BlueMassMed

BMM Thematic Report.

Users Operational Perspective

Date: 27 July 2012

INDEX

PART I. BMM USER´S PERSPECTIVE OF THE PROJECT

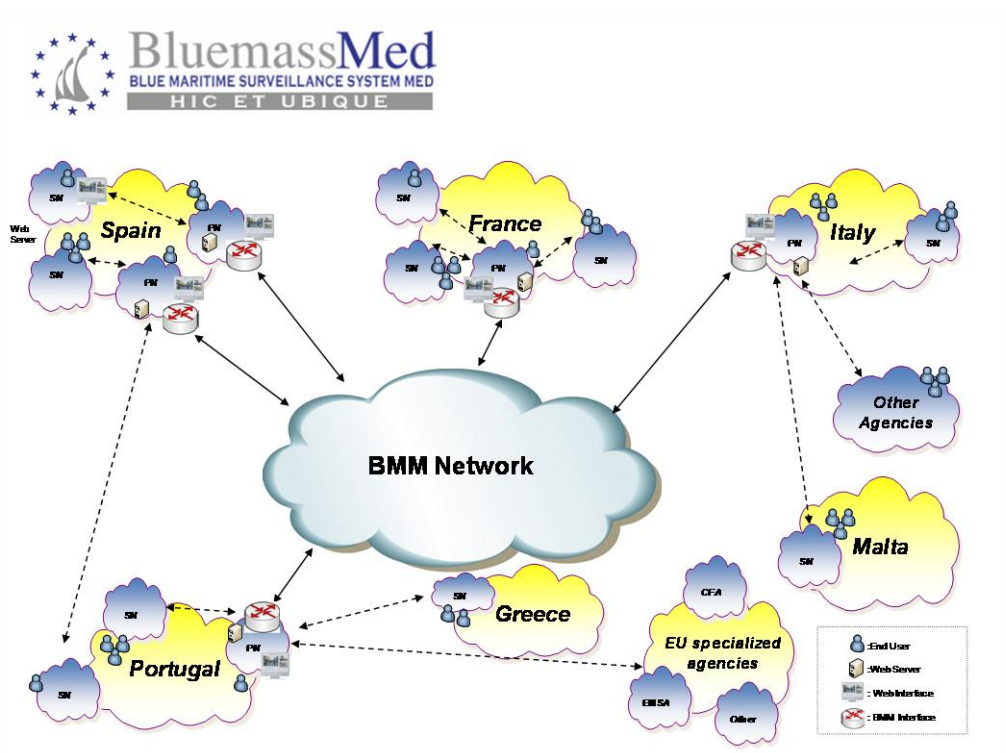
1. Introduction.

Blue Maritime Surveillance System for Mediterranean Sea (Blue MaSS Med) is a pilot project for the definition of the architecture of the future European wide Maritime Surveillance Network.

BMM goal is to propose a model through which the existing Maritime Surveillance Systems (MSS) of BMM partners and the other available commercial products (such as AIS, VMS, LRIT) contribute to build a **Shared Basic Common Maritime Picture (SBCMP)** and to expose BMM services, which will enhance the regional maritime situational awareness.

BMM project aims, as well, to develop methodologies and Standard Operating Procedures (SOP) shared by all the European Union Member States for the exploitation of the European Maritime Surveillance Network (EMSN), taking into account the dual use of EMSN (civil and military).

To help the definition of the EMSN, learning from experiment, the BMM Pilot Project Demonstration Phase will establish an Experimental Maritime Surveillance Network (XMSN) to connect existing monitoring and integrated tracking systems together through a federated architecture.



2. Background

Within each Member State of the European Union, a number of governmental agencies, each for its part of responsibility, collect and analyze information. Single-agency, single-state or combined interventions need sharing of information and intelligence between, and not only, the European Member States or their agencies. While exchange mechanisms of sectoral nature or, with a limited scope, already exist, a wide and commonly used mechanism has not yet been established to allow improvements on data exchange in quality and efficiency terms.

Such exchanges face some obstacle, on the one hand the lack of enthusiasm from some of the agencies to share information, and on the other hand technical, legal or administrative hurdles.

Blue Mass Med (BMM) is an European pilot project, launched by the European Commission (Directorate-General for Maritime Affairs and Fisheries - DG MARE), dedicated to the study of a future European capacity of a permanent surveillance of the Mediterranean maritime area and its Atlantic approaches.

It aims to prove the feasibility of a European capacity of a permanent surveillance of the Mediterranean maritime area and its Atlantic approaches by:

- determining the extent to which the project partners are potentially able to set up an exchange of information mechanism at a cross sectoral and cross border level that is viable and durable in time
- identifying the legal, administrative and technical obstacles that may hinder these exchanges
- studying the appropriate different kind of solutions (technical solutions ; best practices and/or legal adjustments ; etc) to overcome the obstacles identified
- illustrating the relevance of the proposals by realising an experimental exchange system between some of the existing national maritime surveillance systems; this exchange system will be implemented during a demonstration, which is part of the BMM project.

3. Scope

BMM pilot project aims the study of interoperability in maritime surveillance, between coastal European Union Member States of the Mediterranean Sea and its Atlantic approaches, and the implementation of a demonstrator.

The requirements for the interoperability solution encompass a node for each member state.

In order to conduct an adequate demonstration, those requirements have been streamlined appropriately, considering its purpose and the available time for this demonstration to occur.

Since each member state involved in the demonstration will develop its own node, the requirements specified have been adjusted and augmented to every context, as necessary, to support a proper and complete procurement process.

The project is managed by six EU Members States (Italy, Spain, Portugal, Greece, Malta, France), leaded by France. It gathers 37 governmental partners involved in state action at sea.
The project is based on a strong implication of the governmental partners.

4. Purpose

The objective is to define technical solutions able to demonstrate the possibility to control the exchange of information with some selected partners.

This project considers the major constraint concerning the systems which have to exchange information to each other related to sovereignty. BMM project expects a network oriented solution and doesn't allow a centralised system solution. So the technical solution is based on a distributed architecture, non intrusive for the systems of the partners recognizing that the nature itself of the maritime surveillance is devoted to both civil and military users (dual users).

BMM is divided in two phases:

- A study phase including experimental system's design and realisation phase
- A demonstration's phase

5. Concept

The BMM project is intended to demonstrate the willingness and the capability of 37 partners, involved in maritime surveillance in one way or the other and coming from six different European Union Member States in the Mediterranean Sea and its Atlantic approaches, to progress towards the integration of maritime surveillance both at a cross-sector and cross-border levels, by identifying potential obstacles and the appropriated solutions.

These partners have elaborated the "BMM network Operational Requirements" and the "BMM network Technical Requirements", to present a solution for the establishment of a European Wide integration of maritime surveillance. They intend to build up a BMM

Prototype Network, according to the criteria established in the Users Operational View and associated Technical Requirements, to show not only their resolve but also a feasible technical solution for the exchange of maritime surveillance information.

Based on the BMM Prototype Network, a "BMM demonstration phase" has been scheduled in the last phase of the project. During this phase, a shared basic common maritime picture (SBCMP) and other services are available to all partners taking part in the demo, either as primary nodes (those with Maritime surveillance Systems directly connected to BMM Network) or secondary nodes (connected to BMM network through a primary node).

This SBCMP integrates all the basic information (as defined in the User Requirements document) made available by the partners systems from all sources. The designed network architecture also enables the connection of future systems or systems already under development by the different EU agencies.

The experimental demonstration by the means of establishing and maintaining for a sufficient period of time a SBCMP is the attractor of the project that mobilizes all project actors by confronting them to concrete realisation of the output of their work. It demonstrates the added value offered to operational participants by running realistic scenarios like pollution incidents and customs issues.

The project is divided in two phases:

- a study's phase, experimental system's design and realisation phase, based on requirements' analysis and technical solutions' exploration and based on the best technical solutions among the applicable ones and including the realisation of the experimental system and the definition of the recommendations applicable to a future European Network dedicated to maritime surveillance
- a demonstration's phase, during which the industry involved in the project work, helps the contracting authority to run the experimental system implementing operational scenarios including a recompilation of lessons learned to be considered for next stages.

6. Architecture

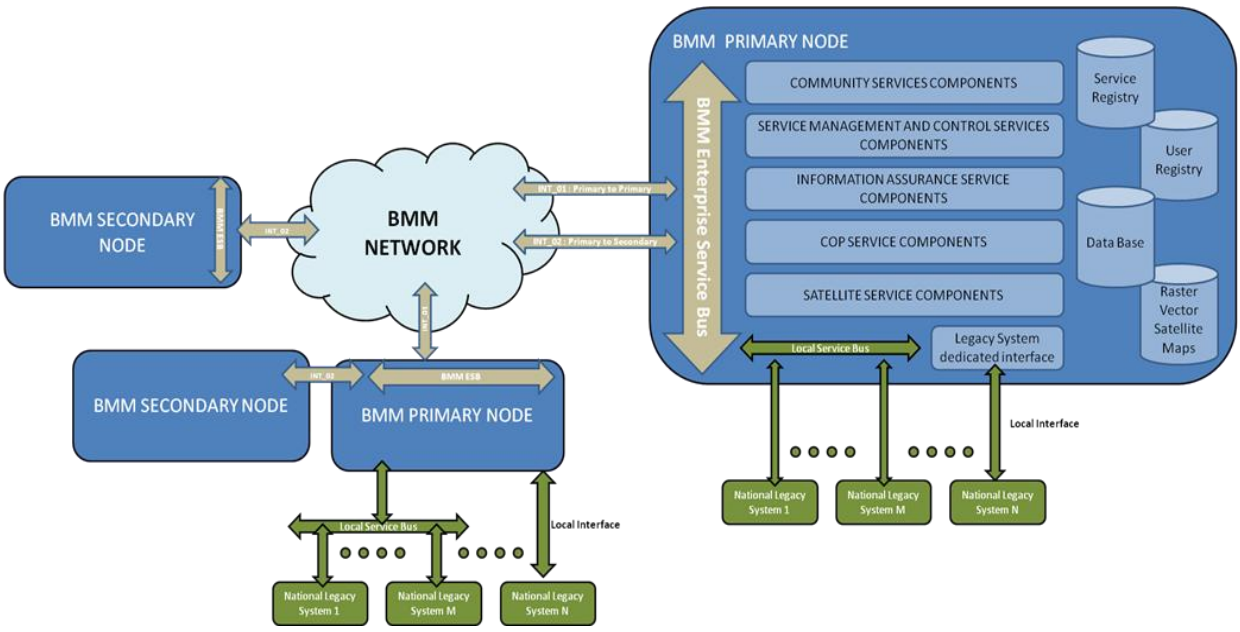
According to the specifications developed so far, the future EMSN architecture, resulting from the BMM project activities, shall include three main components:

- The Primary Nodes (PNs), i.e. the SOA-adapted National Systems participating in the BMM information sharing environment through the harmonised exchange of added value services and data, thus feeding the (virtual) Shared Basic Common Maritime Picture. As consideration, SBCMP is not a single real picture residing in one single centralised database but it is the picture resulting from all the tracks that the Primary Nodes have decided to exchange and it is distributed over all the Primary

Nodes tracks databases.

- The Secondary Nodes (SNs), i.e. the adapted National Systems participating in the BMM information sharing environment through a web-browser connection to the Primary Nodes web portals or National and European agencies willing to access the (virtual) Shared Basic Common Maritime Picture;
- The BMM Network, i.e. the communication architecture needed to establish a transport mechanism among the Primary and Secondary Nodes, supporting the platform independent exchange of core and common services across the nodes, basic information protection measures, and Quality of Service (QoS) requirements negotiation and enforcement.

BMM System View document reports the description of the main system components and functionalities applicable to the Primary and Secondary Nodes and to the Network, according to the NATO Architecture Framework (NAF) methodology followed so far in BMM.



BMM Operational Nodes

The Operational Nodes in Blue Mass Med are the agencies that are partners.

A BMM node is defined as an agency or partner which:

- produces information related to maritime surveillance and is able to make it available to other nodes by publishing it, so that the nodes that are interested in that information can subscribe.

- consumes information related to maritime surveillance published by other nodes.

Two types of BMM nodes are defined:

- **Primary Nodes**: a Member State node that implements the BMM common interface and can publish BMM services.
- **Secondary Nodes**: the adapted National Systems participating in the BMM information sharing environment through a web-browser connection to the Primary Nodes web portals or National and European agencies willing to access the (virtual) Shared Basic Common Maritime Picture through a web-browser connection.

BMM is Service Oriented, meaning that no pure data access or data repository is foreseen in the network. No global, remotely accessed situation database is created in the global EMSN architecture. The database will be a local data repository that will collect and store data and information, acquired by its own national legacy system or exchanged via BMM services.

BMM Primary nodes are virtual nodes that host a BMM Application Layer implementing BMM services available for other BMM nodes having the necessary privileges.

Nodes enable the maximum freedom to implement and grant added value services to the BMM community. BMM services can be implemented adapting native services of the existing legacy systems or adding additional service chains to comply with recognised Maritime Community service requirements.

At national level, BMM nodes will be interfaced, by Local Service Bus, gateways, adapters or dedicated peer-to-peer connections, to available National systems in order to exchange maritime data and information.

In an architectural perspective, the Primary Nodes will be seen as National Systems adapted so as to:

- feed the SBCMP implementing the BMM common and core services
- provide access to the SBCMP for the Secondary Nodes through dedicated web-portals

The BMM XMSN Demonstrator consists of the following Primary Nodes:

1. Italian Interagency Primary Node
2. French Interagency Primary Node
3. Spanish Navy Primary Node
4. Spanish Guardia Civil Primary Node
5. Portuguese Marinha & Guarda Nacional Republicana Primary Node

The BMM XMSN comprises the Secondary Nodes that are connected either to its national Primary Node through a Local Area Network or directly to other (foreign) Primary Nodes through the BMM Network.

BMM Network

The BMM Network has been designed to support flexible sharing, integration and exploitation of heterogeneous Maritime Surveillance Data by Competent Authorities.

The BMM Networking Architecture is an open, flexible network based on a net-centric and non centralized approach: no central controlling entity, but a distributed virtual BMM centre over each node.

The basic implementation choice for this kind of network is generally recognised to be the creation of a Wide Area Network (WAN) connection over the TCP/IP public network, with the proper information protection mechanisms to ensure a secure, transparent and guaranteed end-to-end transport layer among the network nodes.

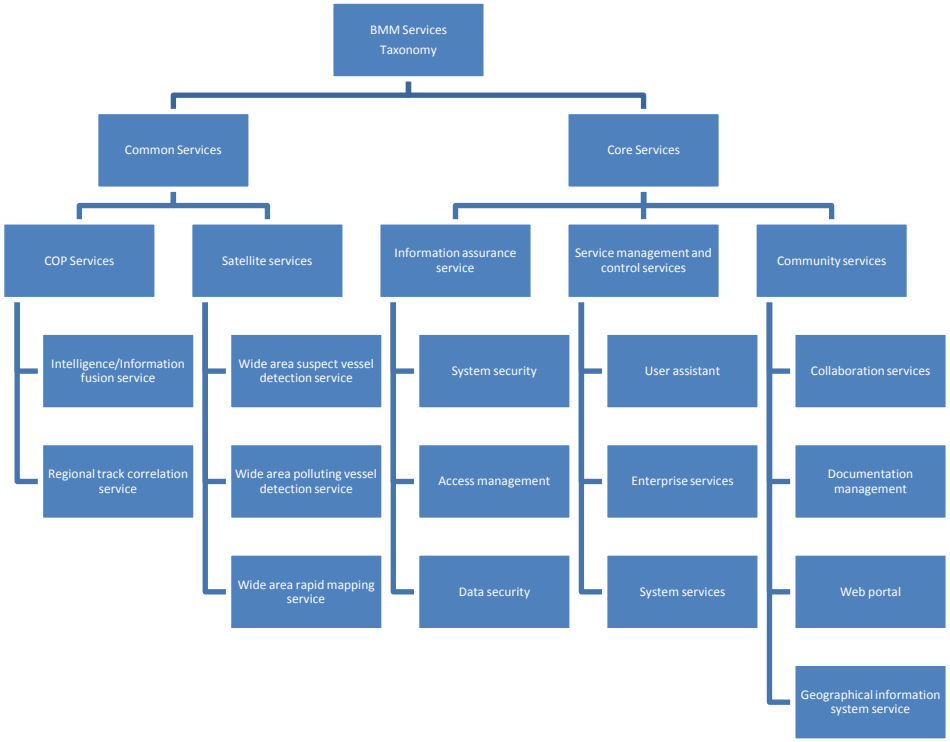
The BMM XMSN Network shall be a broadband TCP/IP network implemented through https/ssl protocol over the Public Internet.

Unclassified data (basic and non-basic as well as sensitive and non sensitive) will be exchanged using the XMSN.

7. Services

The BMM Network is based on a Service-Oriented-Architecture (SOA), assuring cooperative nodes to share information accessing services providing added value information for the enhancement of the Maritime Situational Awareness.

The following service taxonomy has been defined: BMM Common Operating Picture, BMM Satellite, BMM Information Assurance, BMM Service Management and Control, and BMM Community services.



BMM Common Services

BMM Common Services are the Operational Services enhancing the awareness and decision support capability of each connecting node and complying with the basic User requirements to provide a SBCMP and the other User requirements to provide added value functions.

The purpose of the common services is to provide a SBCMP and added value services for its exploitation, in order to understand the operational domain in terms of services supporting operational activities.

The following services are part of BMM Common Services:

- COP Services:
    - Intelligence / Information Fusion Service
    - Regional Track Correlation Service

- Satellite Services:
    - Wide Area Suspect Vessel Detection Service
    - Wide Area Polluting Vessel Detection Service
    - Wide Area Rapid Mapping Service

BMM Common Services Definition

Intelligence / Information Fusion service

The IIF service provides basic and/or detailed information associated to a given track, identified by its MMSI/IMO number to a requesting node; it provides capability to issue a similar request to another node; and continuous collection and association/integration of information on the local node to establish relationships between heterogeneous data, thanks to semantic detection services and semantic reasoning processes (abnormal behaviour detection, specific event detection, scenario detection, collective action detection).

Regional Track Correlation service

This service provides basic and/or detailed information associated to a given track, identified at least by its position and time to a requesting node. The association is based on kinematic data and if available on identity and voyage data and is providing an assessment of its performance, through a confidence level. Association techniques used will range from statistical correlation (when time difference is limited between local data and request information) to advanced reasoning processes. Moreover it provides basic and/or detailed track information associated to a given area, identified by its position and time window to a requesting node. The provided information is based upon the SBCMP manager; and the capability to issue similar requests to another node;

SBCMP management through the continuous collection and association/integration of information on the local node to establish and maintain the local COP, and then through data exchange with the other BMM nodes, establish and maintain the SBCMP. This activity will perform automated data correlation and association/integration through statistical-based and high level reasoning techniques. In addition, the activity will ensure the track management with the other BMM nodes, thus ensuring that no duplicate tracks exist in the SBCMP and identifying potential conflicts.

Wide Area Suspect Vessel Detection Service

Naval maritime traffic analysis by satellite is used to collect information on the position, dimensions of the ships detected and their direction and speed (where the wake is visible), on their time of passage through a given area and, by interpolating between successive observations, on the routes used to cross territorial waters.

Ships identification is possible only by incorporating the signals that must be by law transmitted by all sea-going vessels of a size exceeding a certain threshold or performing certain activities on the sea, as set in dedicated regulations. In case of illicit activities at sea, integrated ship detection service allows to identify and investigate on potential offenders.

During the BlueMassMed Demonstration, the Wide Area Suspect Vessel Detection Services exploit the integration of ship detection report obtained through the analysis of SAR (Synthetic Aperture Radar) satellite data and available identification systems datasets.

SAR satellites allow the detection of both cooperative and non-cooperative vessels, independently on the cloud coverage and the daytime.

Wide Area Polluting Vessel Detection Service

Satellite observations of marine oil slicks allow detecting oil spots position, dimensioning and running forecasting models for oil drifting to help authorities in recovery actions and estimate relevant risks and damages to the environment.

The state of the art of the operational satellite based oil spill detection techniques is entirely developed through the SAR (Synthetic Aperture RADAR) satellites data source. Thanks to the presently in orbit SAR satellites, it is possible to detect oil slicks of different dimensions and shapes.

Oil substances form visco-elastic films on the marine surface reducing the backscatter due to sea surface roughness generated by the wind. This phenomenon smoothes the sea gravity-capillary waves and can be detected by SAR satellites operating with microwaves, as the oil film appears as a dark spot on the image.

In order to monitor the sea waters in NRT (Near Real Time), which means in up to 30 minutes from the satellite pass, it is necessary to process satellite data acquired by a ground receiving station which coverage mask includes the area to be monitored.

This new generation SAR satellites allow a strong improvement in terms of revisit time and resolution, so that the current operational applications are performed on a periodical pre-defined data procurement plan.

Vessel detection associated to data analyzed for oil pollution detection supports the end-Users in potentially identify offenders. The same image is processed to detect vessels which are close to the oil spot at the satellite acquisition time. By integrating also identification data coming from the ground based systems (AIS, VMS, LRIT, etc, as made available by the competent authorities) it is also possible to backtrack vessels and compare their route with respect to the oil shape and location.

Wide Area Rapid Mapping Service

A rapid and effective access to satellite data is vital in order to ensure effectiveness to EO based information during an emergency, where timeliness is the first goal. Moreover, the capacity to adapt the delivery mechanism to a wide range of user's schemas enlarges the product usability. Finally, the rush access to both raster and vector reference databases are crucial when basic information is needed in a very short time frame.

The end-Users require the service through the BMM Service Requesting Node, indicating the area of interest, the kind of data to be acquired and the products needed in support to the competent authorities.

BMM Core Services

BMM Core Services are the System Services providing the core functions for the proper operation of the BMM network as well as the auxiliary functions for the connectivity, management, etc., and complying with the basic User requirements to provide a SBCMP and the additional User requirements to provide auxiliary connectivity functions.

The purpose of the core services is to provide essential services for assuring the correct operation of the BMM network and good connectivity and flexibility of cooperation among the connected nodes.

The following services are part of BMM Core Services:

- Information Assurance Services:
    - System Security
    - Access Management
    - Data Security
- Service Management and Control Services:
    - User Assistance
    - Enterprise Services
    - System Services
- Community Services :
    - Collaboration Services
    - Document Management
    - Web Portal
    - Geographic Information System Service

BMM Core Services Definition

Access Management

This service provides operations to manage a LDAP Directory Service for both Spanish Navy Primary Node Prototype Services and other BMM Primary Nodes user's management.

Enterprise Service (Service Registry Publish)

This service provides the capability to publish a webservice into the web service Registry UDDI for Spanish Navy Primary Node Services and other BMM Primary Nodes.

Operations:

1. Publish ⇨ This function allows the Services Administrator and other Primary Nodes to define applicable attributes to all the Primary Node Web Services: Business Entity, Business Service, Business Template and TModel following the UDDI v3 standard
2. Inquiry ⇨ This function allows to inquiry into the SPA UDDI Service Registry: Business Entity, Business Service, Business Template and TModel, following the UDDI v3 standard

Enterprise Service (Security Service Registry)

This service provides the capability of login into the Service Registry UDDI for Spanish Navy Primary Node Services and other BMM Primary Nodes.

Operation:

1. Security ⇨ This function allows to login into UDDI Registry

Web Portal

This service provides functionalities to allow BMM Users to access the (virtual) Shared Basic Common Maritime Picture using a web browser and to the collaborative tools.

Operations:

1. Presentation ⇨ Presentation of the Shared Basic Common Maritime Picture
2. Wiki ⇨ Tool provide by liferay
3. Forum ⇨ Tool provide by liferay
4. RSS ⇨ Tool provide by liferay
5. Web Mail ⇨ Tool provide by liferay
6. Chat ⇨ Openfire tool
7. Message Board ⇨ Tool provide by liferay
8. Manage documentation ⇨ Tool provide by liferay

Geographic Information System Service (WMS / WFS)

This service allows other BMM Primary Nodes to access to the WMS service.

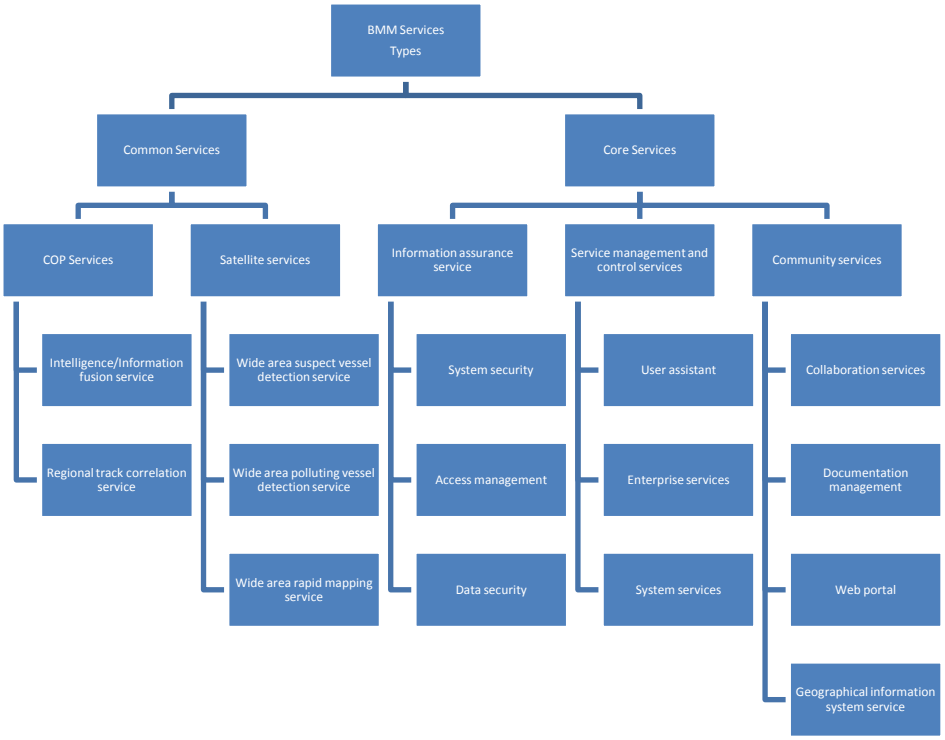
Operations:

1. WMS Repository ⇨ Following standard WMS
2. WFS Repository ⇨ Following WFS standard

BMM Services Demonstration

The following shows the minimum set of services that all the Primary Nodes need to make available:

- COP Services:
  - Intelligence / Information Fusion Service
  - Regional Track Correlation Service
- Satellite Services:
  - Wide Area Rapid Mapping Service
- Information Assurance Services:
  - Access Management
- Service Management and Control Services :
  - Enterprise Services
- Community Services :
  - Web Portal
  - Geographic Information System Service



8. SCMBP

A Shared Common Maritime Basic Picture (SCMBP) is a single identical display of relevant maritime information shared by the nodes involved in BMM. A SCMBP facilitates collaborative planning and assists all echelons to achieve situational awareness.

SCMBP is part of the Web Portal developed by the nodes to provide BMM users a secure and user-friendly Web Based front-end application, which enables them dynamically and interactively access to wide range information and application services provided within BMM Network.

The Geographic Information System (GIS) Service provides support for accessing and exploiting digital geographic information, within BMM Network, in terms of GIS Application (including the use of web technologies), geo-database, and geo-catalogue.

SBCMP Building Principles

The following principles are based on the development of a common picture, where track's information is managed by all nodes according to the same rules:

1. Tracks received by a PN from its back-end are elaborated according to PN specific rules and "promoted" to the SBCMP through the assignment of an unique identifier (for example IT_0001, PT_0001, SPA_0001, SPG_0001, etc.)

2. Own Tracks (tracks with identifier NN=Own PN) are continuously exchanged with the other PNs through the defined service GetAreaInfo()

3. Tracks received from other Primary Nodes are processed at regular intervals, variables according to the operational needs (e.g. from 1 to 6 min) by each PN in order to establish the potential association/ correlation with own tracks and solve conflicts in areas of overlapping

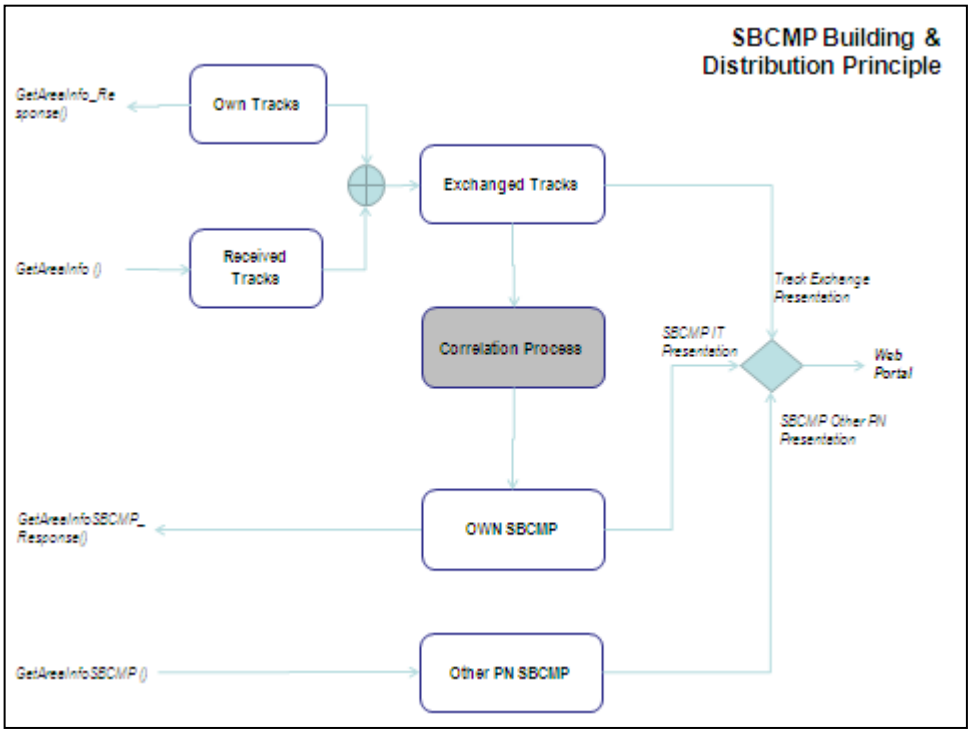
4. On all the received tracks for which an association or a correlation is found:
   - the SBCMP identifier of the new track is replaced by the SBCMP identifier of the associated existing track
   - the traceability to the owner of the track data is however maintained
   - all Ship Id and other information fields of the associated tracks are aligned
   - a correlation confidence index is assigned to the new track and/or to the existing track, whichever is not already 100% identified by Ship Id data.
   - the position information of the associated tracks could also be aligned through a harmonized ranking algorithm (this point could be an optional)

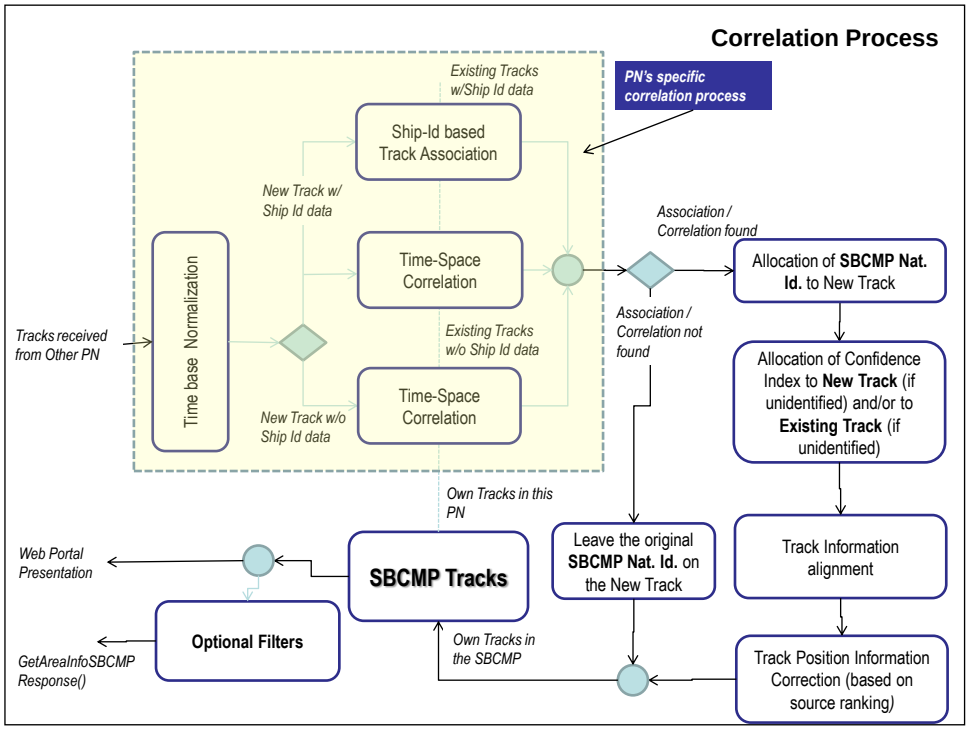
5. All the received tracks for which no association or correlation is found, are kept with the original SBCMP identifier and are not modified

6. All SBCMP tracks (own and received) are exchanged (after the correlation process) with other Nodes through a dedicated method GetAreaInfo_SBCMP()

7. Specific flags or service methods could be implemented to enable/disable the exchange of SBCMP tracks coming from EU-wide sectorial systems, etc.

8. All SBCMP tracks are presented on the web portal for use by secondary nodes.

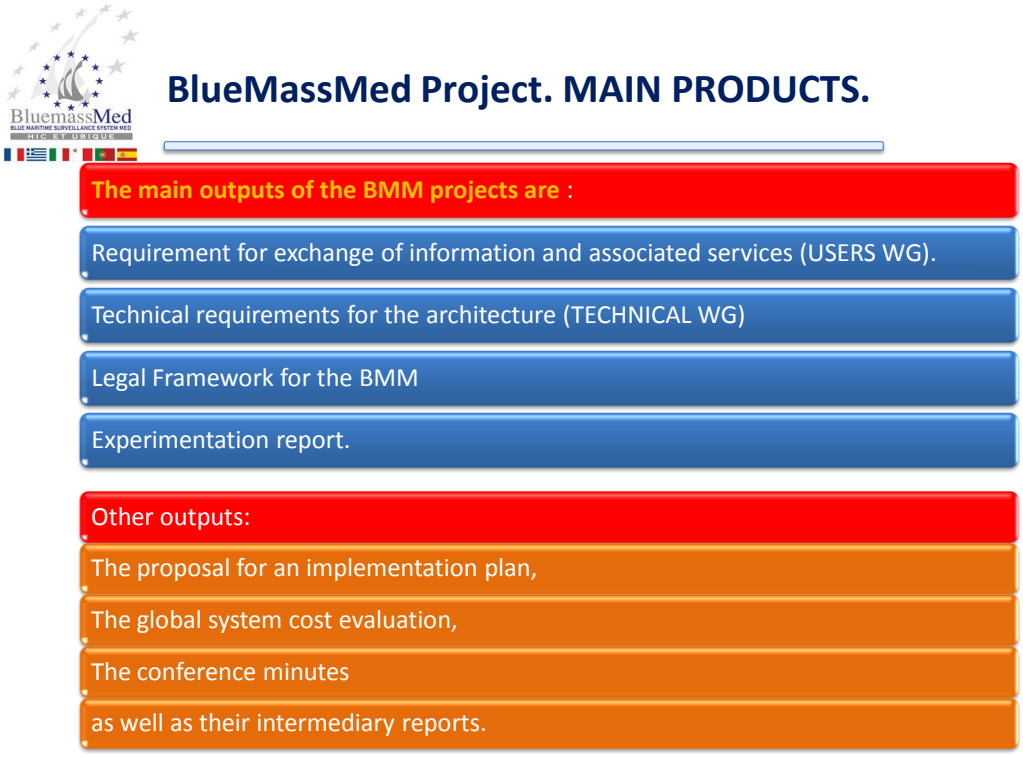



Correlation Process
Existing Tracks w/Ship Id data
PN's specific correlation process
Ship-Id based Track Association
New Track w/ Ship Id data
Association / Correlation found
Allocation of SBCMP Nat. Id. to New Track
Time-Space Correlation
Tracks received from Other PN
Time base Normalization
Existing Tracks w/o Ship Id data
Association / Correlation not found
Allocation of Confidence Index to New Track (if unidentified) and/or to Existing Track (if unidentified)
New Track w/o Ship Id data
Time-Space Correlation
Own Tracks in this PN
Web Portal Presentation
SBCMP Tracks
Leave the original SBCMP Nat. Id. on the New Track
Track Information alignment
Optional Filters
GetAreaInfoSBCMP Response()
Own Tracks in the SBCMP
Track Position Information Correction (based on source ranking)

PART II. UWG WORKING PLAN AND RESULTS

1. The initial working Plan

Based on the Grand Agreement the project expected main outputs were the following:



The work of the Users Working Group has been focused to perform the following task, and in order to produce at least the following associated products:

1. Definition of information exchange requirements for the establishment of a SBCMP. The main product will be a "Data Exchange and Dissemination Requirements Document".

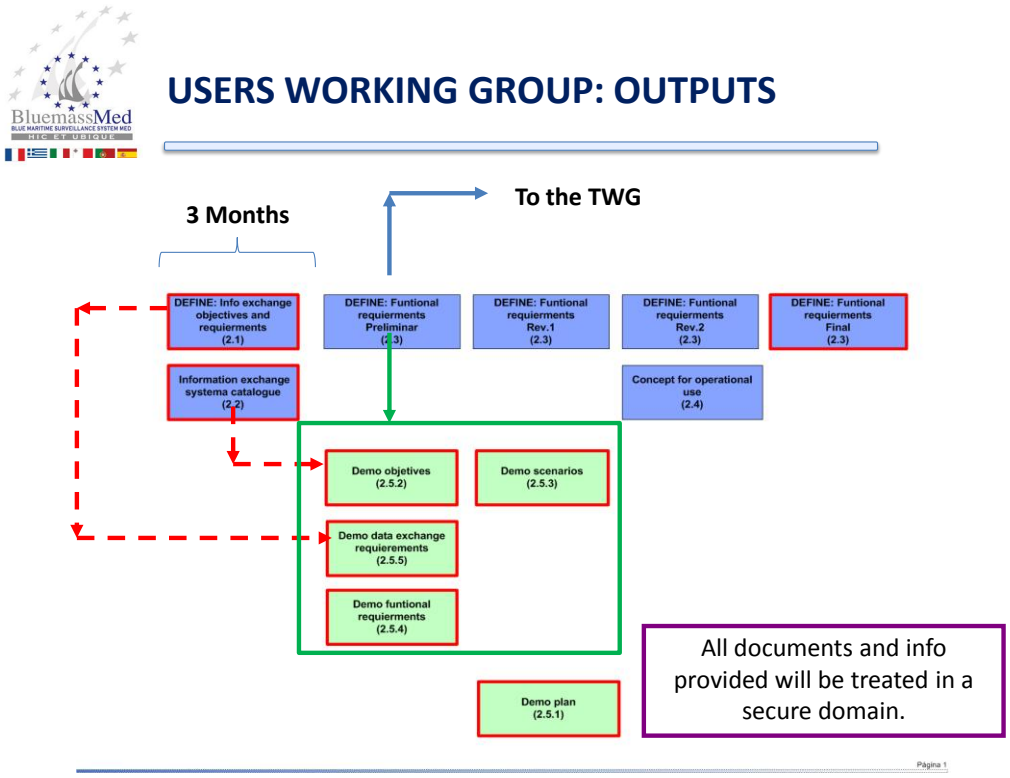
2. Study of the current maritime Surveillance Systems. The main product will be an "Information Exchange Systems Catalogue".

3. **Definition of the Functional Requirements. The main product will be a "SBCMP Functional Requirements Document".**

4. Definition of information exchange best practices, rules and procedures for the establishments of a SBCMP. The product will be a “Concept for operational use of the SBCMP”.

5. Definition of the Data Exchange Demonstrator. The products will be: “Demonstration objectives document”, “Demonstration scenarios document”, “Data exchange requirements for experimental system”, “Functional requirements for experimental system”.

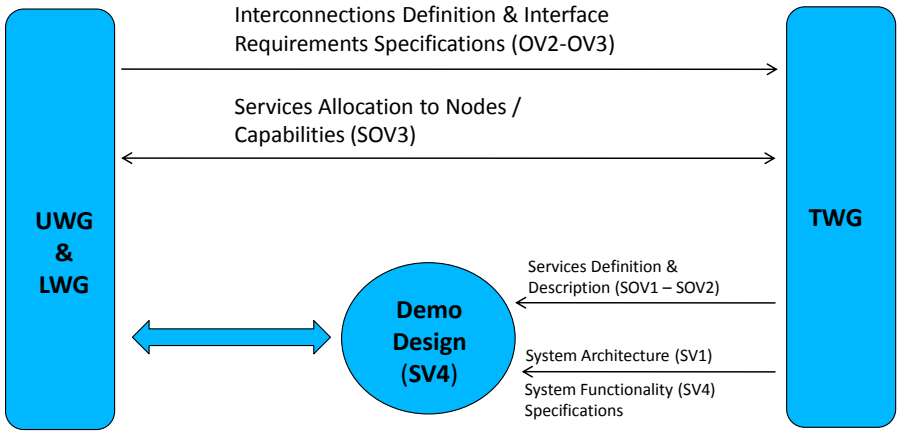
To achieve the above purposes the “Plan of Work” set up by the UWG was:



The user´s requirement document was the first document of the BMM Project and the one that has directed the rest of the Project. A close relationship between the UWG and TWG has been the key for getting a comprehensive user´s requirements. In the picture bellow the relation between the TWG and the UWG throughout the project is shown:

USERS – TECHNICAL WG´S SYNCHRONIZATION

Proposed Methodology for TWG



2. Methodology

The first step was the establishment of a methodology to develop the User Requirement document and focused to fix what type of Data and in which circumstances these Data are going to be exchanged. This was based in four main steps:

- Step 1. Elicitation.
  - RFI 001: Questionnaires drafting.
  - RFI 002: Partners Inputs.
- Step 2. Analysis and specification.
  - Document Drafting.
- Step 3. Validation.
- Step 4. Negotiation.

In the Elicitation Partners were asked to define what kind of data they were willing to share and which one they would like to receive. Then the next steps were accomplished.

Before entering to work in the document the following basic principles were agreed by the partners:

- Partners are willing to exchange data.
- Data already available.
- Partners need to set up "Basic data set".
- Partners should be able to share "Additional specific data" with some specific agencies.
- Partners are able to decide when to share or not to share (time, space, subject, etc.
- Partners need to leave the door open for future developments in data sharing.
- "Basic Shared Common Recognized Maritime Picture" (BMM Description), as a "repository" where all partners could find useful maritime information for the elaboration of their own user oriented Maritime Situational Awareness.
- Bottom up approach. From simple to complex.
- No hierarchical relationship, all partners are equals/No single authority/Internet "like" approach, no aprioristic need of intermediate steps.
- Concept for operational use, based on the integration achieved.
- Honest share of information among partners, non attribution of responsibilities based on shared information.

These agreed principles were vital all along the Project as many agencies were at the beginning reluctant to exchange information.

A close coordination from the very beginning between the UWG and TWG is vital

The detailed definition of the User Requirements needs a dedicated small group inside the UWG and some technical experts to support

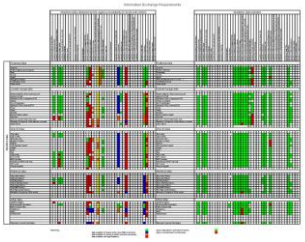
Ones the principles were agreed the following "Plan Work" was again adapted at the current situation:

THE UWG PLAN OF WORK

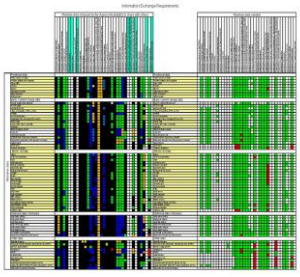
- Data exchange and dissemination requirements Matrix
- User Requirements document
- Definition of the Data Exchange Demonstrator
- Concept for operational use
- Evaluation report

Based on the Elicitation process the UWG had two main outcomes; the data package and the data exchange matrix that are attached as Annex 1 and 2, and are shown below:

THE EVOLUTION



IM2 UWG Lisboa meeting.



IM3 UWG Madrid meeting.

UWG main Agreements:

- Partners are willing to exchange data .
- Most of the Maritime Data already available.
- Partners need to set up a "Basic data set".
- Partners are willing to share "Additional specific data" with some specific agencies.
- Partners should be able to decide when to share or not to share (time, space, subject, etc.
- The BMM project need to leave the door open for future developments in data sharing.

OPERATIONAL INFORMATION REQUIREMENTS
BASIC DATA SET I

Positional data

- Track number or label
- Position latitude and longitude
- Time GMT
- Course
- Speed
- Navigational status
- Type of sensor
- Data provider

Basic Current voyage data

- Port of origin
- Last port of Call
- Time of Departure (ETD + ATD)
- Port of destination
- Estimated Time of arrival (ETA +ATA)
- Route Plan
- Cargo(IMO class+ quantity)
- Draught
- Total number of persons onboard
- ISPS level
- Platform limitations

OPERATIONAL INFORMATION REQUIREMENTS
BASIC DATA SET II

BASIC ID Data

- Name
- Year of construction
- Type
- Hull main color
- Number of masts
- propulsion type
- Ship maximum speed
- Length
- Beam
- Max draught
- Gross tonage
- Dead weight
- Port of registry
- Flag
- Ship owner
- Ship company
- IMO number
- MMSI number
- International Radio Call Sign
- classification society
- Ship photograph

Other data

- Satellite Imagery
- Environmental information (detail what info) (SERV)
- METOC data (SERV)
- Insurrance coy
- Ship agent
- Environmental INCIDENT (BASIC DATA)
- safety INCIDENT REPORT

At this point it was decided not to use at the demonstration real sensible or classified exchange of information. Basically this decision was based on the difficulties to achieve an agreement with all the partners on the way to deal and store this classified information as well as the crypto material to be used. In this line the sensible or classify information to be exchange during the demonstration phase would be fake.

As a results the exchange of sensible or classify information has not been tested in this Project.

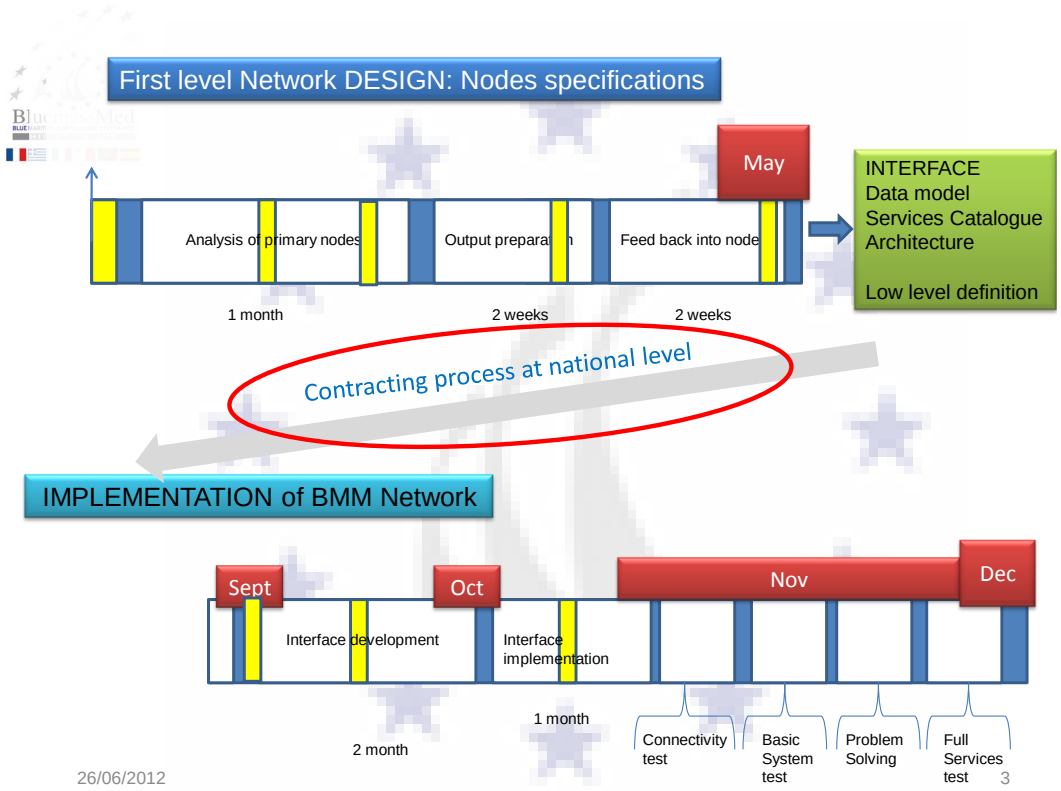
Based on all the factors and conditions described above the UWG did an important effort to issue in three month time the first version of the User´s requirements. As soon it was ready this document was transfer to the TWG to start their main work. The User´s Requirements Document is attached as annex 1, and is basic structure is shown in the next picture.

THE FIRST OUTPUT: USER REQUIREMENTS DOCUMENT…

- Introduction
- BMM Architecture
  - Operational Nodes List.
  - Information Exchange Concepts.
- Operational (Users) View
  - High-Level Operational Concept Description (OV-1)
  - Operational Node Connectivity Description (OV-2)
  - Operational Information Requirements (OV-3)
  - Data exchange requirements (DER)

3. The implementation Plan

As the Project progresses the UWG started to focus on the demonstration. However, as the pave of the Project started to slowdown and the way to progress was unclear, the UWGL in coordination with the TWGL prepared a way ahead for the Project. On July 2011, during the UWG in Palma de Mallorca (Spain), the following roadmap was proposed to continue with the Project:



This proposal was agreed and taken as “working Plan”, and of course, most of this work needed to be done by the TWG. As the user´s requirements were already defined the UWG focused its efforts on developing the scenarios for the demonstration. The scenarios developed are attached as Annex III.

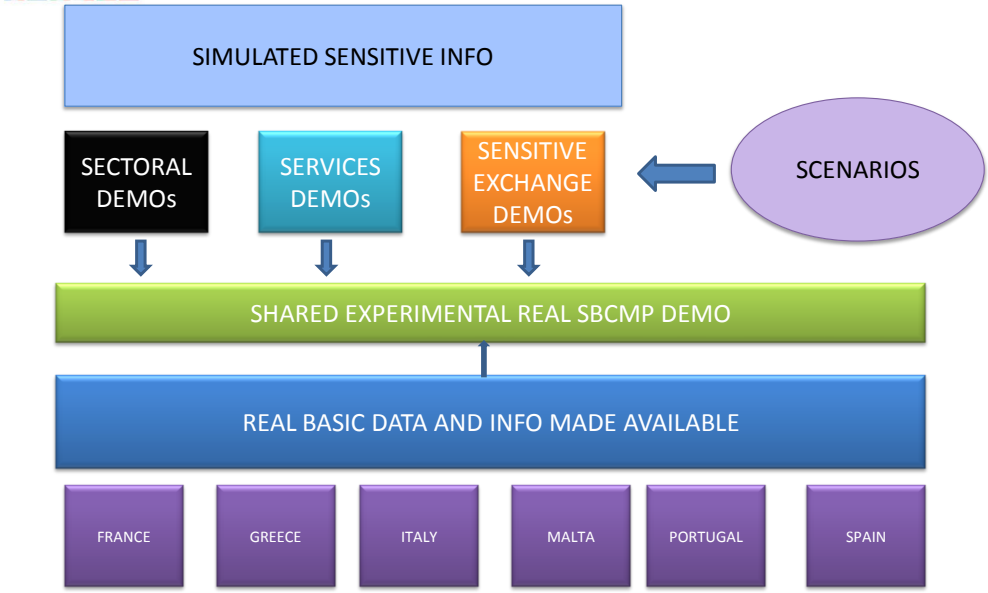
4. The Demonstration Scheme

The scheme of the demonstrations was set up, and its details are described in the pictures bellow.

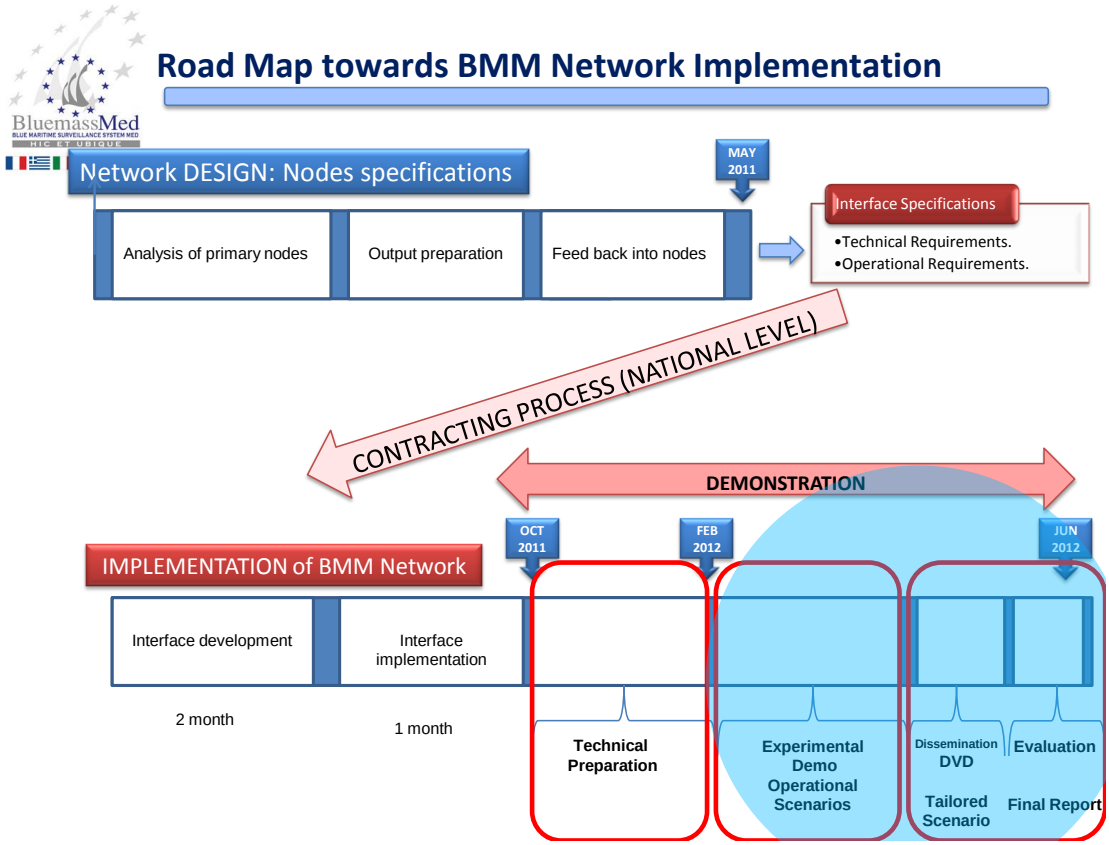
DEMONSTRATION OBJECTIVE

- Establishing and maintaining for a sufficient period of time a SBCMP
- Added value for participants by running realistic scenarios
- Culmination in the process of identifying obstacles

DEMO SCHEME



As the Project progresses the Roadmap to the demonstration was updated several times to update the phases due to the difficulties in sorting out the technical aspects, interoperability flaws, etc...



It was also necessary to implement the network by steps, in order to be able to understand the main failures, identified then and correct before starting the next step. In this way an IOC, MOC and FOC were scheduled. The conditions to be reached in each step are shown in the following pictures.

SCHEDULE OF IMPLEMENTATION

02 April 2012 (Ending web service development)

- CorrelationService Server (algorithm) & Client (Web Portal). Basic version
- WideAreaMapping Server & Client (Web Portal)

16 April 2012 (IOC)

- Web Portal capabilities based on topics in order to improve scenarios

30 April 2012 (MOC)

- Install/Federate other collaborative tools

21 May 2012 (FOC)

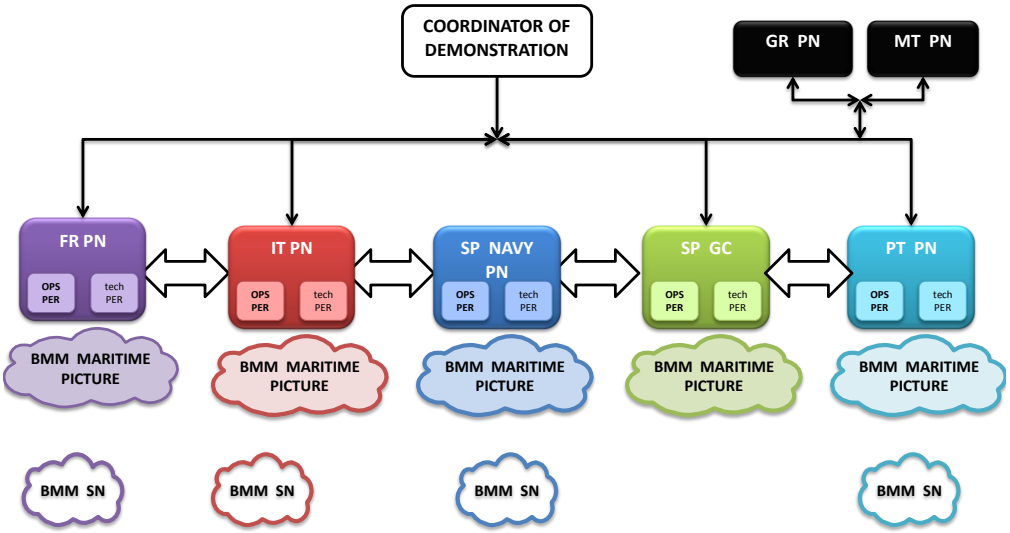
- Improve advanced skill of Web Portal

Between 21 May and 07 June 2012

- Access management. (Web Service user authorization)
- Improve fusion algorithm and enhancement of the SBCMP

For de demonstration it was recommended by the UWG to establish a Coordination structure. This structure, depicted in the picture below, was led by the Demo Coordinator (contracted by BMM for this purposes) and basically had the main responsible in each primary and secondary node.

ORGANIZATIONAL STRUCTURE FOR DEMONSTRATION



Census of the nodes

BMM Network connected Nodes						Dependant Secondary Node
MS	Partner	Location	Internet access		Primary (P) or Secondary (S)	Partner
FR	Defence (Navy)	Toulon	adsl	2 Mbit/s ?	P	
	Defence	Brest	adsl	Tbd	S	
	Inter-ministerial	Paris	adsl	Tbd	S	
	Customs	Paris	adsl	Tbd	S	
	Customs	Marseille	adsl	Tbd	S	
	Interior	Rennes	adsl	Tbd	S	
	Maritime Affairs	La Garde	adsl	Tbd	S	
GR	Coast Guard	Piraeus	adsl	Tbd	S	
IT	Inter-ministerial	Roma	adsl	Tbd	P	Immigration Drug Finance Customs Defence Transport Coast Guard Environment Agriculture
MT	Defence	Valetta	adsl	Tbd	S	
SP	Defence	Cartagena	adsl	Tbd	P	SASEMAR DAVA SEGEMAR
	Interior	Madrid	adsl	Tbd	P	
PT	Defence	Lisboa	adsl	Tbd	P (double)	IPTM (Instituto Portuário e dos Transportes Marítimos) FAP (Força Aérea Portuguesa) SEF (Serviço de Estrangeiros e Fronteiras) DGAEIC (Direcção Geral das Alfândegas e dos Impostos Especiais sobre o Consumo) ASAE (Autoridade de Segurança Alimentar e Económica) PJ (Polícia Judiciária) SSI (Sistema de Segurança Interna)
	Interior (GNR)	Lisboa	adsl	Tbd		EMAM (Estrutura de Missão para os Assuntos do Mar)
EU	DG MARE	Brussel	adsl	Tbd	S	
	FRONTEX	Varsaw	adsl	Tbd	S	
	JRC	?	adsl	Tbd	S	
10 secondary nodes directly connected to BMM Network						
17 secondary nodes connected to one Primary Node						

As mentioned before, to support the Demonstration six scenarios were developed (see annex 3) . Initially these six scenarios would provide situations to test all the user´s requirements and services. In addition to that they were designed to provide the opportunity to all partners to take a place in the demonstration and to ensure that all sectors were represented. The scenarios initially develop inside the UWG but finally, and as requested by some partners, the responsibility to develop them was spread among the countries with a primary node.

As the time was pressing against the VIP Demo as well as the end of the Project, practically only one Scenario was fully developed to support the Experimental Demonstration. However, this scenario was a mix of three of the previous developed ones and took into account the principle to involved all sectors represented in BMM.

The development of the scenarios should remain in the UWG.

Six scenarios were too many and difficult to develop in detail.

The final schedule for the Demonstration was set up two months before the last event of the Demonstration and is shown below:

SCHEDULE OF DEMONSTRATION

21 May-25 May (Final Operational Capability) (Run only VIP Vignette)

- Run VIP Vignette for training and VIP day preparation
- Other Vignettes as required for specific Lessons Learnt purposes
- Improve advanced skill of Web Portal

Between 21 May and 07 June 2012 (Preparation for VIP Demo)

- Focus on VIP day
- Access management. (Web Service user authorization)
- Improve fusion algorithm and enhancement of the SBCMP

PART III. CONCLUSIONS AND RECOMMENDATIONS.

1. Conclusions.

The Operational Partners involved in BMM belong to different national authorities responsible for different functions of the state at sea (border control, maritime safety and security, fishery control, customs, maritime environment, general law enforcement and defence). These operational partners were used and familiar to collect and analyze maritime information for their own purposes, however they were not familiar with the process of sharing that information in a meaningful manner, and more importantly to see the operational benefits of having a enhance common maritime situational awareness by sharing maritime information.

During the work of the UWG, an through the development of the Operational View, the Exchange Information Matrix, the Scenarios and the Experimental Demonstration, the awareness of operational partners of the benefits of having a SBCMP by sharing maritime information both at cross-sector and cross-border level was improved.

The Operational Partners also assessed that BMM is only the first step, and the future system requires the establishment of operational standard processes and procedures to enable effective information sharing and the protection of information shared on the basis of agreed access rights. This should also lead to improved interoperability between sectoral systems within Member States.

The Operational Partners also assessed the positive impact of BMM in order to increase the efficiency of surveillance systems. During the running of the scenarios BMM showed its potential in order to facilitate the unity of surveillance effort (including assets) across different authorities to cope with a dangerous situation at sea.

The decentralized architecture of the system allowed full ownership of the process of sharing information to Operational Partners and thus respecting the subsidiarity principle. The vast majority of monitoring and surveillance activities at sea are carried out under the responsibility of Member States and BMM allowed full ownership of the process of sharing information.

Finally, it was assessed that BMM has the potential to provide comprehensive information for better decision making by interfacing different communities. In this regard the BMM was able to facilitate the two – directional exchange of information between civilian and military authorities.

2. Recomendations.

Base on the work of the BMM UWG continue with the development of operational standard processes and procedures to enable effective information sharing cross border and cross sector and the protection of information shared on the basis of agreed access rights.

Continue the decentralized approach towards the CISE.