

**Annex A of the Tender Specifications attached to the
Invitation to tender N° EMSA/NEG/43/2015 for further
development of EMSA's mobile applications for Integrated
Maritime Services**

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1 Introduction

1.1 Background

The European Maritime Safety Agency (EMSA) was established under Regulation 1406/2002/EC of the European Parliament and of the Council to contribute to the enhancement of European maritime safety.

Among its tasks, the Agency should progress on the Integrated Maritime Data Environment (IMDatE), data integration (the exchange of data between information systems) and data fusion (combining data from different sources). Mobile applications can play a significant role in terms of allowing new usage opportunities of the EMSA maritime applications as well as expanding user adoption of existing systems.

1.2 Work breakdown

In this respect it is anticipated that the project plan shall include the following work-packages as per the table below. The offer should detail further the specific activities to be executed under each work-package and the milestone events associated with the activities.

Ref	Work package name	Work package description
WP1	Further developments of IMS application for multiple platforms	Further developments of the IMS mobile applications, including three sub-work packages: <ul style="list-style-type: none">WP1.1: iOS (iPad – screen size up to 10’')WP1.2: iOS (iPhone – screen size up 5’')WP1.3: Android (Tablet – screen size up to 10.5’')
WP2	Further developments of the IMS web services	Further developments of IMS web services and cloud catalogue and storage services including the two following sub-work packages: <ul style="list-style-type: none">WP2.1 Additional functionalities related with the OSB server side business logic componentWP2.2 Additional functionalities linked with the cloud catalogue and cloud storage components
WP3	Convergence with EMSA’s SafeSeaNet Ecosystem new developments	EMSA’s SafeSeaNet Ecosystem includes two main projects with which the IMS mobile application and IMS web services need to converge: <ul style="list-style-type: none">Single Graphic interface (SEG) will be the future interface for EMSA maritime applications. In the scope of WP3 the contractor is expected to align the mobile apps (in terms of the main design elements) with the SEG.Earth Observation Data Centre (EODC) will be the reference in terms of storing and processing geospatial information at EMSA. In WP3 the contractor will have to adapt the IMS web services to interact with this new system.
WP4	Maintenance	One year of maintenance and support for the developed solutions.

1.3 Global requirements

Ref: IMS_GEN_01	Nature: Mandatory
General requirement	
If the bidder has to deviate from the requirements set out in this document, then the bidder must present equivalent requirements and must justify the deviation(s). EMSA reserves the right to disagree with the deviation and the proposed solution.	
Ref: IMS_GEN_02	Nature: Mandatory
General requirement	
References in this document like “Chapter”, “Section” or “Paragraph” are referring to this document unless other reference documents are identified explicitly.	
Ref: IMS_GEN_03	Nature: Mandatory
General requirement	
<u>The requirements for further developments included in WP1 and WP3 are valid for all applications (iOS phone, iOS tablet and Android Tablet) except if stated otherwise.</u>	
Ref: IMS_GEN_04	Nature: Mandatory
General requirement	
When a requirement mentions “the Contractor” it is referring to the company or consortium to which the contract will be awarded.	
When a requirement mentions “the bidder” it is referring to the company producing a bid for this tender offer.	

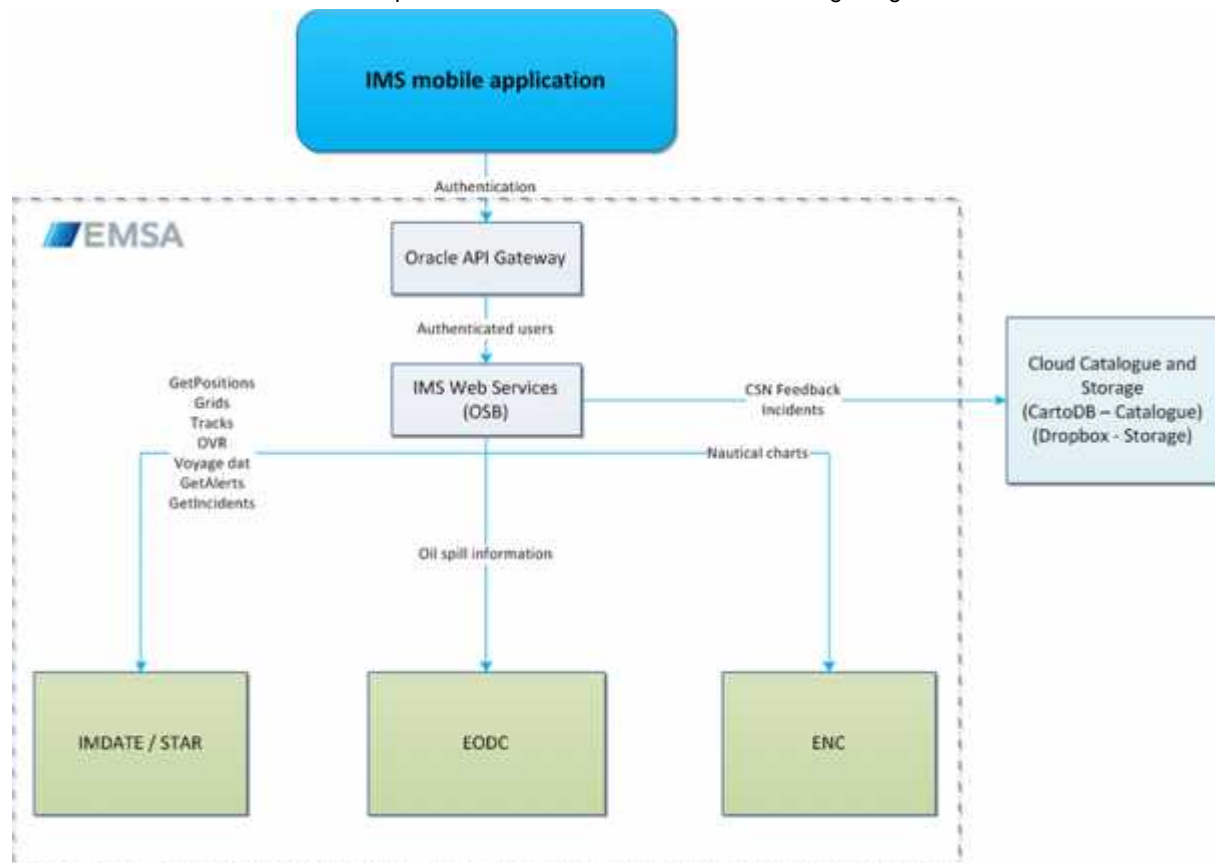
1.4 General information

Ref: IMS_INFO_01	Nature: Informative
General description	
<p>The first IMS app project deployed an operational mobile solution to EMSA users of integrated services. This included:</p> <ul style="list-style-type: none"> ▪ Development of iOS and Android application to address a set of use cases, including: <ul style="list-style-type: none"> ○ Vessel position & detail information ○ Area centric query ○ Incident reporting ○ Oil spill monitoring and feedback ▪ Development of the IMS web services on top of EMSA's Oracle Service Bus that connect to all other web-services needed by the mobile application ▪ Integration with the EMSA's single sign on via Oracle API Gateway 	
Ref: IMS_INFO_02	Nature: Informative
Cloud catalogue and configuration	
<p>CartoDB is currently used as catalogue service to inventory all the multimedia contents metadata. This is a standard catalogue service that provides standard interfaces as Open Geospatial Consortium Catalogue Services (OGC-CSW) and compliant with INSPIRE discovery service. Additionally CartoDB is used for:</p> <ul style="list-style-type: none"> - Storing meta-information about uploaded content - Storing menu preferences and lists to be used in the application - Storing credentials for the cloud storage <p>A detailed CartoDB interface definition document will be provided to the Contractor at the Kick-Off meeting of the project.</p>	

Ref: IMS_INFO_03	Nature: Informative
Cloud storage	
The EMSA IMS mobile application uses Dropbox to store uploaded rich content (video, images and documents). A detailed interface with Dropbox will be provided at the Kick-Off meeting of the project.	
Ref: IMS_INFO_04	Nature: Informative
Oracle API Gateway	
<p>EMSA has implemented the Oracle API Gateway solution for the mobile application to interact with the existing IdM. This will:</p> <ol style="list-style-type: none"> 1) Provide user authentication 2) Allow access to EMSA resources 3) Provide login / logout functionalities 4) Identify the user's role <p>Detailed documentation regarding EMSA's Oracle API Gateway is provided in Appendix B.</p> <p>The contractor is not responsible for changes to the Oracle API Gateway. The IMS mobile application will interact with these web services that provide authentication services, enabling access to resources.</p>	
Ref: IMS_INFO_05	Nature: Informative
IMS mobile web-service	
The EMSA IMS mobile application consumes information provided by the IMS web services. These web services are deployed on top of EMSA's Oracle Service Bus. A complete description of the services, methods, calls and architecture are included in Appendix C to these technical specifications.	
Ref: IMS_INFO_06	Nature: Informative
WP1, WP2 and WP3 requirements	
The requirements presented in this Annex shall be implemented by the contractor for further develop the existing IMS mobile applications. The objective is not to fully re-implement the existing application.	

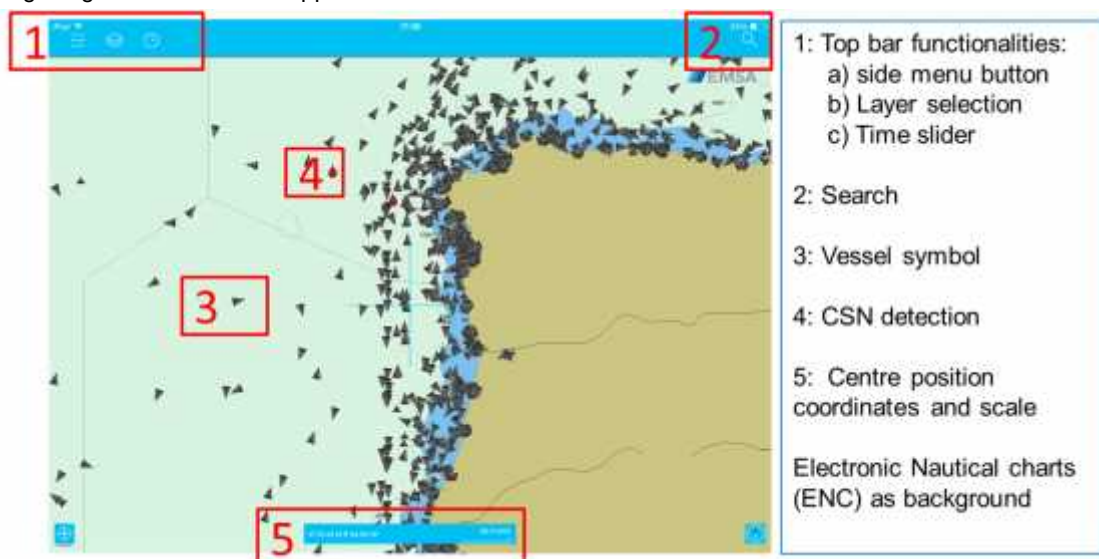
Global overview of current implementation

The overall architecture of the current implementation can be found in the following image.



IMS application - main application screen

The following image shows the main application screen:

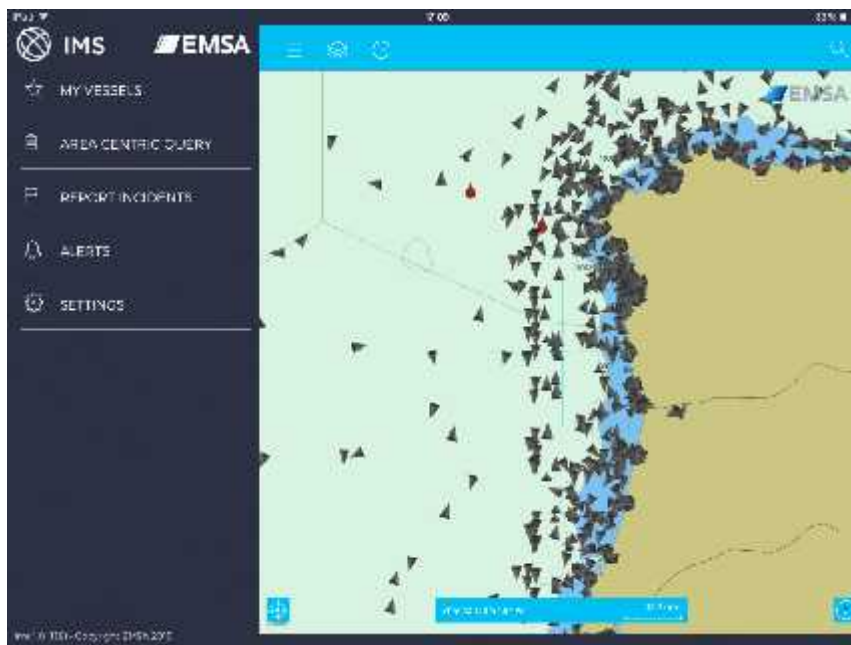


Ref: IMS_INFO_09

Nature: Informative

IMS Application - Side menu

The following image shows the side menu detail.



Ref: IMS_INFO_10

Nature: Informative

IMS Application – Vessel selection menu

The following image shows the vessel selection menu.

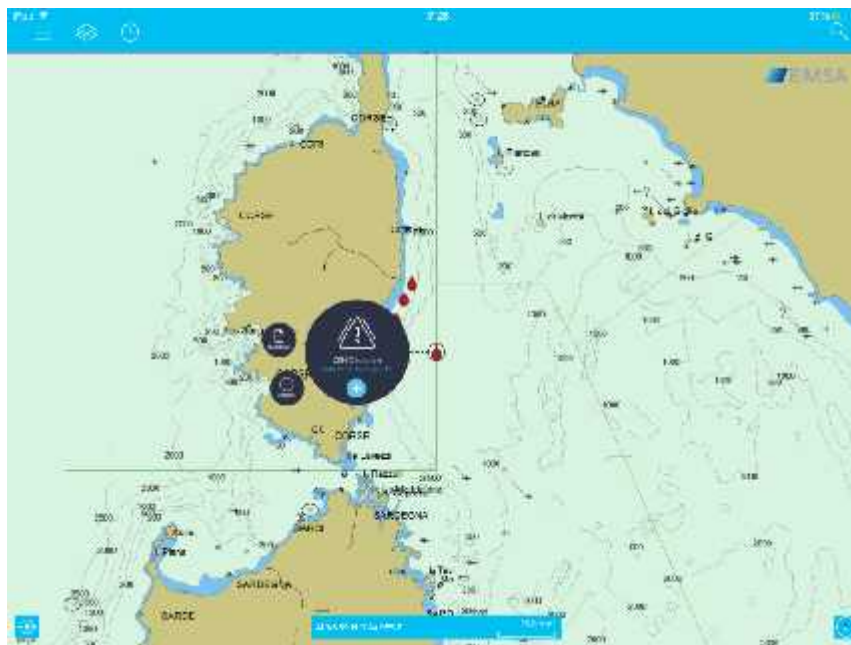


Ref: IMS_INFO_11

Nature: Informative

IMS Application – CSN detection menu

The following image shows the CSN detection selection menu.

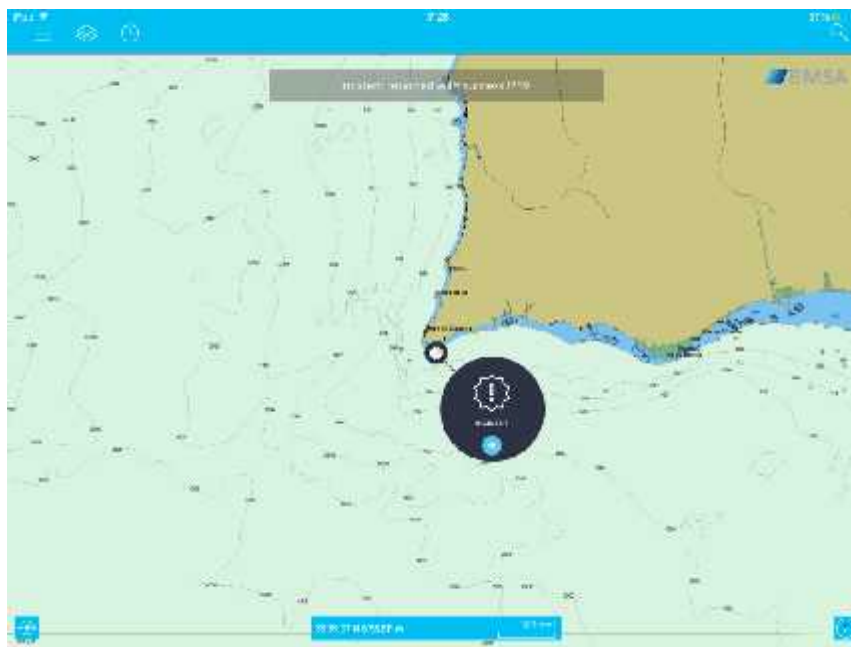


Ref: IMS_INFO_12

Nature: Informative

IMS Application – Incident detection menu

The following image shows the incident selection menu.

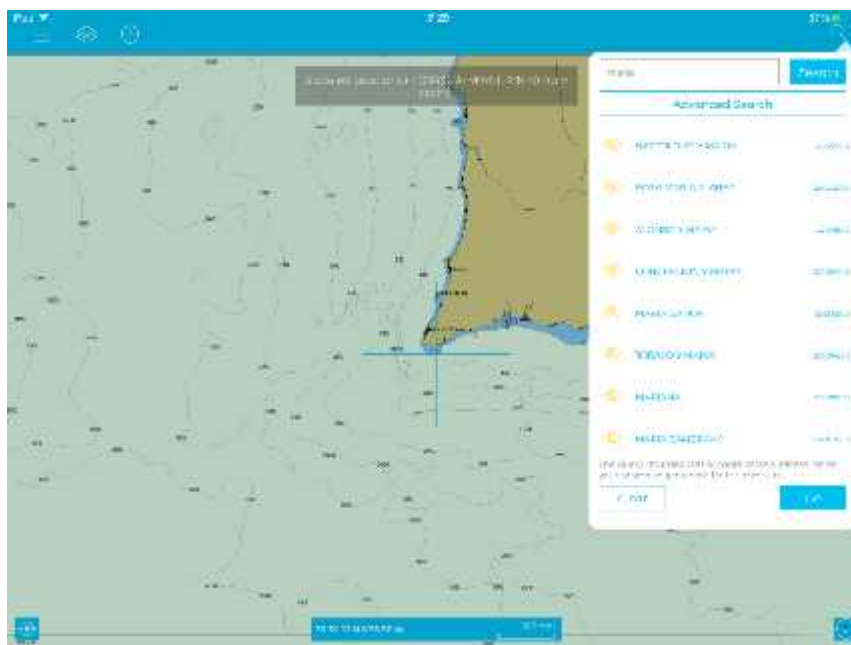


Ref: IMS_INFO_13

Nature: Informative

IMS Application – Basic search

The following image shows the basic search results.

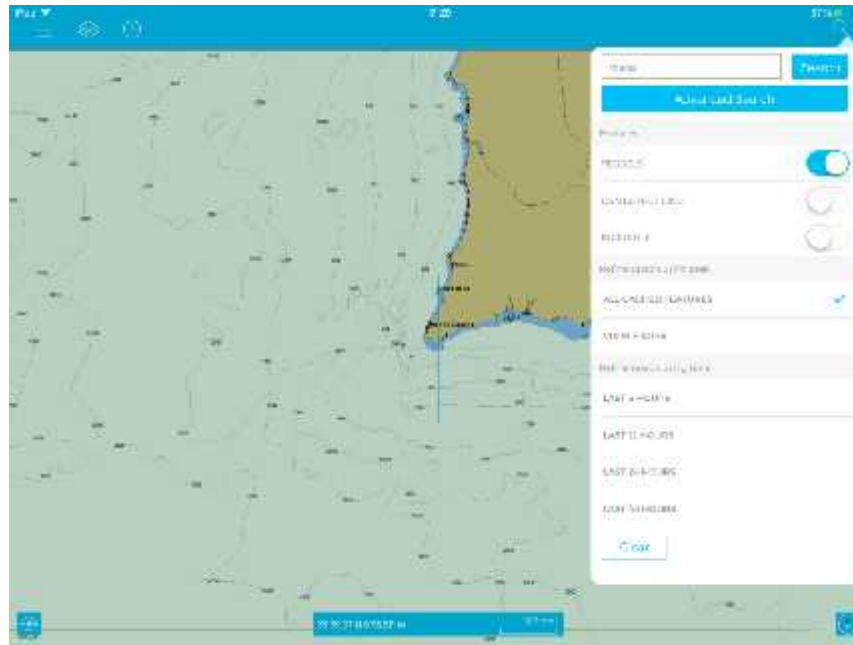


Ref: IMS_INFO_14

Nature: Informative

IMS Application – Advanced search

The following image shows the advance search menu.

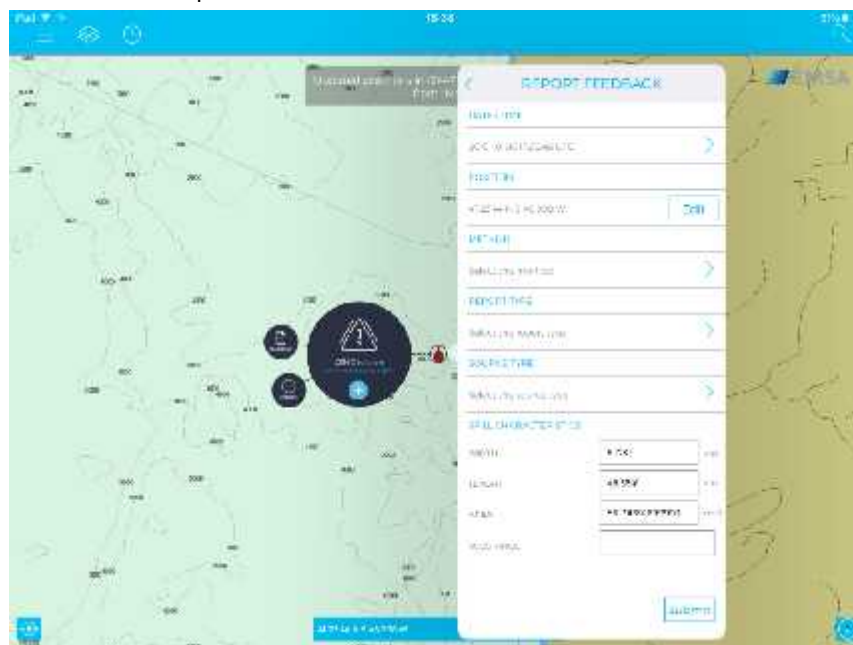


Ref: IMS_INFO_15

Nature: Informative

IMS Application – CSN feedback menu

The following image shows the CSN report feedback menu

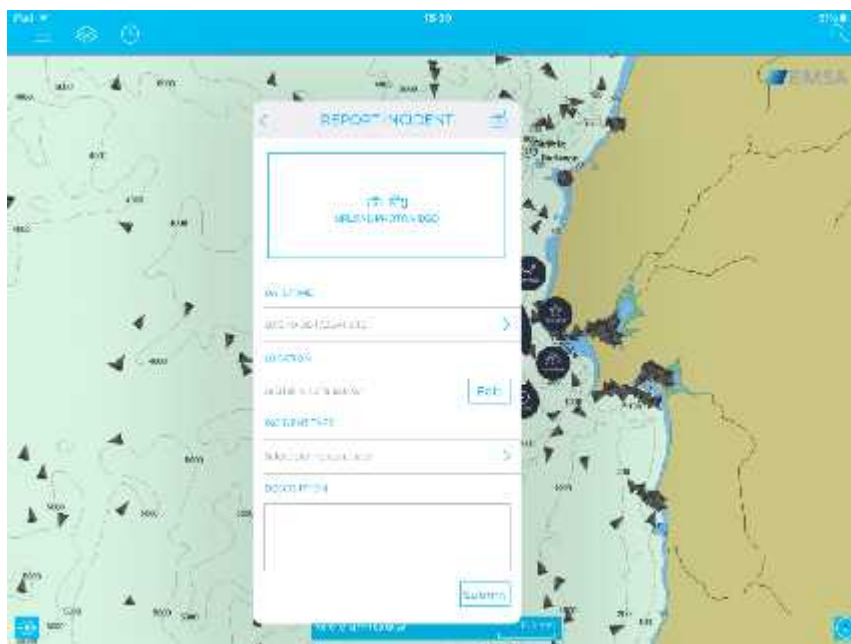


Ref: IMS_INFO_16

Nature: Informative

IMS Application – Incident feedback menu

The following image shows the Incident report menu



The screenshot shows a mobile application interface for reporting an incident. The background is a map of a coastal area. Overlaid on the map is a white form titled "REPORT INCIDENT". The form contains the following fields and options:

- A dropdown menu for "Vessel Type" with "SPEED BOAT" selected.
- A dropdown menu for "Vessel Registration" with "SPEED BOAT" selected.
- A dropdown menu for "Location" with "SPEED BOAT" selected.
- A dropdown menu for "Incident Type" with "SPEED BOAT" selected.
- A dropdown menu for "Incident Status" with "SPEED BOAT" selected.
- A dropdown menu for "Incident Date" with "SPEED BOAT" selected.
- A text input field for "Incident Description".
- A "Submit" button at the bottom right of the form.

Ref: IMS_INFO_17

Nature: Informative

Vessel cluster detail0

The following image shows the vessel cluster menu



1.5 Graphic design requirements

Ref: IMS_GRAPH_1	Nature: Mandatory
Generic requirements	
The graphic design of the IMS App, applicable for requirements addressed under WP1 and WP3, shall be object driven (objects being text, photos, images, still or animated graphics or videos) and customisable utilising the configuration interface). The level of customization will be defined by EMSA during the KO meeting of the project.	
Ref: IMS_GRAPH_2	Nature: Mandatory
Specific requirements	
The contractor shall provide at least 2 distinct design options for each of the necessary application screens, implementing the abovementioned use case and functionalities. These proposals shall include: <ul style="list-style-type: none"> ▪ Graphical elements to be used ▪ Wireframes of all the application pages ▪ Proposal for the workflow between the pages At the status meetings with the EMSA team the different graphical design approaches shall be presented by the contractor towards deciding the way forward in terms of graphic design. The different design approaches shall be applicable to all the requested mobile technologies (Android and IOS tablets and smartphones). EMSA reserves the right to request further changes to the proposals presented.	
Ref: IMS_GRAPH_3	Nature: Mandatory
General requirement	
The contractor shall abide as much as possible to EMSA's visual identity guidelines as included in Appendix F. This includes fonts, colours, distinctive elements, logos and others. Any deviation from the image requirements needs to be agreed upon with EMSA.	

2 WP1 – Mobile applications further developments

2.1 General requirements

Ref: IMS_WP1_01	Nature: Mandatory
Harmonized experience	
The bidder should follow OS guidelines in terms of generic functionalities (multi-gestures, zoom, etc.). For the implementation of specific functionalities of the EMSA IMS App the bidder should demonstrate providing a harmonized and seamless user experience between the two platforms.	
Ref: IMS_WP1_02	Nature: Mandatory
Technology	
The contractor shall implement the requirements of this annex using native applications for each platform, Android and iOS.	
Ref: IMS_WP1_03	Nature: Mandatory
Battery autonomy	
The implemented developments should take into account the battery drainage of the devices aiming to have a good battery/performance usage balance	
Ref: IMS_WP1_04	Nature: Informative

WP1 requirements scope	
All the WP1 requirements are applicable for the three versions of the mobile application: <ul style="list-style-type: none"> WP1.1 IMS App for iPad WP1.2 IMS App for iPhone WP1.3 IMS App for Android (tablet/Phone) 	
Ref: IMS_WP1_05	Nature: Mandatory
Privacy and data access on the device	
The application shall not require any extra permissions other than those needed for implementing the specified requirements (e.g. no need to access the user's contacts list or stored emails on the client side).	
Ref: IMS_WP1_06	Nature: Mandatory
iOS version	
The developments shall be compatible with IOS version 7 (or above). The contractor shall have the responsibility of updating the mobile application to any iOS changes for the duration of the project (including maintenance phase).	
Ref: IMS_WP1_07	Nature: Mandatory
Android version	
The developments shall be compatible with Android version 4.4 (or above). The contractor shall have the responsibility of updating the mobile application to any Android changes for the duration of the project (including maintenance phase).	

2.2 Functional requirements

2.2.1 New use Cases

Ref: IMS_WP1_08	Nature: Mandatory
Fisheries control use case	
The contractor shall implement a new use case linked with Fisheries reporting. This use case includes: <ul style="list-style-type: none"> Display of symbology associated with fisheries control Display of existing fisheries reports Provision of new fisheries reports (digital content and metadata to be uploaded to CartoDB and the cloud file storage) Display of notifications/alerts generated by specific "Surveillances" generated by the vessel behaviour algorithms Automatic generation of a PDF reports 	
Ref: IMS_WP1_09	Nature: Mandatory
Implementation approach	
The bidder shall provide a short description (this may include draft mock-ups, wireframes, ideas or others) that allows EMSA to understand how the bidder intends to implement the different user cases.	

2.2.2 General usability

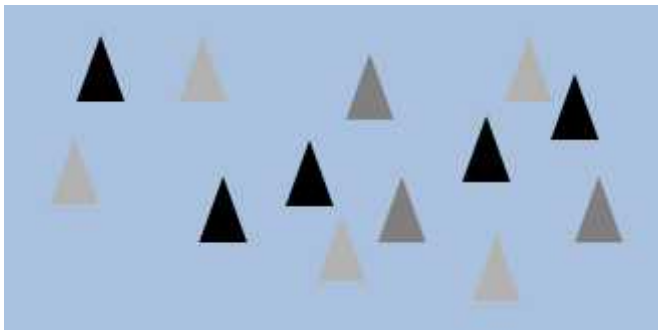
Ref: IMS_WP1_09A	Nature: Mandatory
Visibility of system status	
The system should always keep users informed about what is going on, through appropriate feedback within reasonable time. I.e. when search results exceeds certain number, when a query is being processed, or when a certain system process is taking excessive time the status information should be provided as much as possible to avoid the user "over	

clicking" on the screen or giving the idea that the mobile application is unresponsive.

2.2.3 Main application map

Ref: IMS_WP1_10	Nature: Mandatory
Main map elements	
Main map elements, such as: <ul style="list-style-type: none">▪ The top bar;▪ the centre coordinate information▪ the north arrow and the top bar Shall, as much as possible use bold and clean design to increase the visible area and make using the map easy for the users and save real-estate. The contractor shall propose changes to the main map area to reflect this requirement.	

2.2.4 Symbolologies

Ref: IMS_WP1_11	Nature: Mandatory
Vessel position Symbology	
The default symbology for vessel positions is the one currently implemented in the mobile application (single colour isosceles triangle with top vertex indicating the heading).	
Ref: IMS_WP1_12	Nature: Mandatory
Vessel symbology – Age of position	
The contractor shall implement a vessel symbology that indicates with a colour code the age of the vessel position displayed (5 classes will be implemented). This shall be implemented using: <ol style="list-style-type: none">1) Age of position reflected by different colours (i.e. blue recent, yellow 1 hour old, red more than one hour old)2) Age of position reflected by dimming / reducing visibility of the vessel symbol (please check image below). More recent position appears brighter where older positions appear dimmed.	
	
Ref: IMS_WP1_13	Nature: Mandatory
Vessel symbology – data source of position	
The contractor shall implement a vessel symbology that indicates the position type with a different colour. Example: <ol style="list-style-type: none">1) T-AIS is displayed in blue2) S-AIS is displayed in green3) LRIT is displayed in grey4) VMS is displayed in black Note: the data source is one of the elements being provided by the IMS mobile web-service, associated to each vessel	

position.	
Ref: IMS_WP1_14	Nature: Mandatory
Vessel symbology – IALA	
The contractor shall implement a vessel symbology that indicates the position type with a different colour. Specific information on this visualization will be provided by EMSA during the implementation.	
Ref: IMS_WP1_15	Nature: Mandatory
Vessel type symbols	
The contractor shall propose and implement a vessel symbology that represents the vessels by different types or dependent on the cargo carried (i.e. hazmat). The symbology of the different vessel types can expand the base symbology (i.e. adding a colour bar to the triangle defining a vessel and the colour would vary according to the ship type). The bidder shall propose at least one option for this symbology.	
Ref: IMS_WP1_16	Nature: Mandatory
Vessel symbology – filters	
It should be possible to implement filters to all symbologies. With a certain symbology activated the filter will be applied to restrict the visibility of vessels meeting certain criteria. These can include: <ol style="list-style-type: none"> 1) Visibility of vessels positions from certain source (i.e. only showing S-AIS) 2) Visibility of vessels of a certain type (i.e. only tankers). 	
Ref: IMS_WP1_17	Nature: Mandatory
Symbology Configuration	
The contractor shall implement a functionality that allows the user to quickly shift between vessel symbologies. The application shall retrieve the latest symbolizer configuration when a session is started. The bidder shall suggest ways to configure the toggle of the different symbologies (i.e. including a button in the top bar)	
Ref: IMS_WP1_17A	Nature: Mandatory
Dead-reckoning visualization	
From the vessel selection menu the contractor shall implement an option to enable / disable the vessels dead-reckoning information. Note: In navigation dead-reckoning is the process of calculating the vessels current position by using a previously determined position. This information is provided by an existing web-service.	

2.2.5 Map layers

Ref: IMS_WP1_18	Nature: Mandatory
Electronic Nautical chart service - enhancement in client side caching	
The contractor is expected to build upon the existing client side caching solution and provide: <ul style="list-style-type: none"> ▪ Increased performance in the display of ENC's ▪ Accurate measures of the ENC data stored on the device Configuration of caching parameters (i.e. tile retention time, overall cache size, offline area, etc.). Full set of configuration parameters will be discussed during implementation.	
Ref: IMS_WP1_19	Nature: Mandatory
Display of met-ocean layers	
The contractor shall implement visualization for the following met-ocean layers (source of the data will be existing external web-services to be provided during the implementation): <ul style="list-style-type: none"> ▪ Air temperature 	

<ul style="list-style-type: none"> ▪ Sea Surface temperature ▪ Wind speed and direction ▪ Cloud cover ▪ Ocean current 	
Ref: IMS_WP1_20	Nature: Mandatory
Display of met-ocean layers – visualization options	
The bidder shall propose two visualizations for each of the abovementioned layers. The contractor, after implementing changes proposed by EMSA, will implement one of the visualization options for the abovementioned layers.	
Ref: IMS_WP1_21	Nature: Mandatory
Additional map layers button	
<p>The top bar of the application should be extended to include a new button to enable/disable specific map layers. These will include:</p> <ul style="list-style-type: none"> ▪ Native Maps (basically toggle between ENCs and native Android or iOS maps) ▪ Air temperature ▪ Sea Surface temperature ▪ Wind speed and direction ▪ Cloud cover ▪ Ocean current 	

2.2.6 Land map visualization

Ref: IMS_WP1_22	Nature: Mandatory
Land maps (Bing maps / google maps)	
<p>The contractor shall implement visualization of specific maps for land areas. These can be:</p> <ol style="list-style-type: none"> 1) Google maps 2) Bing maps 3) Apple native maps <p>The visualization of these maps shall only be done for land areas. Over ocean areas the nautical charts and other map layers as previously described should still be visible.</p>	

2.2.7 Configuration menu requirements

Ref: IMS_WP1_23	Nature: Mandatory
General requirement	
IMS App configuration interface is intended to be used by users with a non-technical background. This requirement of simplicity and usage by non-technical personnel shall be reflected in the design and implementation of the configuration interface.	
Ref: IMS_WP1_24	Nature: Mandatory
Client side configuration - layers	
<p>The contractor shall include the following configuration options:</p> <ol style="list-style-type: none"> 1) Change units 2) Change background layers. Users can configure one of the aforementioned background maps (IMS) at client side. In this case, regardless the server side background configuration, the IMS App will consume the 	

background map configured by the user.	
3) Enable / disable layers 4) Configure caching of layers (vessels, background charts, etc.) 5) Configure user defined layers	
Ref: IMS_WP1_25	Nature: Mandatory
Configuration and management of uploaded content	
The contractor shall implement, in the configuration interface, functionalities that allow the users to: <ol style="list-style-type: none"> 1) Visualize a list of their previously uploaded information (video, photos, text) 2) Edit / Delete the uploaded information 	
Ref: IMS_WP1_26	Nature: Mandatory
Summary list of uploaded content	
From the side menu the user shall be able to visualize a summary list of all uploaded content. This includes: <ol style="list-style-type: none"> 1) CSN feedback reports 2) Incidents 3) Fisheries reports 	
Ref: IMS_WP1_27	Nature: Mandatory
Summary list of uploaded content - functionality	
The summary list of uploaded content shall allow: <ol style="list-style-type: none"> 1) Edit content 2) Delete content 3) Sort content The list should present the results sorted by type and then (i.e. All CSN feedbacks sorted with newest first).	
Ref: IMS_WP1_28	Nature: Mandatory
Cluster grid line configuration	
The contractor shall implement in the configuration menu the ability to customize the grid line (used to draw the vessel clusters). Configuration items should include: <ol style="list-style-type: none"> 1) Line colour 2) Line thickness 3) Opacity / transparency (in %) 	
Ref: IMS_WP1_29	Nature: Mandatory
Clear Cache	
The contractor shall implement in the configuration menu the ability to clear all cached information from the device. This includes: <ol style="list-style-type: none"> 1) Alerts 2) Incidents 3) CSN Feedbacks 4) Vessel positions 5) Vessel tracks 6) Map layers 7) ENC's 	

2.2.8 Favourite vessel list

Ref: IMS_WP1_30	Nature: Mandatory
Favourite vessel list – predefined list	
<p>The contractor shall implement functionalities that allow the user to load a predefined list of favourite vessels. This shall include:</p> <ul style="list-style-type: none"> ▪ Copy paste a list of MMSI or IMO ▪ Introduce a list in a CartoDB table. This list can be changed by the EMSA administrator and configured on a per user / per role level. 	
Ref: IMS_WP1_31	Nature: Mandatory
Favourite vessel list – show tracks	
<p>The contractor shall implement functionalities that allow to automatically show the tracks (default 24 hours) for all vessels in the favourite vessel list.</p>	
Ref: IMS_WP1_32	Nature: Mandatory
Favourite vessel list – highlight vessels	
<p>The contractor shall implement functionalities that highlight the favourite vessels on the map screen.</p>	
Ref: IMS_WP1_33	Nature: Mandatory
Favourite vessel list – add label	
<p>The contractor shall implement a functionality that allows the user to add a label per vessel, in the vessel list.</p>	
Ref: IMS_WP1_34	Nature: Mandatory
Favourite vessel list – risk level	
<p>The contractor shall implement a functionality that allows adding risk levels to vessels. The risks can be High, Moderate or Low.</p>	
Ref: IMS_WP1_35	Nature: Mandatory
Favourite vessel list – vessel label on map	
<p>The contractor shall implement a functionality that allows the display of the vessel label, from the favourite vessel list, on the map (on top or near the vessel position). Label conflict rules should be enforced to avoid overlay and confusion in terms of visualization.</p>	

2.2.9 Features of interest

Ref: IMS_WP1_36	Nature: Mandatory
Features of interest	
<p>The mobile application shall be able to retrieve from an existing web-service (development of this web-service is outside of the scope of this project), a list of features of interest to be used in searches. These can include:</p> <ul style="list-style-type: none"> ▪ Area of interest (AOI) ▪ Target of Interest (TOI) ▪ Point of Interest (POI). <p>Making use of the web-service mentioned above it should be possible to add AOI, TOI, and POIs to the existing list via the mobile application.</p>	

2.2.10 Playback functionality

Ref: IMS_WP1_37	Ref: IMS_WP1_34
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Replay function – general requirement	
<p>The contractor shall implement a replay functionality to replay of the movement over a pre-defined period of time (12,24 or 48 hours), of:</p> <ul style="list-style-type: none"> ▪ Single vessel ▪ List of vessels (i.e. My favourite vessel list) ▪ Vessels retrieved via an Area Centric query. <p>The Play/Replay shall be available for selected vessels with a minimum number of actions required by the user.</p>	
Ref: IMS_WP1_38	Ref: IMS_WP1_35
Replay – zooming and panning	
<p>The zooming and panning as well as the basic map interactions shall be possible once the ACQ and Play/Replay are activated.</p>	

2.2.11 Vessel track

Ref: IMS_WP1_39	Nature: Mandatory
Vessel track – general requirement	
<p>The vessel track shall show the individual positions that are used to construct the track line.</p>	
Ref: IMS_WP1_40	Nature: Mandatory
Vessel track – concurrent number of tracks	
<p>The user shall have the possibility to overlay up to multiple vessel tracks on the map (up to 20 tracks)</p>	
Ref: IMS_WP1_41	Nature: Mandatory
Vessel track – source position information – source type	
<p>The user shall be able to display a label or specific symbol that identifies the type of positions used to construct a track (i.e. if the position is AIS, LRIT, VMS, etc.) Label conflict avoidance rules (i.e. multiple positions in the same area which would result in overlaid labels) shall be enforced to minimize visualization issues.</p>	
Ref: IMS_WP1_42	Nature: Mandatory
Vessel track – source position information – date / time	
<p>The user shall be able to display a label that identifies the time of positions used to construct a track. Label conflict avoidance rules (i.e. multiple positions in the same area which would result in overlaid labels) shall be enforced to minimize visualization issues.</p>	
Ref: IMS_WP1_43	Nature: Mandatory
Vessel track – show related features	
<p>The user shall be able to visualize the CSN detections, alerts and incidents related to a vessel along its track.</p>	

2.2.12 Smart search functionality

Ref: IMS_WP1_44	Nature: Mandatory
Smart search functionality	
<p>The contractor shall implement a smart search functionality that allows the user to search for the specific data type values which are currently displayed on the map. When typing text, the application will immediately display/filter all results including Identified or named elements/layers:</p> <ul style="list-style-type: none"> ▪ vessels' identifiers, ▪ detected/confirmed or potential pollutions; 	

<ul style="list-style-type: none"> ▪ EO planned and delivered acquisitions, ▪ Authority identifiers 	
Ref: IMS_WP1_45	Nature: Mandatory
Smart search functionality – Save	
<p>The user shall be able to:</p> <ul style="list-style-type: none"> ▪ Save the last search criteria for reusability <p>When search is performed always the latest position(s) of vessel(s) is displayed</p>	
Ref: IMS_WP1_46	Nature: Mandatory
Smart search functionality – Alert messages	
<p>Should the search criteria be too large, the user shall be informed with an alert message indicating the cause of the warning.</p>	
Ref: IMS_WP1_47	Nature: Mandatory
Smart search functionality –Export and send	
<p>The user shall be able send the search result as csv, xls to email or cloud storage application installed (i.e. dropbox, onedrive, google drive, etc.. The export and send function should follow a typical mobile app navigation setting for these features and include:</p> <ul style="list-style-type: none"> ▪ Press “export functionality” button ▪ Choose format (default is pre-marked) ▪ Choose destination 	

2.2.13 Area centric query

Ref: IMS_WP1_48	Nature: Mandatory
Area centric query – vessel list	
<p>The current implementation of the area centric query shows vessel positions on the map that fit a set of user defined criteria. Additionally to the implemented functionality the user shall be able to:</p> <ol style="list-style-type: none"> 1) Visualize a summary table of name, MMSI of displayed vessels and flag (design details for this table will be decided during implementation) 2) Refine the search within the displayed vessels (remove a vessel and/or re-define other criteria, such as data sources) 3) Highlight vessels that are in the table. <p>The bidder shall propose a way to implement this list that is adjusted with the smartphone and tablet versions.</p>	
Ref: IMS_WP1_49	Nature: Mandatory
Area centric query – performance enhancements	
<p>The contractor shall explore ways of increasing the performance of the area centric query by:</p> <ol style="list-style-type: none"> 1) Re-defining how the requests are made to the web-services 2) Reassessing the way the tracks and positions within an area centric query are displayed on the application 3) Proposing changes to the IMS web-services, to be included in WP2 that may improve the performance of this functionality. 	

2.2.14 Cluster enhancements

Ref: IMS_WP1_50	Nature: Mandatory
Cluster and vessel display improvements	

Currently there are some performance issues when displaying a larger number of vessels and/or creating the vessel clusters using the grid service. The contractor shall re-design the current cluster display to enhance the performance in slower devices and in the Android versions (that currently suffer from more performance issues than iOS).

2.2.15 Custom area visualization

Ref: IMS_WP1_51	Nature: Mandatory
Display of user specific areas	
<p>The contractor shall implement in the mobile application the display of user specific areas. From CartoDB the user specific areas should be possible to be loaded in the catalogue and used in the mobile application. It should be possible to restrict the visualization of the areas to:</p> <ul style="list-style-type: none"> ▪ Public (visible to all users) ▪ User limited (visible to just one user) ▪ Role limited (visible to users of a specific role) ▪ Country (visible to users of a specific country) 	

2.2.16 Filter

Ref: IMS_WP1_47A	Nature: Mandatory
Display of user specific areas	
<p>The contractor shall implement in the mobile application a filtering functionality that allows:</p> <ul style="list-style-type: none"> ▪ Filtering of vessels per time ▪ Filtering of vessels per data source ▪ Filtering of vessels per flag 	

2.2.17 Export to file

Ref: IMS_WP1_48A	Nature: Mandatory
Display of user specific areas	
<p>The contractor shall implement functionality that allows the user to:</p> <ol style="list-style-type: none"> 1) Generate a png or pdf with the contents of the screen currently be visualized 2) Store the generated file on the device and/or send it by email / dropbox / google drive, etc. 	

2.2.18 User Authentication

Ref: IMS_WP1_49A	Nature: Mandatory
User authentication – graphical implementation	
<p>The contractor shall implement a login screen that is aligned with the look and feel of the EMSA's Maritime Application Portal (MAP).</p>	



The login screen may be adjusted to adapt to the reality of mobile devices (i.e. smaller screen size, etc.).

2.2.19 Vessels nearby

Ref: IMS_WP1_50A	Nature: Mandatory
Vessels nearby	
<p>The contractor shall implement a function called “vessels nearby” that based on the either the user location (gps coordinated) or the vessel selected, will list vessels sorted by distance and include:</p> <ol style="list-style-type: none"> 1) Visualize as a table with name, MMSI of displayed vessels, flag and age of the position (design details for this table will be decided during implementation) or as thumbnails. 2) Refine the search within the displayed vessels (remove a vessel and/or re-define other criteria, such as data sources) 3) Highlight vessels that are in the table. <p>The bidder shall propose a way to implement this list that is adapted to the smartphone and tablet versions.</p>	
Ref: IMS_WP1_51A	Nature: Mandatory
Vessels nearby - configuration	
<p>The contractor shall implement, in the configuration menu, a maximum distance parameter, to be used in the nearby vessel search.</p>	

2.2.20 CSN detections

Ref: IMS_WP1_52	Nature: Mandatory
CSN detections – possible source	
<p>The contractor shall implement a functionality that allows the visualization of a vessel or vessels associated with a CSN detection</p>	
Ref: IMS_WP1_53	Nature: Mandatory
CSN detections – visualization of feedbacks	
<p>The contractor shall implement a functionality that allows the visualization of CSN detections that have associated</p>	

feedbacks.

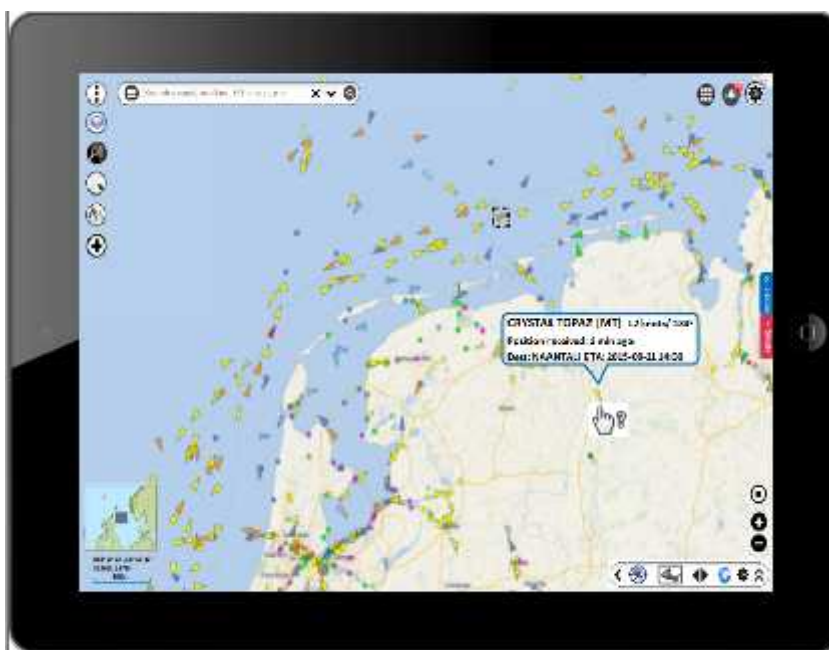
2.2.21 Tooltip functionality

Ref: IMS_WP1_54

Nature: Mandatory

Tool tip functionality

The contractor shall implement in the main map a “tool tip enable” functionality that will activate a pointer providing information on features on the screen.



2.2.22 Public application

Ref: IMS_WP1_55

Nature: Information

EMSA public application

EMSA is considering launching an application to display information that is open to the general public. This application will use the functionalities described in WP1 and WP3 and aims at providing data that does not have intellectual property right distribution restrictions or where EMSA has the total ownership.

Ref: IMS_WP1_56

Nature: Information

EMSA public application - development

The public application will not entail separate development efforts but just configuration of data streams to be displayed in the same technical framework. It is expected that most of the effort linked with this public application (besides a parallel deployment to the public app stores) is on configuration of the data-streams to be provided and restriction of certain functionalities.

Ref: IMS_WP1_57


Nature: Mandatory

Access without login

EMSA is considering launching an application to display information that is open to the general public. The public application shall allow access to defined public services without any credentials.

Ref: IMS_WP1_58	Nature: Mandatory
Login with Facebook account	
EMSA is considering launching an application to display information that is open to the general public. To this extent the contractor shall implement the ability to login to the public application using the users' Facebook account.	
Ref: IMS_WP1_59	Nature: Mandatory
Provision of feedback for facebook accounts and non-registered users	
Users of the public application shall be able to provide feedback to specific elements (i.e. oil spills). This feedback is to be stored in the cloud catalogue but separated from the feedback provided by authorized users. Feedback provided by non-registered users will have to be confirmed by the provision of user related information (email and name).	

2.2.23 Main vessel menu

Ref: IMS_WP1_59A	Nature: Mandatory
Vessel selection menu additional items	
Currently the vessel selection menu (figure bellow):	
	
The contractor shall add on the vessel selection menu the heading and speed. The contractor shall produce at least two new visualization options that also integrate the abovementioned items to be analysed by EMSA.	

2.2.24 Interaction with Oracle API Gateway

Ref: IMS_WP1_60	Nature: Mandatory
Roles	
Roles are used to define access to a particular function or functions associated with each user, according to a particular scope. As an example, a role named INSPECTOR is likely to have access definitions relevant to the specific options delegated to it.	
The role shall be used by the application to customize the level of functionality available. Specific details regarding which functionalities will be available to each of the roles will be decided by EMSA during the implementation of the project.	
Ref: IMS_WP1_61	Nature: Mandatory
Interaction with the Oracle API Gateway	
Interaction with the Oracle API gateway is implemented in the existing mobile applications. The contractor is responsible to ensure that new functionalities, and access to any new resources implemented under this contract, still make use of the Oracle API gateway for authentication purposes.	

2.3 Non-Functional requirements

Ref: IMS_WP1_62	Nature: Mandatory
Generic non-functional requirements	
IMS App architectural design and implementation shall be fully in-line with requirements included in the technical landscape document in Appendix A.	
Ref: IMS_WP1_63	Nature: Mandatory
Scalability, Resilience and High Availability	
<p>Bidders shall address how the system responds to the several non-functional characteristics, namely:</p> <ul style="list-style-type: none"> ▪ Scalability, ▪ Availability ▪ Performance ▪ Usability ▪ Resilience. 	
Ref: IMS_WP1_64	Nature: Mandatory
Electronic Nautical chart service - Performance	
Any user interaction with map, as for example: zoom in/out, pan, toggle layers, etc. shall provide immediate user feedback and fully complete the task within 1 second. In order to achieve these performance requirements the bidder shall take into account a client side caching solution.	
Ref: IMS_WP1_65	Nature: Mandatory
Offline usage and caching	
The contractor shall take into account that the implementation of the use cases requires storage of the data on the device (background layers, latest position of vessels, etc.). Furthermore, and in case of offline usage, content to be uploaded (photos, reports, videos, and all associated metadata) shall be stored on the device and uploaded when connectivity is available.	
Ref: IMS_WP1_66	Nature: Mandatory
General responsiveness of the application	
The contractor shall ensure that implemented features should, for the majority of devices, be responsive and delivery the respective functionality in a timely manner ensuring a good navigational and user experience. This usually implies that any functionality provides response to the user in less than one second.	

3 WP2: IMS web services further developments

3.1 Functional requirements

3.1.1 WP2.1 IMS Web Services

Ref: IMS_WP2_05	Nature: Mandatory
Implement IMDATE GetCorrectedPositions service	
IMDATE implemented a new service that provides corrected positions with Doppler shift information. The contractor shall	

implement a call to this service in the IMS web services. Full documentation on the new IMDATE service will be provided at kick-off.	
Ref: IMS_WP2_05A	Nature: Mandatory
Implement IMDATE GetIMDATE id service	
IMDATE implemented a new service that is used to retrieve the IMDATE ID of any vessel. The contractor shall implement a call to this service in the IMS web services. Full documentation on the new IMDATE service will be provided at kick-off.	
Ref: IMS_WP2_06	Nature: Mandatory
Position service correction – display last position (global)	
Currently the position service returns the last position per data sources (T-AIS, S-AIS, LRIT, etc.). The contractor shall implement in the IMS web services a method to sort the last position globally, regardless of the source.	
Ref: IMS_WP2_07	Nature: Mandatory
Enhancement of current cluster implementation (IMS grid web service)	
Currently there are some performance issues in displaying larger number of vessels and/or creating the vessel clusters using the grid service. The contract shall propose enhancements to the current IMS grid web service to reduce the load on the client side.	
Ref: IMS_WP2_08	Nature: Mandatory
Area Centric query - getTracksByBoundingBox	
The contractor shall improve the area centric query implementation to allow the display of all vessels over a certain area for a defined time period. The current implementation only provides the tracks for vessels where the last known position is reported over the query area.	
Ref: IMS_WP2_09	Nature: Mandatory
Assessment of WP1 functionalities in terms of IMS web-services impacts	
The contractor shall assess the new functionalities related with WP1. If there are impacts at the web-service level these should be reflected in the scope of WP2.	
Ref: IMS_WP2_10	Nature: Mandatory
Documentation for new developments	
Further developments on the IMS web services should abide with the current architecture concepts, as defined in Appendix C. The contractor shall update the current architecture document with the new developments, to be approved by EMSA, before the development is initiated.	

3.1.2 WP2.2 CartoDB

Ref: IMS_WP2_11	Nature: Mandatory
Metadata	

For each of the multimedia content uploaded a document describing the content itself needs to be created (i.e. metadata). At least the following information that describe the multimedia content shall be recorded:

- Identification (unique resource identifier, resource title, resource description, resource type, resource language);
- Resource Keywords;
- Geographic Location (preferable Latitude and Longitude in EPSG 4326 as coordinate reference system),
- Temporal Reference (described in ISO 19108 for example)
- Responsible Party (identification of the organization, identification of the user, identification of the device, user role);
- Resource locator (which point to the location (URL) where the multimedia content can be located).

The contractor shall as much as possible create the aforementioned metadata in automatic way, therefore without the needs for users to fill-in information.

EMSA suggests to use standards metadata for describing the content of the digital document uploaded by the users (for example ISO 19115 and the INSPIRE metadata for datasets), and when and if it is necessary, the contractor shall extend the metadata with additional information.

Ref: IMS_WP2_12	Nature: Mandatory
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User specific areas in CartoDB

The contractor shall implement in CartoDB user specific areas to be loaded in the catalogue and used in the mobile application. For each area the following elements should be implemented:

- Visualization restrictions:
 - Public (visible to all users)
 - User limited (visible to just one user)
 - Role limited (visible to users of a specific role)
 - Country (visible to users of a specific country)
- Area type (types to be defined in a separate CartoDB table)
- Display conditions (line thickness, line colour, etc.)

Ref: IMS_WP2_13	Nature: Mandatory
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User specific areas - changes

Changes to the user specific areas should not entail re-deployment of the mobile application or of the IMS web services.

Ref: IMS_WP2_14	Nature: Mandatory
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Dropdown lists items - CartoDB

The contractor shall implement all dropdown list items of the mobile applications as tables in CartoDB so that they are fully configurable. This will include:

- Add item
- Remove item
- Update item

Ref: IMS_WP2_15	Nature: Mandatory
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Configuration items – CartoDB

The IMS mobile application currently has a configuration menu where the user selects several settings. The contractor shall implement the storage of these configurations on CartoDB, so that when a user logs in with a different device the configurations are retrieved from CartoDB. Configurations will include (but are not restricted to):

- My vessels
- Units
- Offline area definition
- Query windows (CSN detections, Incidents, etc.)

<ul style="list-style-type: none"> Other configurations to be defined during implementation 	
Ref: IMS_WP2_16	Nature: Mandatory
Configuration and management of uploaded content – EMSA administrator access	
<p>The contractor shall implement, in the configuration interface, functionalities that allow the EMSA authorized administrators to:</p> <ol style="list-style-type: none"> Visualize a list of previously uploaded information (video, photos, text) for all users Edit / Delete the uploaded information for all users 	

3.2 WP2 Non-Functional requirements (valid for WP2.1 and WP2.2)

Ref: IMS_WP2_17	Nature: Mandatory
Generic non-functional requirements	
<p>The IMS web services developments shall be fully in-line with requirements included in the technical landscape document in Appendix A and aligned with the Architecture document as described in Appendix C.</p>	
Ref: IMS_WP2_18	Nature: Mandatory
Sizing requirements	
<p>The developments on the IMS web services shall take into consideration that EMSA's user are growing at a moderate yearly rate (less than 10%) and that the following sizing requirements should be met:</p> <ul style="list-style-type: none"> Expected maximum number of users: 5000 Expected maximum number of concurrent users: 200 <p>Bidders shall consider the current EMSA PRODUCTION infrastructure as a baseline.</p>	
Ref: IMS_WP2_19	Nature: Mandatory
Scalability, Resilience and High Availability	
<p>Bidders shall address how the system responds to the several non-functional characteristics, namely:</p> <ul style="list-style-type: none"> Scalability, Availability Performance Usability Resilience. 	

4 WP3: Convergence with EMSA's SafeSeaNet Ecosystem new developments

4.1 General requirements

Ref: IMS_WP3_01	Nature: Informative
WP3 requirements scope	
<p>All the WP3 requirements are applicable for the three versions of the mobile applications:</p> <ul style="list-style-type: none"> IMS App for iPad 	

- App for iPhone
- IMS App for Android (tablet/Phone)

4.2 Alignment with SSN ecosystem graphical interface

Ref: IMS_WP3_02	Nature: Informative
EMSA SafeSeaNet Ecosystem Single Graphical Interface (SEG) - General requirements	
A significant design effort may be required to align to the SEG project. This project will go-live in middle 2016 and it is expected that the contractor does general adaptations of the look and feel of the application to align in terms of consistency with the SEG.	
Ref: IMS_WP3_03	Nature: Mandatory
SEG - Iconography consistency	
The contractor shall implement the icons and other symbols on the IMS App ensuring, as much as possible, consistency with the SEG. This will ensure that users can establish points of parity between both applications.	

4.3 Alignment with Earth Observation Data Centre

Ref: IMS_WP3_04	Nature: Mandatory
IMS Web Services – CSN feedback to EOS	
Currently the CSN feedback is stored in the CartoDB DB. When a CSN feedback web services will be available in the EODC, the contractor shall implement the connection to this service as a IMS web service. The IMS mobile application will then use the new web-service to report CSN feedbacks.	
Ref: IMS_WP3_05	Nature: Mandatory
IMS Web Services – Incident information to EOS	
Currently the Incident report information is stored in the CartoDB DB. When an Incident report service will be available in the EODC, the contractor shall implement the connection to this service as a IMS web service. The IMS mobile application will then use the new web-service to report incidents.	
Ref: IMS_WP3_06	Nature: Mandatory
IMS Web Services – Retrieval of EO related information	
The contractor shall implement in the IMS web-services the retrieval, from the respective EO DC web-service, of EO planning information. This will include: <ul style="list-style-type: none"> 1) Status of the images (planned, ordered, delivered, cancelled, anomaly) 2) Basic information of the image (ID, start-stop time, type, satellite, etc.) 3) Geographical coverage of the image 	
Ref: IMS_WP3_07	Nature: Mandatory
IMS mobile applications – CSN feedback report form alignment	
The contractor shall implement the icons and other symbols on the IMS App ensuring, as much as possible, consistency with the SEG. This will ensure that users can establish points of parity between both applications.	
Ref: IMS_WP3_08	Nature: Mandatory

IMS mobile applications – Incident report form alignment	
The contractor shall implement the icons and other symbols on the IMS App ensuring, as much as possible, consistency with the SEG. This will ensure that users can establish points of parity between both applications.	
Ref: IMS_WP3_09	Nature: Mandatory
IMS mobile applications –Display of EO information	
<p>The contractor shall implement the display of EO information. This will include the:</p> <ol style="list-style-type: none"> 1) Status of the images (planned, ordered, delivered, cancelled, anomaly) 2) Basic information of the image (ID, start-stop time, type, satellite, etc.) 3) Geographical coverage of the image 	
Ref: IMS_WP3_10	Nature: Mandatory
IMS mobile applications –Display of EO data planning information - configuration	
The contractor shall implement a way to configure the query window (spatially and temporally), type (optical or radar), or satellite of the EO information.	

5 WP4 - Maintenance

Ref: IMS_WP4_01	Nature: Mandatory
Warranty	
<p>The contractor shall provide warranty support to all elements of IMS App that are part of the requirements in WP1, WP2. Any defects linked with functionalities that are part of the abovementioned requirements shall be promptly rectified by the contractor as part of the warranty support. There shall not be any cost to EMSA linked with warranty related actions. Warranty shall be provided up to two years for all deliverables.</p>	
Ref: IMS_WP4_02	Nature: Mandatory
General requirements	
<p>Maintenance is deemed to comprise of all operations necessary to maintain the system in perfect working order, or to restore a defective system or one of its components to perfect working order, inclusive of the costs of travelling and labour, if necessary.</p> <p>Corrective maintenance is the reactive modification of a software product performed after delivery to correct discovered problems.</p> <p>Preventive maintenance is the modification of a software product after delivery to detect and correct latent faults in the software product before they become effective faults. The system has to be updated to the most recent versions of the underlying software implemented.</p> <p>Once implementation of WP1, WP2 and WP3 is concluded the Contractor will provide the corrective and preventive maintenance of the system necessary to ensure the required level of operational performance. Maintenance shall be provided on year after WP3 is concluded.</p> <p>The contractor shall adhere to the general EMSA requirements linked with project maintenance, presented in Appendix E.</p>	
Ref: IMS_WP4_03	Nature: Mandatory
Main deliverables	
<p>The main deliverables that are to be produced in the context of maintenance activities are:</p> <ul style="list-style-type: none"> ▪ Monthly Maintenance Reports and Statistics on maintenance activities described in the context of Service Level Management. ▪ Change Management Documents for each change submitted to the Change Management Process. It must include at least, Change Request Form, Evaluation of the Change, Planning and Acceptance ▪ Updated versions of the system deliverables (design documentation, test documentation, user documentation, system documentation, software releases and release notes) for each change implemented and submitted to the Release Management Process. 	
Ref: IMS_WP4_04	Nature: Mandatory
Service levels	
<p>Occurrences (Incidents/Defects or Findings) considered as blocking (no service being provided) will have Priority = Highest. A dedicated phone line shall be available 24x7 for handling this type of occurrences.</p> <p>Occurrences (Incidents/Defects or Findings) significantly impacting the one or more components causing a partial loss of the service provided or foreseen to be blocking during the next 2 days will have Priority = High.</p> <p>Occurrences (Incidents/Defects or Findings) significantly impacting the one or more components with reduction of service provided (e.g. affecting performance) or foreseen to be blocking during the next week will have Priority = Medium.</p> <p>Service levels for corrective maintenance (Incidents/Defects) shall be:</p>	

	<table><tr><th>Priority</th><th>Acknowledge time</th><th>Solve time</th></tr><tr><td>Highest</td><td>Immediately, 24/7 basis</td><td>Immediately</td></tr><tr><td>High</td><td>3 working hours, 7/5 basis</td><td>1 working day</td></tr><tr><td>Medium</td><td>2 working days, 7/5 basis</td><td>7 working days</td></tr></table>	Priority	Acknowledge time	Solve time	Highest	Immediately, 24/7 basis	Immediately	High	3 working hours, 7/5 basis	1 working day	Medium	2 working days, 7/5 basis	7 working days
Priority	Acknowledge time	Solve time											
Highest	Immediately, 24/7 basis	Immediately											
High	3 working hours, 7/5 basis	1 working day											
Medium	2 working days, 7/5 basis	7 working days											
Ref: IMS_WP4_05	Nature: Mandatory												
Processes and management plans													
<p>The contractor shall abide to the requirements present in Appendix E regarding service delivery and working procedures. Occurrences (Incidents/Defects or Findings) considered as blocking (no service being provided) will have Priority = Highest. A dedicated phone line shall be available 24x7 for handling this type of occurrences. In order to support the services for maintenance, at least the following Processes and Management plans must be in place:</p> <ul style="list-style-type: none">▪ Change management▪ Release management▪ Incident management▪ Problem management▪ Service level management <p>Requirements on these plans are included in Appendix E.</p>													
Ref: IMS_WP4_06	Nature: Mandatory												
Support in testing of underlying business services													
<p>As the IMS web services orchestrate requests to other EMSA web-services the contractor shall provide testing support (in terms of validation and identification of errors generated by the IMS web service) to new deployments of other EMSA web services.</p> <p>Example:</p> <p>A new version of IMDATE is released with a change to the position web-service. The contractor shall support EMSA in identifying if this change affects the IMS web service and/or the IMS mobile application. If minor corrections on the IMS web services or IMS application are needed they should be handled under the maintenance,</p>													

6 Testing and project delivery requirements

6.1 Mobile application deployment

Ref: IMS_TEST_01	Nature: Informative
Mobile device management solution	
<p>EMSA is using the mobile device management solution Airwatch, for deployment of the app for testing purposes. This MDM solution allows:</p> <ul style="list-style-type: none"> ▪ Support to “bring your own device” (BYOD) ▪ Deployment of apps both in iOS and Android ▪ Mobile browsing management, including configure of mobile access gateway ▪ App wrapping ▪ Establishment of development workflows (split the application development into steps and assign them to different users). When a development step is completed, users assigned to next step are automatically notified. The entire workflow process can be repeated for each new version of the application. 	
Ref: IMS_TEST_02	Nature: Informative

Mobile device management solution – Management of deployment	
For the duration of the project, (including maintenance phase) the contractor shall be responsible for the management of AirWatch MDM for the purpose of deploying the develop apps for testing purposes. This includes deployment to EMSA staff and a restricted number of end users.	
Ref: IMS_TEST_03	Nature: Informative
Deployment in public application stores (i.e. Apple Store and Google Store)	
The contractor shall be responsible to deploy the production applications in the public application stores. This will be the main method to deploy the application to end-users.	

6.2 Web service Testing & Deployment

Ref: IMS_TEST_04	Nature: Informative
Service Transition activities	
The contractor shall be aware of how testing and deployment activities (denominated service transition) are handled at EMSA. These are documented in Appendix G to these specifications.	
Ref: IMS_TEST_05	Nature: Mandatory
Corrections	
The contractor of IMS App project shall perform all the essential corrections to the software delivered taking into account the reports of the functional and non-functional site acceptance tests.	
Ref: IMS_TEST_06	Nature: Mandatory
Releases	
The contractor shall provide during the implementation one release. The release should abide to all testing requirements (functional and non-functional) as well the relevant requirements defined the Project Delivery Appendix linked with development and testing (Appendix D).	
Ref: IMS_TEST_07	Nature: Mandatory
Functional testing	
Functional tests shall be designed, implemented, executed and the results documented by the contractor within the context of factory acceptance tests prior to any delivery to ensure compliance with requirements here-in. Bidders shall describe in detail how they plan to execute Functional Tests and what tools will be used. The Contractor shall deliver a complete set of Test Documentation, including Test Strategy, Test Cases, Test Scripts, Test Data, and Test Results. The Contractor shall deliver a full and working test environment (including tools, configurations, test scripts, test data, execution instructions); This Test environment shall be deployed at EMSA and will be used during Site Acceptance and in any for future runs. Further technical details on the test environment will be provided at K.O.	
Ref: IMS_TEST_08	Nature: Mandatory
Functional testing – detailed test plan	
Upon delivery of a release, a detailed test plan shall be provided to be approved by EMSA. The test plan shall include complete description of the test and details on the necessary actions to perform it. The plan should also specify the category of each test. Categories include: <ul style="list-style-type: none"> ▪ Traceability between requirements and tests ▪ Regression test of previous approved functional elements ▪ Corrected bugs and defects from previous versions ▪ New functionalities ▪ Known bugs / errors in release (if any) 	

Ref: IMS_TEST_09	Nature: Mandatory
Non-functional testing	
<p>Non-functional tests shall be designed, implemented, executed and the results documented by the contractor within the context of factory acceptance tests prior to any delivery to ensure compliance with requirements here-in.</p> <p>Site acceptance non-functional tests shall be executed in the scope of the project by a test contractor chosen by EMSA as well as by EMSA staff.</p> <p>Non-functional tests shall include:</p> <ul style="list-style-type: none"> ▪ Load Tests ▪ Stress Tests, ▪ Availability/Resilience Tests ▪ Security Tests ▪ Traceability between requirements and tests <p>Bidders shall describe in detail how they plan to execute Non-Functional Tests and what tools will be used.</p> <p>The Contractor shall deliver a complete set of Test Documentation, including Test Strategy, Test Cases, Test Scripts, Test Data, and Test Results for the tests types specified above.</p> <p>The Contractor shall deliver a full and working test environment (including tools, configurations, test scripts, test data, execution instructions); This Test environment shall be deployed at EMSA and will be used during Site Acceptance and in any for future runs.</p>	
Ref: IMS_TEST_10	Nature: Mandatory
Go Live	
<p>The contractor shall be responsible for defining the Go Live strategy to be applied in PRODUCTION and PRE-PRODUCTION.</p> <p>Go Live strategy shall address the deployment, Migration (, all configurations and post-Production support for applicable IMS App related developments (WP1, WP2 or WP3). Bidders shall propose the Go Live strategy and Planning.</p> <p>The contractor shall adhere to the general EMSA requirements linked with project delivery and service requirements, presented in Appendix D and Appendix E, when it concerns to Go Live issues.</p>	
Ref: IMS_TEST_11	Nature: Mandatory
Documentation	
<p>The contractor is in charge to maintain and update he following documents during the lifetime of the project;;</p> <ul style="list-style-type: none"> ▪ Installation manual ▪ Operating and maintenance manual (O&M) ▪ Incident procedures <p>The contractor is also responsible to update any of the abovementioned documents on request by EMSA. Further details on documentation are provided in Appendix D and Appendix E on service and project delivery.</p>	
Ref: IMS_TEST_12	Nature: Mandatory
Integration	
<p>The contractor is responsible for the integration with EMSA's web services. The contractor shall also be asked to document any issues it encounters in terms of this integration, towards being communicated EMSA</p>	

6.3 Project delivery requirements

Ref: IMS_TEST_13	Nature: Informative
General Project delivery requirements	
<p>The contractor shall follow the requirements set forth in Appendix D Project delivery when concerns the main project phases:</p> <ul style="list-style-type: none"> ▪ Design ▪ Development and testing ▪ Deployment ▪ Go-Live 	
Ref: IMS_TEST_14	Nature: Mandatory
Quality checking	
<p>SonarQube is used for quality checking. EMSA uses a special Java Quality Gate based on “Sonar way with Findbugs” quality profile. The quality of a software deliverable shall follow the Appendix H - Initial Quality Gate for Java Projects.</p>	

7 Project planning requirements

Ref: IMS_PM_01	Nature: Mandatory
Project management tool – Team Forge	
<p>TeamForge will be the main tool for managing issues, sharing documents, and posting meeting minutes. EMSA will setup an account for the contractor.</p>	
Ref: IMS_PM_02	Nature: Mandatory
Agile methodology	
<p>The contractor shall follow an agile-based approach for implementing the project (WP1 and WP2), with multiple iterations of the solutions presented, to ensure that EMSA's staff can follow-up closely/review, comment and interact with the software and graphic design experts throughout all phases of project implementation.</p>	
Ref: IMS_PM_03	Nature: Mandatory
Meetings	
<p>There shall be at least 1 meeting every 10 days (phone conference or at EMSA's premises). In case the contractor or EMSA requires an additional meeting it has to be arranged within 2 working days. Regarding the minutes:</p> <ul style="list-style-type: none"> ▪ The contractor is in charge of the minutes of the meeting and provides them within 2 working days after the end of the meeting. ▪ The meeting minutes have to contain actions with deadline. ▪ The meeting minutes shall be uploaded to TeamForge and approved by EMSA. ▪ The contractor is responsible to upload to the TeamForge tracker any actions stemming from the meeting. 	
Ref: IMS_PM_04	Nature: Mandatory
Risk management	
<p>The bidder shall identify the main risks and mitigating actions to reduce overall risk of project failure</p>	
Ref: IMS_PM_05	Nature: Mandatory
Work breakdown structure, project activities and dependencies	

The bidder shall present:

- Work break down structure
- Gantt chart (per Work package)
- Risk assessment grid for each identified risk
- Person day effort per activity and allocated profiles for executing the work..

8 Summary of deliverables (Informative)

Ref: IMS_LIST_01	Nature: Informative
Overview	
This chapter summarizes the main deliverables expected from the contractor during the implementation of the project, linked with each of the work packages. Details on the content of each of the deliverables are provided in the above requirements or respective Appendices.	
Ref: IMS_LIST_02	Nature: Informative
Summary of main deliverables – WP1 and WP3 (mobile application side)	
<ul style="list-style-type: none"> ▪ Graphical and navigational elements including: <ul style="list-style-type: none"> ○ Wireframes produced, describing all the above mentioned elements linked with the 4 use cases ○ Graphical elements, organized per page, used in the implementation of the of the IMS App (including versions excluded during sprints) ▪ Source code for implemented developments including: <ul style="list-style-type: none"> ○ iOS versions (iPhone and iPad developments) ○ Android ○ Server side developments including cloud catalogue and storage ▪ Source code for automated tests ▪ Build scripts & manuals ▪ Installation manual ▪ Operating and maintenance manual (O&M) ▪ Incident procedures 	
Ref: IMS_LIST_03	Nature: Informative
Summary of main deliverables – WP2 and WP3 (server side components)	
<ul style="list-style-type: none"> ▪ After Kick-off <ul style="list-style-type: none"> ○ Functional design specifications ○ Technical design specifications ○ Draft software test approach ▪ For final release <ul style="list-style-type: none"> ○ Full system documentation (updated) ○ User documentation (updated) ○ Test documentation (including software test plan) ○ final version of the system to be deployed in all 3 environments ○ Source code of the developed solution 	
Ref: IMS_LIST_04	Nature: Informative
Summary of main deliverables – WP4	
<ul style="list-style-type: none"> ▪ Monthly Maintenance Reports and Statistics on maintenance activities ▪ Change Management Documents ▪ Updated versions of the system deliverables 	

9 Acronyms and definitions

Abbreviation	Definition
CISE	Common Information Sharing Environment
COTS	Commercial off the shelf
EO	Earth Observation
EU	European Union
FFI	Norwegian research institute
FMC	Fisheries Monitoring Centre
GUI / GI	Graphical (User) Interface
IdM	Oracle Identity Manager
IHS	IHS Fairplay
IVEF	Inter-VTS Exchange Format
LDAP	Lightweight Directory Access Protocol
LLI	Lloyds List Intelligence
MS	Member State
NPR proxy	Now renamed as SSN SI (Streaming interface)
OAM	Oracle Access Manager
OIM	Oracle Identity Manager
SAR	Satellite Aperture Radar / Search and Rescue
SHT	Single Hull Tanker
SSO	Single Sign On
SSO	Single Sign-On
UDDI	Universal Description Discovery and Integration
UMC	User Management Console
VDS	Vessel Detection System
WFS	Web Feature Service
WMS	Web Map Service
WUP	Web User Portal

Term	Definition
Application	<p>Application is a computer program or set of computer programs designed to help people perform a predefined set of activities. Applications could be implemented on custom-made code or commercial-off-the shelf software (COTS) such as Oracle database server, Oracle Identity management suite, Weblogic or Apache application servers, ArcGIS or Geoserver suites, Liferay portal server, Microsoft server, Active Directory, Open LDAP, etc.</p> <p>Maritime applications at EMSA include: CleanSeaNet, LRIT DC, LRIT Ship database, LRIT IDE, Thetis, STCW, IMDATE integrated services (MARSURV-1, MARSURV-3 and future VAS) and those included in the SSN system (currently EIS, STIRES, SSN Data warehouse).</p>
Interface	<p>The communication boundary between:</p> <ul style="list-style-type: none"> IT entities such as: IT systems, applications, software modules within an application, software or hardware devices, Users and IT systems (i.e. graphical interface)
Portlet	<p>Portlets are pluggable user interface software components that are managed and displayed in a web portal. Portlets produce fragments of markup code that are aggregated into a portal. Typically, following the desktop metaphor, a portal page is displayed as a collection of non-overlapping portlet windows, where each portlet window displays a portlet. Hence a portlet (or collection of portlets) resembles a web-based application that is hosted in a portal. Portlets are defined in JSR-000168 and JSR-000268 standards.</p>
Service	<p>(OASIS definition) Service is a mechanism to enable access to one or more capabilities, where the access is provided using a prescribed interface and is exercised consistent with constraints and policies as specified by the service description</p>
User	<p>A human being or an Authority accessing one or more EMSA applications using a web – based interface. The “Authority” could be understood as an account that allows a team of persons to</p>

Term	Definition
	access one or more applications.
User interface	User interface is everything designed into an IT system which includes one or more applications which a human being may interact with -- this includes, but is not restricted to: display screen, keyboard, mouse, light pen, desktop appearance, illuminated characters, help messages, and how an application program or a Web site invites interaction and responds to it.

10 Appendices to Annex A

Ref	Content
(A)	EMSA technical landscape
(B)	EMSA's Oracle API Gateway solution
(C)	IMS web service – architecture document
(D)	EMSA requirements for Project delivery
(E)	EMSA requirements for Service delivery and working procedures
(F)	EMSA Visual identity guidelines
(G)	EMSA Service Transition activities
(H)	EMSA Initial quality gate for JAVA projects