_thinking/2008/07/the-business-model-canvas.html

Outlook

- Facilitate the feedback from WG 2, based on the excelsheets and notes from the session
- Derivation of cost structure & revenue streams
- Mapping between stakeholders and MCP key activities
- Extend the Maritime Connectivity Platform Business Case Document
- Transition from Research project to sustainable solution
- Alignment of existing technical infrastructure of the MCP with maritime environment
- Precise outline of key features of the MCP

Conclusions

WG2 generated the following conclusions.

- 1 The information level of WG participants seems different: The MCP core components are discussed in more detail in order to align the different perspectives and knowledge bases.
- 2 Potential stakeholders for the Maritime Service Registry and Maritime Identity Registry are identified
- 3 The stakeholders are described with regards to their needs, their interests and their expected roles within the MSR and MIR
- 4 The "selling point" and the value of the MCP in context of existing approaches have to be outlined more.
- 5 The workshop participant identified potential selling points of the MCP.
- 6 Further work should be invested in the development of a business model or business models for MCP. This raises the question of whether the MSR, MIR and MMS should be considered separately or jointly.

WG3 – Implementation plan

The WG aimed at developing an implementation plan and roadmap for roll-out of the Maritime Connectivity Platform (MCP) and to create alignment between stakeholders so that the go-to-market strategy and implementation plan can be most effective.

The WG was attended by approx. 35 attendees as part of the EfficiensSea2 workshop. The attendees came from maritime administrations and authorities, suppliers, universities and intermediates.

The WG considered the following points:

- 1 Vision
- 2 Factors of support
- 3 Identification of barriers
- 4 Develop implementation plan
- 5 Align and prepare presentation

Vision

Participants were initially asked to take some time individually to envision their expected future with the MCP in place at a time 5-6 years from now. The participants noted this down and following this groups were established consisting of approx. 3-4 participants in each. The participants shared their personal vision and following this the discussed and presented a shared vision for their group. The following summarises the visions presented:

- More web services are available and new services are available and communication formats are standardized;
- MCP can facilitate services;
- MCP can facilitate safety related services;
- Voice calls are eliminated and fewer communication barriers;
- Ships can communicate digitally to each other;
- Gaps between SOLAS and non-SOLAS vessels are bridged;
- Language barriers are reduced as vessels communicate digitally;
- Interoperability between systems/vendors are enabled;
- New types of applications are being developed with the MCP in mind;
- Software is redesigned;
- New types of training courses are being build;
- Companies realize new revenue streams;

Factors of support

In the next step, participants were asked to identify factors of support. These are factors which support realising the implementation of their vision for the MCP. Factors could for example be: people, opportunities, technologies, situations, meetings, market, operational, management, financial, etc. After identifying factors individually, they again shared with the groups and the groups were asked to agree on 5 factors and they were noted on post-its and shared with the rest of the audience. The identified factors of support where:

- early adopters;
- universal buy in and acceptance;
- standards;
- the right solutions are not too expensive;
- association and industry support;
- funding and financial support;
- regulatory framework;
- robust communications network;
- free to use system/services;
- pay as you play structure which is straight forward;
- service business model;
- that the system (might be) mandatory.

Identification of barriers

Similarly to the factors of support, the participants identified barriers hindering the realisation of their vision of the MCP. The barriers could for example be people, opportunities, technologies, situations, meetings, market, operational, management, financial, etc. After identifying barriers individually, they again shared with the groups and the groups were asked

to agree on 5 barriers and they were noted on post-its and shared with the rest of the audience. The identified barriers where:

- aligning with current infrastructure;
- funding;
- trust/ranking of services;
- liability;
- regulatory infrastructure;
- support for status quo;
- competing proprietary systems;
- cyber security;
- immaturity of services and infrastructure;
- funding the stakeholders;
- making the sales argument;
- maintenance issues;
- coverage and connectivity.

Implementation plan

Following the above 3 steps, the groups were asked to identify actions in the short (1-2 years) medium (2-5 years) and long term (5+ years) which would support implementation of their vision. The viewpoint was to be all relevant stakeholder with interest in the MCP, so actions in a very broad scope.

Participants were asked to:

- Review input from the workshop (past sessions);
- Ask how do we realize the MCP?
- Do we (in our organization) have the competence to support this?
- Do we need to consider alternatives through dialogue;
- Build consensus;
- Share and communicate.

Below is the matrix of actions (solutions to issues) over time:

MCP realization roadmap // Type of challenge	Short term 1-2 years	Medium Term 2-5 years	Long term 5+ years
Financial	Find money/secure funding	Governments	Industry Organizations Companies
Management	Establish business and governance model Sell the MCP (to a private entity?) Communication plan Define and introduce a foundation for governance (legal/board responsibility taken)	MCP supported by internationally recognized body (ITU, IMO,...) Ensure maintenance and continuous innovation of the MCP	Establishment of self-sustaining community



MCP realization roadmap // Type of challenge	Short term 1-2 years	Medium Term 2-5 years	Long term 5+ years
Operations		Contract MSR and MIR suppliers	
Technical	Get the killer apps up and coming Securing the communication systems in place (technical level VDES etc.) Experts, professionals, technologies, processes in place	Structure and platform in place	Services and security systems
Market	Dissemination activities (conferences, workshops, papers...) Get MIR up and running with relevant processes for adaptation in the market MCP awareness - in the market and sell the MCP	Existence on the market Commercial VDES equipment available	
Implementation issues		Validation and integrity measures implemented in MCP - enforced by a high-level group/governance	
Strategic challenges	Business model included in reports by the project consortium, how are we on the targets (financially)		Existing international legislation, recommendations Implementation of ITU Recommendations on MIR (in 10 years)
Provider value		Populate the service registry by a new project (funded by EU or privately)	
User value			

Conclusion

The framework for an implementation plan, a roadmap, was built. Although it is not possible to complete, but the project has received input and inspiration for the way forward for a successful implementation of the MCP.

The vision statements revealed a number of interesting perspectives, amongst others that the MCP is expected to take down barriers of language and communication, it will be a platform for new business opportunities and that the standards and interoperability are highly valued and will become an important asset for the MCP and the industry as a whole.

The factors of support underlined some of the strengths again being the introduction of standards, the support of international associations and that there will both be free services offered as well as (easily implemented) paid services.

On the other hand, the barriers working against the MCP were, amongst others, the future funding, competition from other proprietary systems, immaturity of the system, maritime community support and making the good sales argument of switching to MCP.

For the implementation plan, a number of actions were identified, first the funding should be in place to continue with initially EU/governmental support then later from a sustainable business model in the market. Having the business model in place is also urged together with ensuring top level authority backing. A continuous development of the services should also be ensured, so income should be reinvested in the further development - new projects could also be the source of this. Getting attractive services and “apps” on the platform is also critical in the short term. On the long term the MCP must be included in key frameworks by e.g. the IMO and ITU.

There was a high level of buy in to the MCP, but also a recognition that success does not come automatically by just having a technical platform in place. Finance, acceptance, structure, legal framework, market, processes and future vision for continuous development of the MCP needs to be secured.

In discussion it was stated that history has proven that the best way to promote the MCP is to provide services using the MCP. Services provided through the STM project use the MCP and perhaps these services could be used to promote the MCP. A killer App has not emerged and is unlikely to emerge at this stage.

WG4 – Legal and liability

Transition to new governance structure

- 1 expiry of EfficienSea II, then STM, then SMART.
- 2 partnership agreement to be entered into by Q2 2018.
- 3 governance structure to be set up.

Some work to be done on these issues at the relevant stages, but no apparent obstacles are envisaged.

Rights to the MCP functionalities/standards

The intellectual property rights supporting the MCP are open source-based, so there are no apparent issues for the envisaged development and operation of the MCP.

Trademark rights should be registered for the relevant trademarks for the MCP (including any logo and e.g. the name). The same goes for relevant domain names.

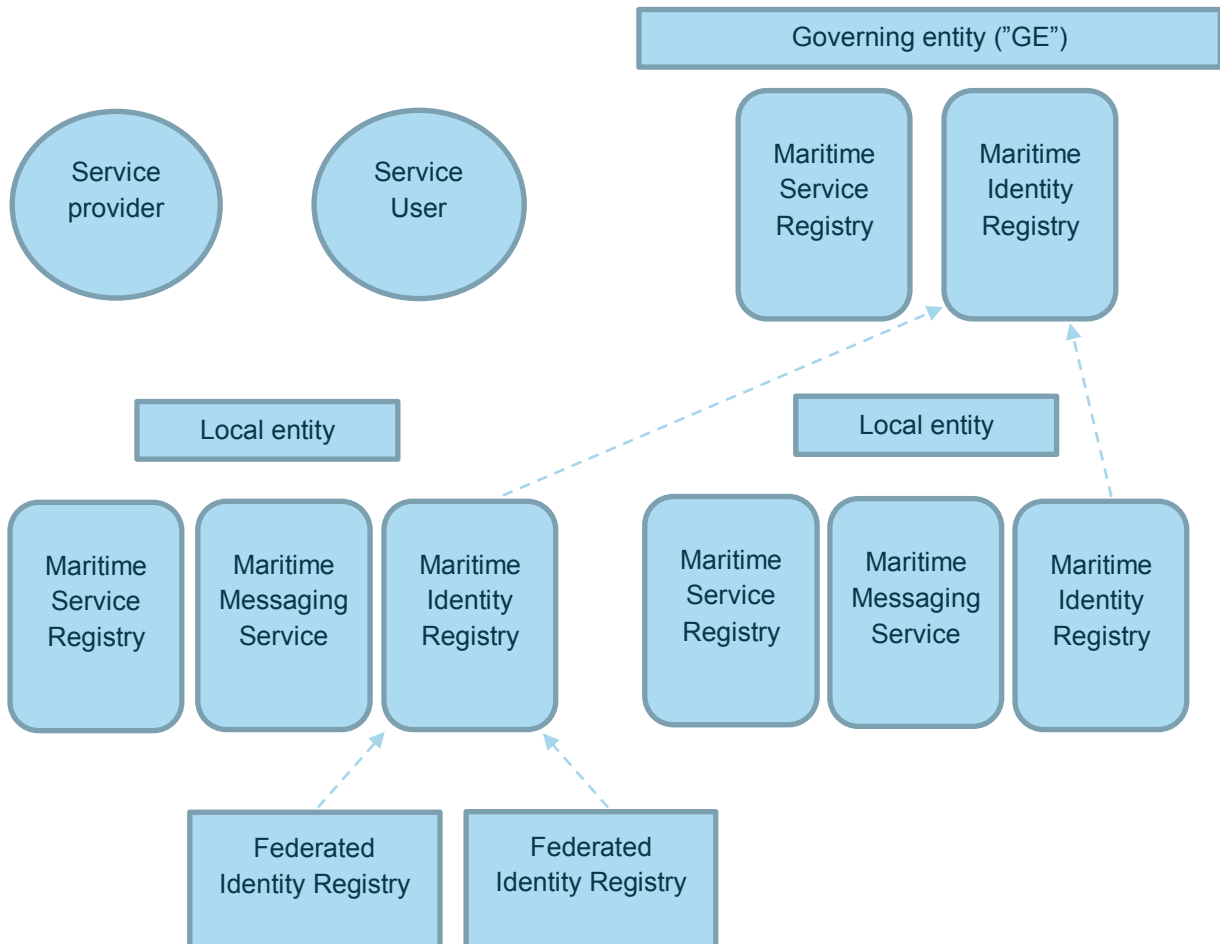
Ownership of the MCP

The nature of the governing entity (“GE”) depends on the chosen governance model.

The standards required to be maintained and provided for the global/top level of the MIR and MSR will rest with the GE (while the root certificate will fall under ITU).

Local entities acting e.g. on a national basis may develop and maintain instances of MIR and MSR, subject to the terms and requirements of the GE. Having this activity carried out at a national level is viewed as a requirement in order for some governments to adopt the MCP.

The GE, the local entities and the service providers (“SP”s) and/or service users (“SU”s) are illustrated below (a dashed line indicates federation of identity registries).



Depending on the governance structure and business model adopted for the MCP, legal relationships (rights, obligations, and/or potential liability) may exist between:

- the SUs/SPs and the GE.
- the SUs/SPs and the local entities.
- the SUs/SPs and the entities responsible for the federated identity registries.
- the GE, the local entities and/or the entities responsible for the federated identity registries.

The liability of the GE towards service providers, service consumers and third parties – for MIR and MSR

1 Contractual liability towards SPs and SUs

The use of the MIR and MSR will be available for all SPs and SUs, but the relevant SP/SU should be required to accept the GE’s terms of use (e.g. when the SP/SU registers in an MIR). These

terms will govern the GE's potential liability towards SPs and SUs. The GE's liability for the MIR and MSR should be excluded entirely where possible – except, perhaps, for liability for the authentication services under MIR, in order to promote trust in the MCP. The terms of use will need to be drafted.

To the extent that liability is accepted for MIR, suitable insurance would have to be taken out by the GE, or e.g. a mutual form of insurance for SPs and SUs could be established.

The terms of use should contain a choice of law clause, as this will ensure legal certainty with respect to liability, and thereby enable the MCP to function across jurisdictions without the risk of being subjected to unexpected liability. The terms of use and the choice of law clause would need to be stress-tested for validity under the laws of different jurisdictions.

2 Third party liability

A failure by the GE in relation to the MIR / MSR standards may cause disruption to an SU's commercial operation, which may in turn cause losses for third parties (e.g. non-users of the MCP). The general view is that the GE will not be subject to liability towards such third parties for loss/damage incurred in this regard – but this will need to be confirmed.

Liability for local entities developing and maintaining instances of MIR, MSR and MMS

1 Contractual liability towards SPs and SUs

To ensure that local entities operating MIR, MSR and/or MMS manage their activities in a safe, secure and efficient manner, a set of rules should be drafted containing the standards of the GE. The local entities would need to comply with these rules, and if they breach them, they may be excluded from the MCP. Where the local entity's breach results in a loss for an SP/SU, and if the SP/SU brings a claim against the GE, the rules should contain an obligation for the local entity to indemnify the GE against the claim.

If a business/governance model is adopted for the MCP whereby SPs and SUs contract directly with the local entities for the use of the MIR, MSR and/or MMS provided by the local entity, then suitable terms of use for local entities should be drafted.

Alternatively, (and this would seem to be the preferable option), it should be ensured that SPs and SUs contract with the GE, and only the GE, for the use of the MIR, MSR and MMS. No contract will be entered into between the local entity and the SP/SU, and therefore contractual liability for the local entities will not arise. If this option is used, the terms of use of the GE should be amended accordingly. The fact that some of the standards/functions/services are not provided by the GE, but by the local entities, does not change this.

As for federated identity registries with elements provided by external registries, the relevant external registry will be liable for authentication failures etc.

2 Third party liability

For third party liability, the same comments apply as for the GE above.

Liability for transmitted information, and logging of activities

Local entities providing MMS may potentially be subject to criminal liability for transmitted information. The liability can be mitigated by having the SPs and SUs provide indemnities (under the terms of use) for any liability (criminal or civil) arising due to the information transmission by the SPs/ SUs.

There is no immediately clear position with respect to logging of data and/or activity by the GE and/or the local entities for MIR, MSR and/or MMS. Such logging of activities may be required by relevant regulation, but it may also subject the relevant activity to data protection regulation. Further, it may be preferable from a commercial point of view in relation to payment by SPs and SUs. This point needs to be explored further.

Compliance with relevant regulation, including data protection regulation

The view is that the GE will not be involved in storage of sensitive data – if so, data protection regulation will not apply.

Local entities providing MIR functions and entities responsible for federated registries may be subject to data protection regulation, as they will be potentially be storing sensitive information. The same applies for local entities providing MMS functions. This point needs to be explored further.

There is a significant body of international regulation applicable to maritime matters, including safety and communication regulation. The compliance with such regulation will have to be explored further, including whether such regulation will apply to the GE and/or the local entities, or only to the SUs and SPs.

In discussion it was stated that the position regarding security certificates is unclear in view of the fact that the MCP does not store sensitive data. Location based contracts can be set up with agreed availability and performance metrics to verify system performance.

Discussion / Way Forward

In discussion it was suggested that a cascading system of governance similar to that proposed in ACCSEAS might be considered.

Considering the financial model, it is envisaged that customers will pay service providers for the service provided, service providers will pay an annual registration fee for access to the MCP. The cost of providing and running the MCP is not known at this time.

A joint approach with stakeholder organisations is envisaged for introduction of the MCP, taking account of, and respecting, organisations individual timelines.

A list of stakeholders is available on the EfficienSea2 web site.

There is a need for further development of documentation following the workshop, including the draft business case (E2MCPWS-7). It was agreed that this will be done by an editorial group after the workshop.

Although the EfficienSea2 project will terminate in April 2017, the MCP will continue to be developed through the STM and SMART-navigation projects.

Participants were advised that the draft Report of the workshop, without the outcome of WG3 and WG4 work was on the File share. The final report including conclusions will be provided on the File Share in one week.

Conclusions provided by the WGs contain some actions and separate lists of actions and conclusions will be distilled from those drafted by the WGs.

EfficienSea2 deliverable D1.6 will be revised in the light of the workshop and will include the business case.

Closing of the workshop

Nick Ward thanked the speakers, session and working group chairs for their excellent work. He thanked the participants for attending and contributing their time and expertise.

Bjorn Pedersen thanked Nick Ward for organising and chairing the workshop.

Nick Ward wished everyone a safe journey home and declared the workshop closed.

Acronyms

MIR Maritime Identity Register

MSR Maritime Service Register

MMS Maritime Message Service

ANNEX A WORKSHOP TECHNICAL PROGRAMME

Day 1 – Tuesday, 21 November 2017

Time	Activity	
0815 – 0900	Registration Registration is also available all day on Monday 20 November	
0900 - 0925	Session 1 - Opening of the Workshop	Chair: Nick Ward
0900 - 0910	Welcome from EfficienSea2 Co-ordinator	Bjorn Pedersen, DMA
0910 - 0920	Administration & Safety Briefing	Seamus Doyle, IALA
0920 - 0925	Workshop aims & objectives & structure	Nick Ward, IALA
0925 - 1045	Session 2 –Purpose, Structure, Core elements of MCP	Chair Thomas Christensen
0925 - 0940	Overview	Thomas Christensen, DMA
0940 - 0955	Identity registry and cyber security	Thomas Christensen, DMA
0955 - 1015	Service registry	Christoph Rihacek, FREQUENTIS
1015 - 1035	Messaging service	Jin Park, SMART-Navigation Project
1035 - 1045	Discussion	Thomas Christensen, DMA
1045 – 1115	Break	
1115 – 1300	Session 3 – Governance and Business Model Options	Chair: : Andy Winbow
1115 - 1135	Governance and Business models	Andy Winbow, CIRM
1135 - 1155	Other maritime information systems initiates worldwide	Ernie Batty, IMIS Global Ltd
1155 - 1215	Discussion of options for governance of the maritime connectivity platform	Andy Winbow, CIRM
1215 - 1230	Implementation plan – roadmap and action plan	Mikkel Hansen, Maritime Development Center
1230 - 1250	Focus group study with service providers, manufacturers and ship owners	Yemao Man, Chalmers University of Technology
1250 - 1300	Establishment of working groups	Nick Ward, IALA
1300 - 1400	Lunch	
1400 - 1530	Session 4 – Working Groups	Co-ordinator: Nick Ward
1400 - 1530	WG1 – Governance model Objective: Preferred option for governance model and timeline	Leader: Andy Winbow, CIRM
1400 - 1530	WG2 – Business Model Objective: Preferred option for business models with pros and cons. Exploitation plan with success criteria	Leader: Benjamin Weinert, OFFIS
1530 - 1600	Break	
1600 - 1800	Session 5 – Working Groups	Co-ordinator: Nick Ward
1615 - 1800	WG1 – Governance model Objective: Preferred option for governance model and timeline	Leader: Andy Winbow, CIRM
1615 - 1800	WG2 – Business Model Objective: Preferred option for business models with pros and cons. Exploitation plan with success criteria	Leader: Benjamin Weinert, OFFIS
1800 - 1930	Evening welcome social event Dress code casual.	

Day 2 – Wednesday, 22 November 2017

Time	Activity	
0900 -1015	Session 6 – Presentation of WG outputs	Co-ordinator: Nick Ward
0900 - 0930	Presentation of WG1 output	Leader: Andy Winbow, CIRM
0930 - 1000	Presentation of WG2 output	Leader: Benjamin Weinert, OFFIS
1000 - 1015	Discussion & establish working groups 3 & 4	Nick Ward
1015 - 1045	Break	
1045 -1240	Session 7 – Working Groups	Co-ordinator: Nick Ward
1045 – 1240	WG3 – Implementation plan Objective: Roadmap and action plan	Leader: Mikkel Hansen, Maritime Development Center
1045 – 1240	WG4 - Legal and Liability Objective: List of anticipated legal and liability issues. Possible solutions for legal and liability issues.	Leader: Christian Benedictsen-Nislev, Njord Law Firm
1240 - 1340	Lunch	
1340 - 1500	Session 8 – Presentation of WG outputs and closing	Co-ordinator: Nick Ward
1340 - 1410	Presentation of WG3 output	Leader: Mikkel Hansen, Maritime Development Center
1410 - 1440	Presentation of WG4 output	Leader: Christian Benedictsen-Nislev
1440 – 1450	Discussion / way forward	Nick Ward, IALA
1450 - 1500	Closing of the workshop	Nick Ward, IALA



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