



Project co-financed by the European
Regional Development Fund

Project Acronym: PROTEUS

**Project title: Promoting security and safety by creating a MED cluster on
Maritime Surveillance**

Grant Agreement number: 1MED15_1.1_M12_148

D.3.3.2.

Identification of the market/ business opportunities

WP n°:	3
Task n°:	3.3
Author(s):	PPA
Contributors:	ALL PARTNERS, EXTERNAL EXPERTS
Type:	R = Report, Document
Dissemination level:	Public
Revision:	FINAL
Due Date:	31/07/2017
Date of submission:	04/01/2018

Contents

1.	Executive Summary	3
2.	Developments in Maritime Surveillance Industry – Overview of the market	4
3.	Graphic depiction of Business Opportunities Identification Methodology	10
4.	Technological Applications	11
5.	Business Opportunities Identification & Assessment	17
6.	Technology Exploitation - Commercialization Routes	26
7.	Conclusions	30
8.	References	31
9.	Annex 1 - Filled in Questionnaires	32
10.	Annex 2 – Matrix Table	50

1. Executive Summary

The current report has been implemented under the INTERREG MED 2014 -2020 project “PROteuS - Promoting security and safety by creating a MED cluster on Maritime Surveillance”, in the framework of the activity “3.3 Technology and Market Analysis” and namely the Deliverable “3.3.2 Identification of the market/ business opportunities”, by PPA SA, who is leading the specific activity.

The main aim of the D.3.3.2 is to study the market and business opportunities that are linked to Maritime Surveillance and the development of the respective industry in MED area, aiming at the enhancement of maritime safety and security.

Based on the findings of the previous deliverable, “D.3.3.1 Mapping of existing technologies and applications on integrated maritime surveillance per sector”, PPA SA proceeded to study and analyze the collection of MS technologies for all targeted sectors and categorize them to respective applications. Those applications were further evaluated by each partner for their own country, in each of the MS sectors applicable, in order to identify and assess the business opportunities currently available.

More than 140 technologies have been already mapped (the number could still increase as more technologies are added by partners) and analyzed, deriving from Spain, France, Greece, Cyprus, Israel, Italy, Malta, Norway, Sweden, Germany, UK and US. The technologies mapped, cover all 7 fields of Maritime Surveillance tackled by PROteuS: Maritime Safety & Security, Border Control, Fisheries Control, General Law Enforcement, Customs, Defence and Marine Environment Monitoring.

2. Developments in Maritime Surveillance Industry – Overview of the market

Maritime safety and security constitutes a rather crucial sector especially for countries that are geographically linked to sea. Maritime surveillance is a very important area, since it contributes in creating awareness of all the maritime incidents. The main characteristic of this sector is the fact that it supports horizontally many others, like border control, illegal immigration, fisheries, environmental protection and defence, analyzing and managing a massive amount of data coming from a series of different sources. The sector of Maritime Security and Safety requests sharing of important information and data that have important impact in various areas. Their management may be more efficient if the involved actors cooperate and exchange best practices and experiences. The ultimate scope of maritime surveillance is the unobstructed cooperation of the involved actors, the effective use of the relevant data that will result in the protection of maritime activities and environment.

The significance of this area is also highlighted by the fact that, during the last decades, it constitutes one of the buzzwords of international relationships, while it is the subject of various strategies launched by the EU, US and other countries either individually or not. Due to the importance of maritime protection and the rising challenges and risks that are linked to the activities linked to piracy, defence, environment etc., maritime surveillance industry and market is estimated to grow even more during the following 5 years. More specifically, the share of this market was \$16.71 billion in 2016 and according to the estimations of "Maritime Safety Market by Technology & Systems (Surveillance & Tracking, Detectors, GIS, Communication, SCADA, Screening & Scanning, Access Control, and Weather Monitoring), Service, Category, and Region - Global Forecast to 2021", published by Market sand Markets, the market will grow to \$23.67 Billion by 2021, at an estimated Compound Annual Growth Rate (CAGR) of 7.2%.

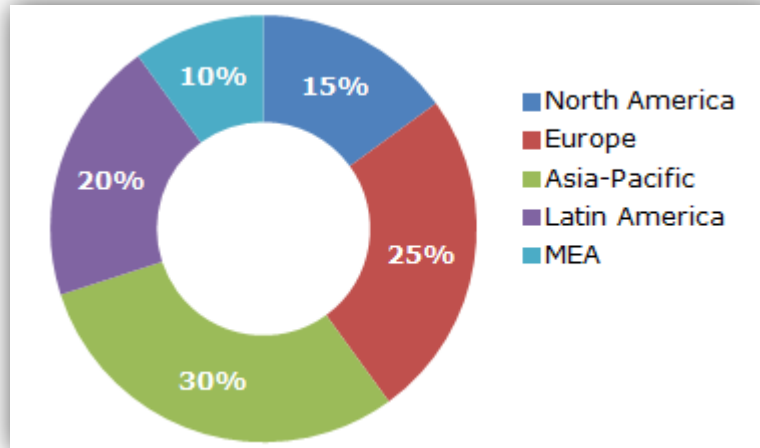


Diagram 1: Maritime Safety market share per Region
Source: marketsandmarkets.com

According to the aforementioned report, the increasing number of piracy incidents and marine terrorism are expected to give a further boost to the industry, as shipping and transport companies are forced to install more advanced safety and security systems to track their fleet and manage all possible risks. As a result, the surveillance and tracking segment of the industry is expected to have the most significant share of the market until 2021. In addition, another technology that will change maritime surveillance landscape, will be the detectors, as there is a series of advanced detection technologies already in the market, specializing in hazardous materials, biological, chemical, nuclear and explosive detectors, aiming at protecting maritime area from extreme threats.

The geographical area that is expected to have the largest share in the market during the period 2016-2021, is North America, because of the strong maritime industry that has been developed in the area. In the meanwhile, the industry in East Asia, South Asia, Southeast Asia, and Oceania, also known as APAC countries, is expected to grow the fastest, due to the expansion of port capacities, the rising importance of maritime security issues and the transformation of China, Japan, and India as well as other countries in Southeast Asia, into maritime transport hubs.

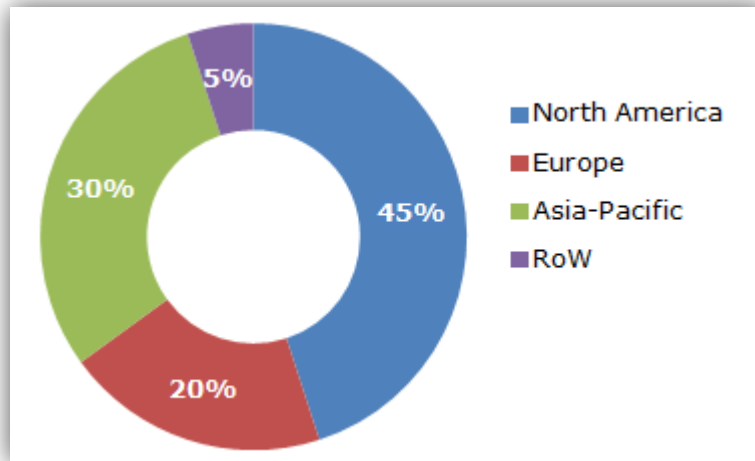


Diagram 2: Coastal Surveillance market share per Region
Source: marketsandmarkets.com

A significant part of maritime security and safety is coastal surveillance, which is estimated to grow from \$29.08 billion in 2016 to \$34.34 billion by 2021. The landscape of the sector consists of the developers, the distributors/ sellers and end users. For the latter, the most important one is the defence sector. According to Markets and Markets report (Maritime Safety Market by Technology & Systems (Surveillance & Tracking, Detectors, GIS, Communication, SCADA, Screening & Scanning, Access Control, and Weather Monitoring), Service, Category, and Region - Global Forecast to 2021), published in November 2016, the main players in coastal surveillance are Northrop Grumman Corporation in U.S., Thales Group in France, Terma A/S in Denmark, Kongsberg Gruppen in U.K., SAAB AB in Sweden, Elbit Systems Ltd. in Israel and Indra Sistemas S.A. and Spain. These companies produce advanced products and cutting edge services aiming at strengthening share in the sector of coastal surveillance.

Several countries around the world are in the phase of enhancing their defence and offence means through the launch of military patrol aircraft procurement. This trend leads to the growth of military aircraft market as the countries aim at boosting their maritime security. The global market is expected to grow at 4,71% CAGR during the period 2017-2021, while the key vendor players are Boeing, Airbus, SAAB, Lockheed Martin and others. The main characteristics of this market are the presence of strong well established global and regional vendors, the growing territorial and undersea threats and the frequent changes in policies and environmental regulations. These factors create a rather competitive and demanding landscape that pushes for the adoption of new technological advancements.

According to "Global Maritime Patrol Aircraft Market 2017-2021" report published in January 2017 by technavio, the major segments of the market belong to maritime patrol fixed-wing aircrafts that represent the largest market share and maritime patrol rotorcrafts. As far as geographical segmentation is concerned, U.S. accounts for the largest share and will continue to dominate till 2021. This trend is largely supported by the investments of the US Department of Defence, in research and development programs and the modernization and sustainment of their aircrafts.

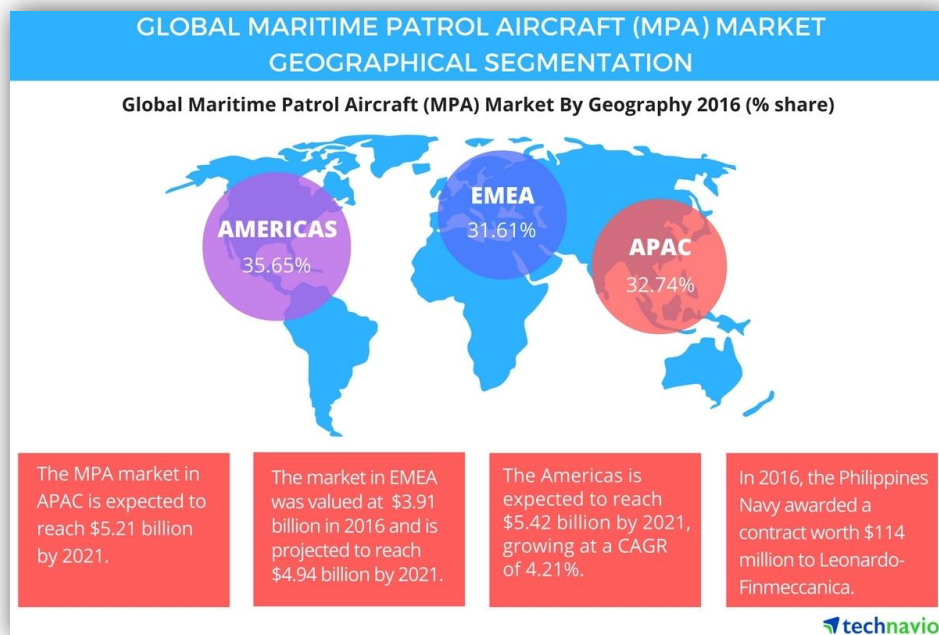


Table 1: Global Maritime Patrol Aircraft market geographical segmentation

A sector that provides major technological support to maritime surveillance segments is Space sector, due to the fact that over the past few years, space technology developments have created various options that could also be applied for the protection of the seas. It should be highlighted that the European Maritime Safety Agency (EMSA) is being supported in its daily tasks in the fields of oil pollution response and vessel tracking and monitoring by space technologies. The applied systems provide all necessary information to the main stakeholders, namely the Commission, EU counties and EU bodies, aiming at the safe and secure implementation of maritime activities through the efficient use of telecommunications, radars and satellites.

Some examples of space applications in maritime surveillance are listed below:

- Identification of oil pollution incidents, either accidental or illegal, and possible polluters, through Earth observation satellites in the framework of EMSA CleanSeaNet service. The respective authorities are informed via alerts within 30 minutes of the satellite passing.
- Search and rescue activities through the combination of tracking information coming from different systems and sending them to the responsible authorities in one single interface. This is very crucial as the rescue centres are aware of both the vessels in risk and those able to provide help.

In addition, EMSA supports European fisheries control agency (EFCA), Frontex and EUNAVFOR in various fields, like fisheries monitoring, border control and anti-piracy. More specifically, EMSA assists Frontex in facing illegal immigration and cross-border crime with the support of real time vessel position information and the monitoring of the vessels' behaviour. Moreover EFCA receives real time operational picture and relevant correlating position reports of EU fisheries, to facilitate the effective control by EU members. Finally, EMSA supports the anti-piracy activities of EUNAVFOR with the assist of a custom-made web user interface that depicts a wide range of data coming from the real time position of vessels in the control area.

EMSA uses cutting edge space technology to provide credible and real time data to key stakeholders, assuring safety and security in EU seas. During the next decades and having as stable base the European programmes Copernicus and Galileo, EMSA will support even more the operations of EU Authorities, adding value through the incorporation of further technological improvements in its daily activities.

The multiple uses of the maritime landscape are expected to create further challenges and risks for maritime security and safety in the future. This trend is the major driver of technological improvements in the segments of maritime surveillance. The respective industry will experience significant developments in the forthcoming years, aiming at covering the constantly increasing needs of the sector and assuring the safety of maritime transports.

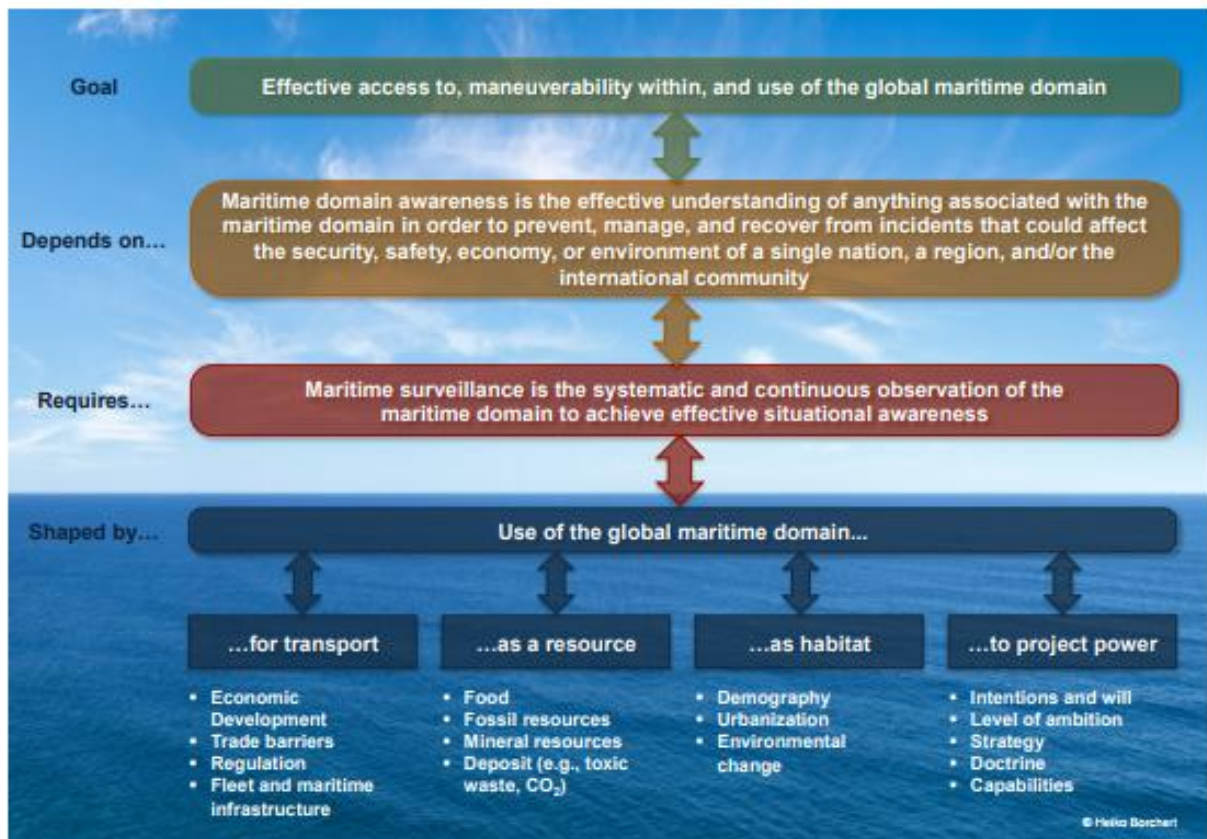
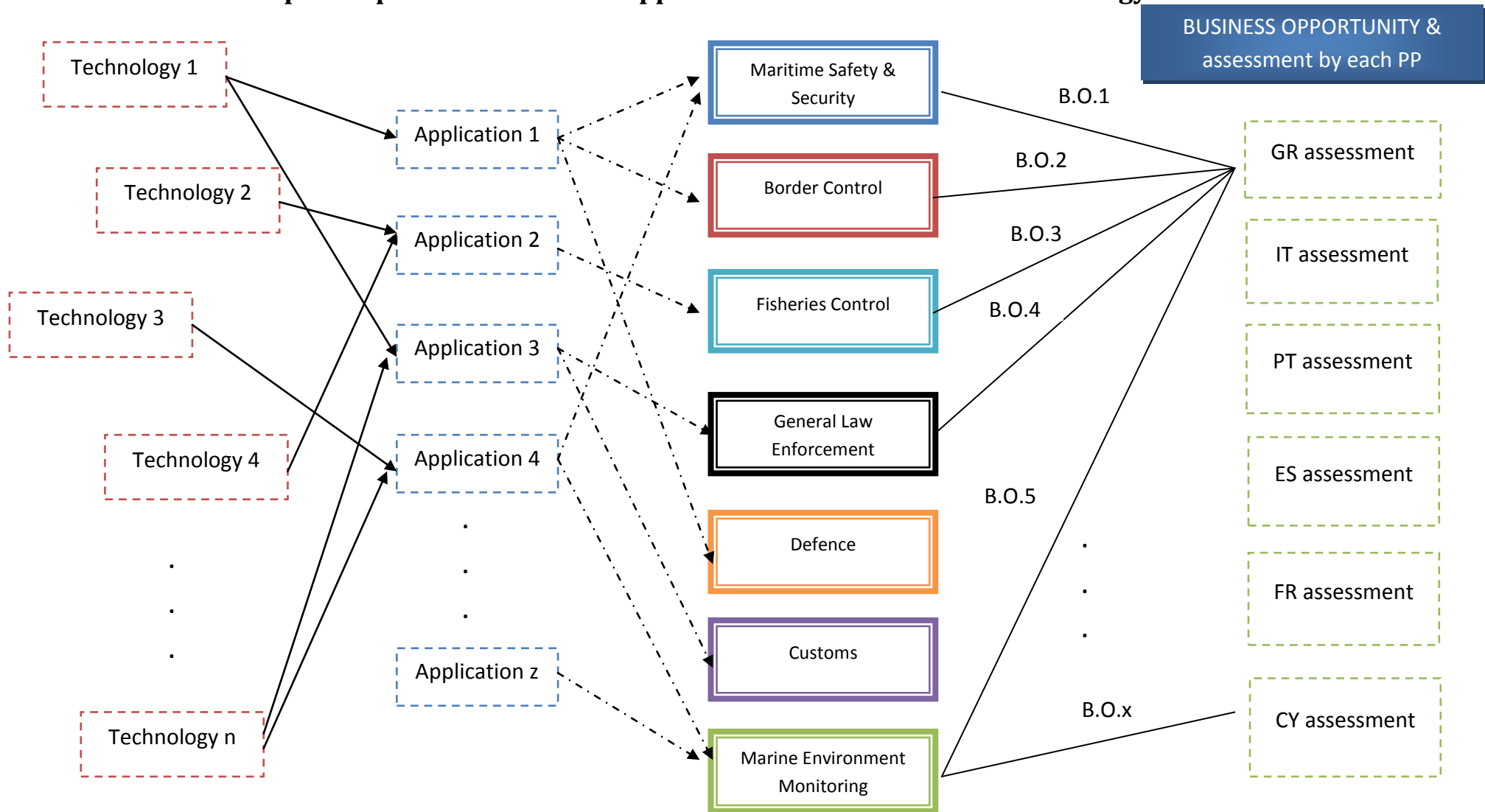


Figure 1: Analytical Framework

Based in parts on definitions in *National Plan to Achieve Maritime Domain Awareness for the National Strategy for Maritime Security* (Washington, DC: U.S. Government, 2005), p. 1; *Maritime Surveillance in Support of CSDP. The Wise Pen Team Final Report to EDA Steering Group* (Brussels: European Defense Agency, 2010), p. 47.

3. Graphic depiction of Business Opportunities Identification Methodology



4. Technological Applications

1. Image detection & processing for on-board surveillance

Image processing is processing of images using mathematical operations by using any form of signal processing for which the input is an image, a series of images or a video, such as a photograph or video frame; the output of image processing may be either an image or a set of characteristics or parameters related to the image. Technologies under this application are used on-board of vessels for on-site surveillance.

Indicative examples of technologies: T001, T023, T024 etc.

MS sectors applicable: Maritime Safety & Security

2. Aerial surveillance

Aerial surveillance is the gathering of surveillance, usually visual imagery or video, from an airborne vehicle—such as an unmanned aerial vehicle, helicopter, or spy plane. Military surveillance aircraft use a range of sensors (e.g. radar) to monitor the battlefield. Technologies under this application are mainly UAVs, Drones and RPAs.

Indicative examples of technologies: T018, T029, T031, T056, T137 etc.

MS sectors applicable: Border Control, Fisheries Control, Defence, Maritime Safety & Security, Customs, Marine Environment Monitoring, General Law Enforcement

3. Video processing for remote surveillance

Video processing is a particular case of signal processing, which often employs video filters and where the input and output signals are video files or video streams. Technologies under this application include mainly cameras and video surveillance systems.

Indicative examples of technologies: T013, T019, T023, T030, T055 etc.

MS sectors applicable: Border Control, Fisheries Control, Defence, Maritime Safety & Security, Customs, General Law Enforcement

4. Data processing from remote sensors

Data processing is, generally, "the collection and manipulation of items of data to produce meaningful information." In this sense it can be considered a subset of information processing, "the change (processing) of information in any manner detectable by an observer." Remote sensing is used in numerous fields, including geography, land surveying and most Earth Science disciplines; it also has military, intelligence, commercial, economic, planning, and humanitarian applications. Technologies under this application include mainly integrated systems that are receiving data from remote sensors and conduct data analysis and data processing procedures to allow real-time accurate information.

Indicative examples of technologies: T005, T035, T058, T061, T139 etc.

MS sectors applicable: Maritime Safety & Security

5. Alert Management Systems

An Alert Management System (AMS) is a real time system which maintains profiles about individuals, threats, or other entities and in real time processes events and returns alerts about profiles and their risks. An emergency notification system is a method of facilitating the one-way dissemination or broadcast of messages to one or many groups of people, alerting them to a pending or existing emergency. Technologies under this application include RPAs, Drones and innovative alert systems.

Indicative examples of technologies: T001, T031, T050 etc.

MS sectors applicable: Border Control, Fisheries Control, Defence, Maritime Safety & Security, Customs, Marine Environment Monitoring, General Law Enforcement

6. Radar Vessel Tracking Systems

A radar tracker is a component of a radar system, or an associated command and control (C2) system that associates consecutive radar observations of the same target into tracks. It is particularly useful when the radar system is reporting data from several different targets or when it is necessary to combine the data from several different radars or other sensors. Technologies under this application include AIS, VTMS, VTS etc.

Indicative examples of technologies: T006, T007, T008, T009, T010, T015, T032, T038, T052 T059, T060, T142 etc.

MS sectors applicable: Fisheries Control, Maritime Safety & Security, Marine Environment Monitoring, General Law Enforcement, Customs, Defence, Border Control.

7. Signal processing recorders for underwater monitoring

Signal processing concerns the analysis, synthesis, and modification of signals, which are broadly defined as functions conveying "information about the behaviour or attributes of some phenomenon", such as sound, images, and biological measurements. Technologies under this application include mainly sonars, recorders and AUVs (autonomous underwater vehicles) that are specifically designed for underwater surveillance.

Indicative examples of technologies: T012, T014, T017, T043, T044, T045, T047 etc.

MS sectors applicable: Defence, Maritime Safety & Security, Marine Environment, Monitoring.

8. Image detection & processing for fixed installations

Image processing is processing of images using mathematical operations by using any form of signal processing for which the input is an image, a series of images or a video, such as a photograph or video frame; the output of image processing may be either an image or a set of characteristics or parameters related to the image. Technologies under this application include digital surveillance systems and cameras that are installed on fixed points (ie vessels, ports etc.)

Indicative examples of technologies: T003, T004, T013, T016,

MS sectors applicable: Border Control, Fisheries Control, Defence, Maritime Safety & Security, Customs, General Law Enforcement

9. Data transmission sensors for measurements at sea

Data transmission, digital transmission or digital communications is the transfer of data (a digital bit stream or a digitized analog signal) over a point-to-point or point-to-multipoint communication channel. Examples of such channels are copper wires, optical fibers,

wireless communication channels, storage media and computer buses. The data are represented as an electromagnetic signal, such as an electrical voltage, radiowave, microwave, or infrared signal. Analog or analogue transmission is a transmission method of conveying voice, data, image, signal or video information using a continuous signal which varies in amplitude, phase, or some other property in proportion to that of a variable. Technologies under this application mainly include data boys.

Indicative examples of technologies: T020, T048, T049, T143 etc.

MS sectors applicable: Fisheries control, Maritime Safety & Security, Marine Environment Monitoring, Defence.

10. MS Topics Training

Training is teaching, or developing in oneself or others, any skills and knowledge that relate to specific useful competencies. Training has specific goals of improving one's capability, capacity, productivity and performance. Training for MS includes Cyber Defence, Systems Maintenance, Avionics, Computer Apps, Maritime Security, Antipiracy.

Indicative examples of technologies: T022, T025, T027, T028, T037, T138, T141 etc.

MS sectors applicable: Defence, Maritime Safety & Security, General Law Enforcement

11. Satellite signal detection

Signal detection theory is a statistical technique designed to locate a signal against a background of noise. Technologies under this application include satellite antennas and cloud-based systems using satellite data.

Indicative examples of technologies: T026, T034, T054, T058, T140 etc.

MS sectors applicable: Border Control, Defence, Maritime Safety & Security, Fisheries Control, Marine Environment Monitoring

12. Wireless tactical communication equipment for vessels

Wireless communication, or sometimes simply wireless, is the transfer of information or power between two or more points that are not connected by an electrical conductor. The

most common wireless technologies use radio waves. Wireless operations permit services, such as long-range communications, that are impossible or impractical to implement with the use of wires. Technologies under this application include IP based tactical communications networks.

Indicative examples of technologies: T033 etc.

MS sectors applicable: Defence, Maritime Safety and Security

13. Signal processing for remote monitoring and analysis of ship functions in real time

Technologies under this application include systems based on innovative hardware and sophisticated software with enhanced analytics that allow the complete remote monitoring and analysis of critical ship's functions in real time.

Indicative examples of technologies: T035 etc.

MS sectors applicable: Maritime Safety & Security

14. Static frequency converters to power supply vessel equipment

A frequency changer or frequency converter is an electronic or electromechanical device that converts alternating current (AC) of one frequency to alternating current of another frequency. The device may also change the voltage, but if it does, that is incidental to its principal purpose. Technologies under this application include converters that feed the optimum electrical power system to vessel's equipment.

Indicative examples of technologies: T039

MS sectors applicable: Maritime Safety & Security

15. Test equipment for naval systems

Technologies under this application include equipment to test underwater units and test equipment for synchro-based servo-systems.

Indicative examples of technologies: T041, T042

MS sectors applicable: Defence

16. Data collection and processing for underwater parameters

Technologies under this application include systems and AUVs that carry sensors to collect and analyze data for underwater parameters.

Indicative examples of technologies: T043, T047

MS sectors applicable: Defence, Marine Environment Monitoring

17. Underwater robotic manipulator for supporting vehicles

Technologies under this application includes an underwater robotic manipulator, designed by adopting a modular approach. Its composing elements, the basic modules, are made of Ergal, a special aluminium alloy exhibiting favorable properties in terms of high fatigue strength, light weight and easy machinability.

Indicative examples of technologies: T044

MS sectors applicable: Defence, Marine Environment Monitoring

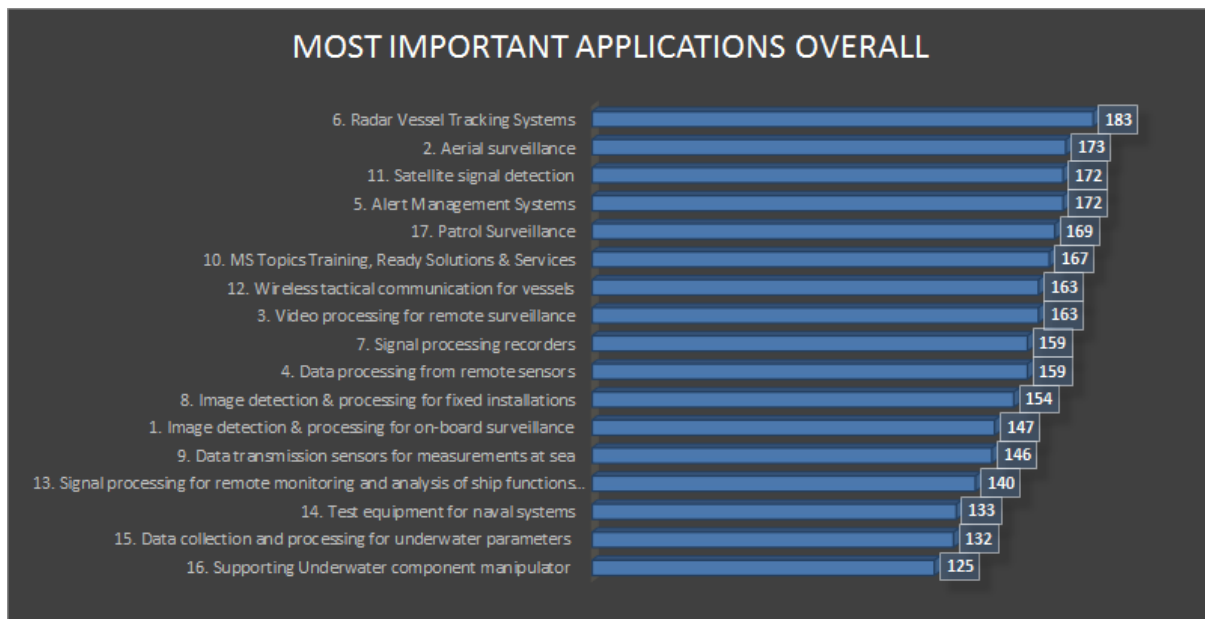
5. Business Opportunities Identification & Assessment

Based on the methodological approach of the deliverable for the identification and assessment of the MS Business/market opportunities, as depicted on the section 3 of the current report, the following questionnaire have been designed in order to enable partners to assess the opportunities for their own countries according to known market trends.

Each application identified (total 17 applications) is measured for its importance for the country for each of the 7 MS subsectors that PROteuS is studying. Namely border control, general law enforcement, defence, customs, maritime safety & security, fisheries management and marine environment monitoring.

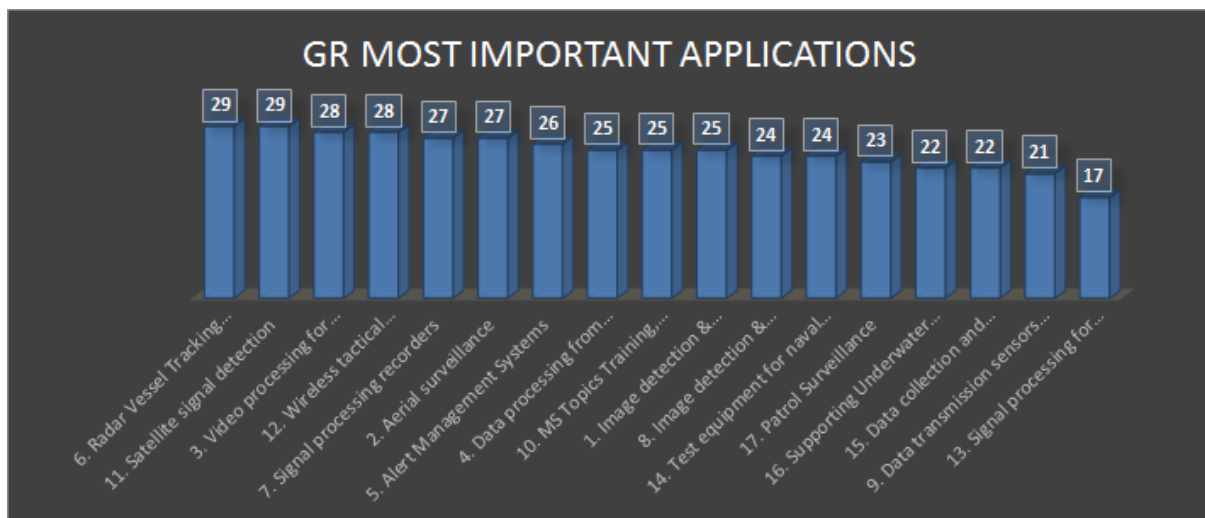
Each partner was responsible to rank each sector for every application on a scale of 1 to 5. 1 representing non importance of the respective application for this sector in that country and 5 representing high importance. The partners completed their questionnaires and their answers are analyzed in order to extract the most important applications & sectors for each country and thus on project level, in the present section of the report. The questionnaires were distributed to the partners that are responsible to host a local node meaning: CCIAA DL, CCSEV, UAIG, TVT PMM, MARINEM (additional node approved) and, of course, PPA SA, which filled in the questionnaire for Greece and integrated and analyzed the answers for the whole partnership, as task leader.

MOST IMPORTANT APPLICATIONS OVERALL



Across all participating countries, we can identify a strong need and importance for a. Radar Vessel Tracking Systems, b. Aerial Surveillance, c. Satellite signal detection, d. Alert Management Systems and e. Patrol Surveillance.

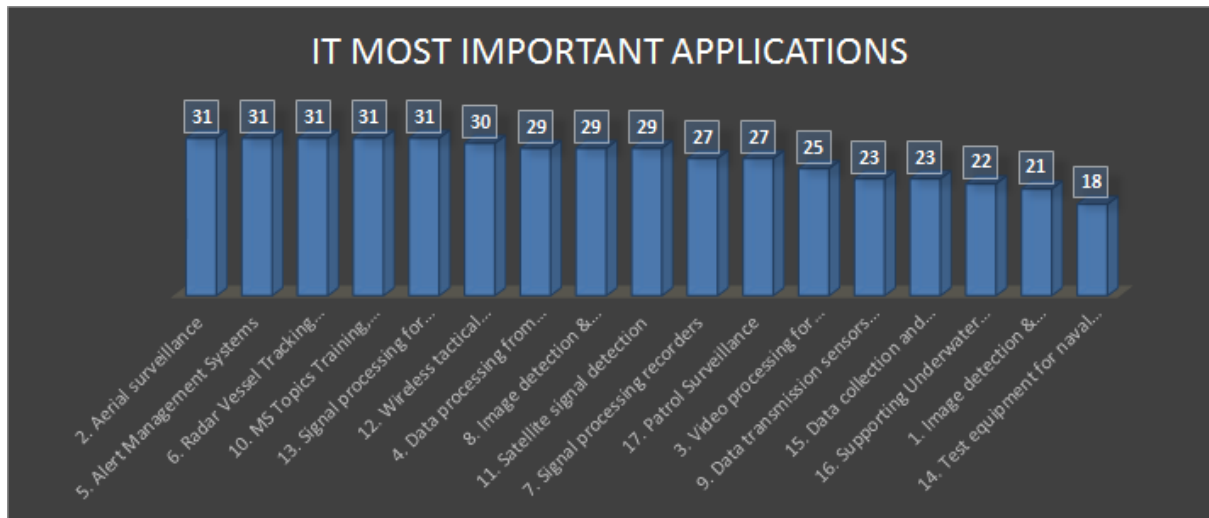
GREECE MOST IMPORTANT APPLICATIONS



We can observe that the top (the last two are tied, so both are included in the indicative TOP 5) application groups in Greece are:

- a) Radar Vessel Tracking Systems
- b) Satellite signal detection
- c) Video processing for remote surveillance
- d) Wireless tactical communication for vessels
- e) Signal processing recorders
- f) Aerial surveillance

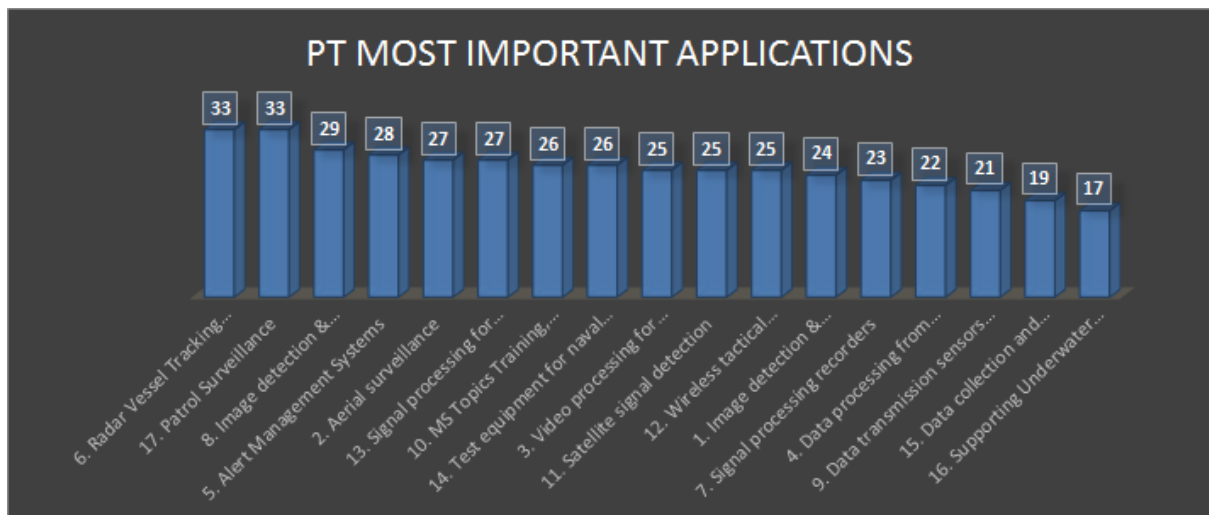
ITALY MOST IMPORTANT APPLICATIONS



We can observe that the top 5 application groups for Italy are:

- Aerial surveillance
- Alert Management Systems
- Radar Vessel Tracking Systems
- MS Topics Training, Ready Solutions & Services
- Signal processing for remote monitoring and analysis of ship functions in real time

PORTUGAL MOST IMPORTANT APPLICATIONS

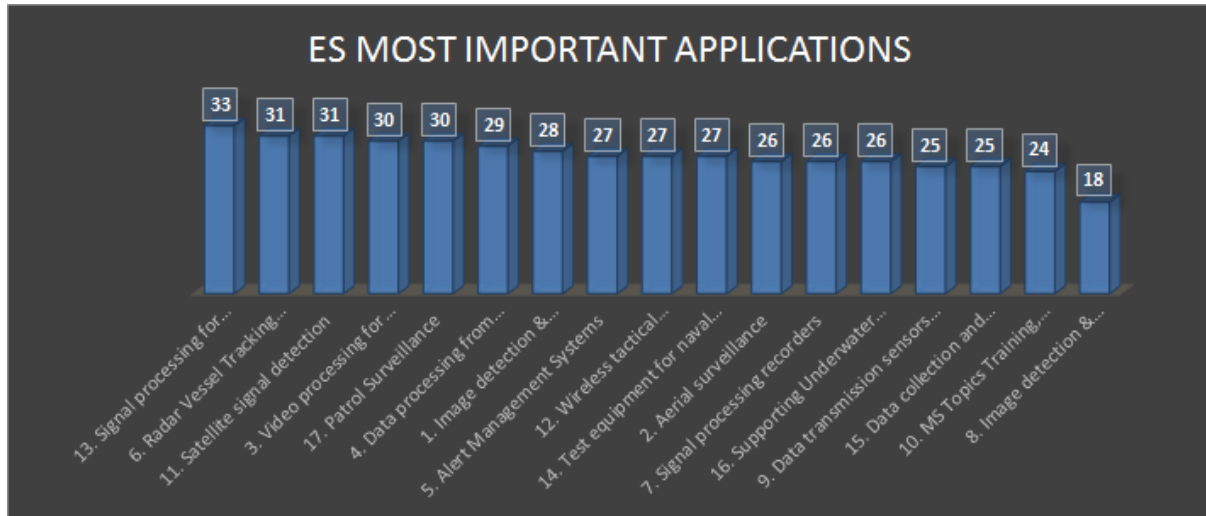


We can observe that the top (the last two are tied, so both are included in the indicative TOP 5) application groups in Portugal are:

- Radar Vessel Tracking Systems
- Patrol Surveillance
- Image detection & processing for fixed installations
- Alert Management Systems

- e) Aerial surveillance
- f) Signal processing for remote monitoring and analysis of ship functions in real time

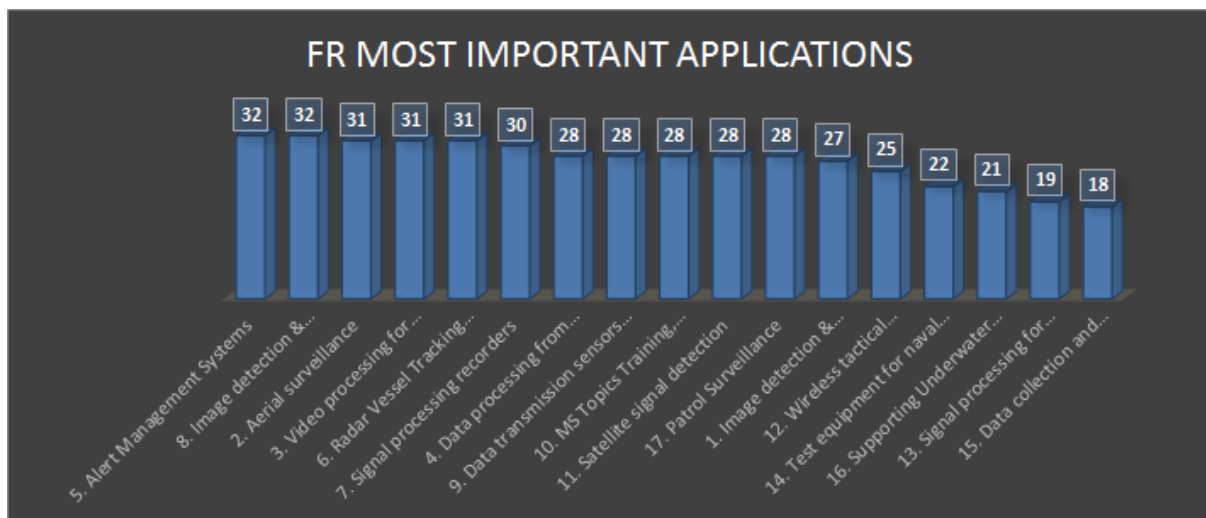
SPAIN MOST IMPORTANT APPLICATIONS



We can observe that the top 5 application groups for Spain are:

- a) Signal processing for remote monitoring and analysis of ship functions in real time
- b) Radar Vessel Tracking Systems
- c) Satellite signal detection
- d) Video processing for remote surveillance
- e) Patrol Surveillance

FRANCE MOST IMPORTANT APPLICATIONS

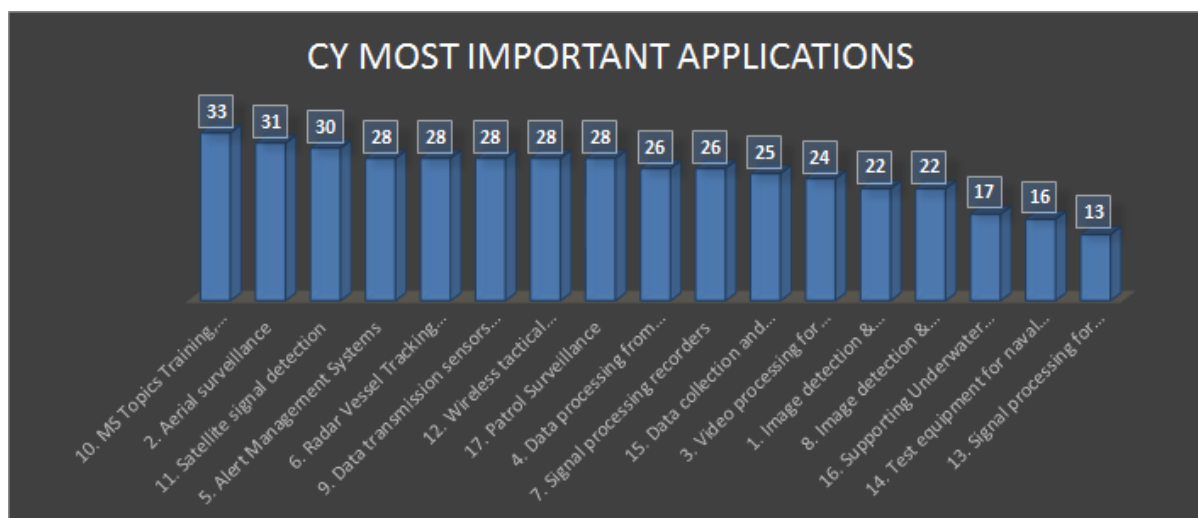


We can observe that the top 5 application groups for France are:

- a) Alert Management Systems
- b) Image detection & processing for fixed installations
- c) Aerial surveillance
- d) Video processing for remote surveillance

e) Radar Vessel Tracking Systems

CYPRUS MOST IMPORTANT APPLICATIONS



We can observe that the top (the last five are tied, so all are included in the indicative TOP 5) application groups in Portugal are:

- MS Topics Training, Ready Solutions & Services
- Aerial surveillance
- Satellite signal detection
- Alert Management Systems
- Radar Vessel Tracking Systems
- Data transmission sensors for measurements at sea
- Wireless tactical communication for vessels
- Patrol Surveillance

APPLICATION 1 RATINGS PER MS SECTOR AND COUNTRY

APPLICATION	IN	GR	IT	PT	ES	FR	CY
1. Image detection & processing for on-board surveillance	Border Control	5	2	4	5	4	5
	General Law Enforcement	4	3	3	3	3	4
	Defence	3	2	3	5	5	3
	Customs	3	1	4	4	4	1
	Maritime Safety & Security	5	5	4	4	4	5
	Fisheries Management	2	4	3	3	3	2
	Marine Environment Monitoring	3	4	3	4	4	2

APPLICATION 2 RATINGS PER MS SECTOR AND COUNTRY

APPLICATION	IN	GR	IT	PT	ES	FR	CY
2. Aerial surveillance	Border Control	5	5	5	5	4	5
	General Law Enforcement	4	3	4	3	3	5
	Defence	4	5	5	4	5	5
	Customs	3	3	4	4	5	4
	Maritime Safety & Security	5	5	4	3	5	5
	Fisheries Management	2	5	3	3	4	2
	Marine Environment Monitoring	4	5	2	4	5	5

APPLICATION 3 RATINGS PER MS SECTOR AND COUNTRY

APPLICATION	IN	GR	IT	PT	ES	FR	CY
3. Video processing for remote surveillance	Border Control	5	4	4	4	5	5
	General Law Enforcement	4	2	4	3	4	3
	Defence	4	4	4	5	5	3
	Customs	3	3	4	5	4	2
	Maritime Safety & Security	5	5	4	5	5	5
	Fisheries Management	3	3	3	3	4	1
	Marine Environment Monitoring	4	4	2	5	4	5

APPLICATION 4 RATINGS PER MS SECTOR AND COUNTRY

APPLICATION	IN	GR	IT	PT	ES	FR	CY
4. Data processing from remote sensors	Border Control	4	5	2	5	4	4
	General Law Enforcement	3	2	2	3	3	4
	Defence	4	5	3	3	5	4
	Customs	3	3	3	4	4	2
	Maritime Safety & Security	4	5	4	5	4	4
	Fisheries Management	3	4	4	4	4	3
	Marine Environment Monitoring	4	5	4	5	4	5

APPLICATION 5 RATINGS PER MS SECTOR AND COUNTRY

APPLICATION	IN	GR	IT	PT	ES	FR	CY
5. Alert Management Systems	Border Control	4	5	4	4	5	4
	General Law Enforcement	4	3	4	3	4	4
	Defence	4	5	4	4	5	4
	Customs	3	4	4	4	5	2
	Maritime Safety & Security	5	5	4	5	5	5
	Fisheries Management	3	4	4	3	4	4
	Marine Environment Monitoring	3	5	4	4	4	5

APPLICATION 6 RATINGS PER MS SECTOR AND COUNTRY

APPLICATION	IN	GR	IT	PT	ES	FR	CY
6. Radar Vessel Tracking Systems	Border Control	5	5	5	5	5	5
	General Law Enforcement	5	4	5	2	4	4
	Defence	5	5	5	5	5	4
	Customs	3	4	5	5	5	4
	Maritime Safety & Security	5	5	5	5	5	5
	Fisheries Management	3	4	4	4	3	4
	Marine Environment Monitoring	3	4	4	5	4	2

APPLICATION 7 RATINGS PER MS SECTOR AND COUNTRY

APPLICATION	IN	GR	IT	PT	ES	FR	CY
7. Signal processing recorders	Border Control	4	5	3	4	5	4
	General Law Enforcement	4	3	3	5	3	4
	Defence	4	5	4	3	5	4
	Customs	3	2	4	4	5	2
	Maritime Safety & Security	5	5	3	4	5	5
	Fisheries Management	2	2	3	2	3	2
	Marine Environment Monitoring	5	5	3	4	4	5

APPLICATION 8 RATINGS PER MS SECTOR AND COUNTRY

APPLICATION	IN	GR	IT	PT	ES	FR	CY
8. Image detection & processing for fixed installations	Border Control	5	5	5	3	5	5
	General Law Enforcement	5	4	5	4	4	4
	Defence	5	5	5	2	5	3
	Customs	2	3	4	3	5	1
	Maritime Safety & Security	3	5	4	2	5	5
	Fisheries Management	2	4	3	2	4	2
	Marine Environment Monitoring	2	3	3	2	4	2

APPLICATION 9 RATINGS PER MS SECTOR AND COUNTRY

APPLICATION	IN	GR	IT	PT	ES	FR	CY
9. Data transmission sensors for measurements at sea	Border Control	2	2	3	2	3	4
	General Law Enforcement	2	3	3	2	5	4
	Defence	2	2	3	2	5	4
	Customs	1	1	2	4	3	1
	Maritime Safety & Security	4	5	3	5	4	5
	Fisheries Management	5	5	3	5	4	5
	Marine Environment Monitoring	5	5	4	5	4	5

APPLICATION 10 RATINGS PER MS SECTOR AND COUNTRY

APPLICATION	IN	GR	IT	PT	ES	FR	CY
10. MS Topics Training, Ready Solutions & Services	Border Control	4	4	4	2	4	5
	General Law Enforcement	4	4	4	2	3	5
	Defence	4	5	4	4	5	5
	Customs	3	4	4	4	5	3
	Maritime Safety & Security	4	5	3	4	5	5
	Fisheries Management	3	5	3	3	3	5
	Marine Environment Monitoring	3	4	4	5	3	5

APPLICATION 11 RATINGS PER MS SECTOR AND COUNTRY

APPLICATION	IN	GR	IT	PT	ES	FR	CY
11. Satellite signal detection	Border Control	5	4	3	5	4	5
	General Law Enforcement	5	3	3	2	4	5
	Defence	5	4	4	5	5	4
	Customs	4	4	3	5	4	3
	Maritime Safety & Security	5	5	4	5	5	5
	Fisheries Management	2	4	4	4	2	4
	Marine Environment Monitoring	3	5	4	5	4	4

APPLICATION 12 RATINGS PER MS SECTOR AND COUNTRY

APPLICATION	IN	GR	IT	PT	ES	FR	CY
12. Wireless tactical communication for vessels	Border Control	5	5	4	5	4	4
	General Law Enforcement	5	4	4	2	2	5
	Defence	5	5	4	5	5	5
	Customs	4	4	4	5	4	3
	Maritime Safety & Security	5	5	3	4	5	5
	Fisheries Management	2	3	3	2	2	2
	Marine Environment Monitoring	2	4	3	4	3	4

APPLICATION 13 RATINGS PER MS SECTOR AND COUNTRY

APPLICATION	IN	GR	IT	PT	ES	FR	CY
13. Signal processing for remote monitoring and analysis of ship functions in real time	Border Control	2	5	4	5	3	2
	General Law Enforcement	2	5	4	4	1	2
	Defence	2	5	4	5	5	2
	Customs	2	3	4	5	3	1
	Maritime Safety & Security	5	5	4	5	3	2
	Fisheries Management	2	4	4	4	2	2
	Marine Environment Monitoring	2	4	3	5	2	2

APPLICATION 14 RATINGS PER MS SECTOR AND COUNTRY

APPLICATION	IN	GR	IT	PT	ES	FR	CY
14. Test equipment for naval systems	Border Control	4	4	3	4	3	4
	General Law Enforcement	3	2	3	3	3	1
	Defence	4	5	4	4	5	4
	Customs	3	1	3	4	3	1
	Maritime Safety & Security	4	4	4	4	4	4
	Fisheries Management	3	1	5	4	2	1
	Marine Environment Monitoring	3	1	4	4	2	1

APPLICATION 15 RATINGS PER MS SECTOR AND COUNTRY

APPLICATION	IN	GR	IT	PT	ES	FR	CY
15. Data collection and processing for underwater parameters	Border Control	4	4	2	2	1	4
	General Law Enforcement	3	4	2	4	3	4
	Defence	4	4	3	5	5	4
	Customs	2	1	2	2	1	2
	Maritime Safety & Security	4	4	2	5	2	4
	Fisheries Management	2	2	4	3	3	2
	Marine Environment Monitoring	3	4	4	4	3	5

APPLICATION 16 RATINGS PER MS SECTOR AND COUNTRY

APPLICATION	IN	GR	IT	PT	ES	FR	CY
16. Supporting Underwater component manipulator	Border Control	4	2	2	3	1	2
	General Law Enforcement	3	4	2	3	1	2
	Defence	4	4	3	5	5	4
	Customs	2	1	2	3	2	2
	Maritime Safety & Security	4	4	2	5	4	4
	Fisheries Management	2	3	3	3	4	1
	Marine Environment Monitoring	3	4	3	4	4	2

APPLICATION 17 RATINGS PER MS SECTOR AND COUNTRY

APPLICATION	IN	GR	IT	PT	ES	FR	CY
17. Patrol Surveillance	Border Control	4	4	5	5	5	4
	General Law Enforcement	3	4	5	4	4	4
	Defence	3	4	5	5	5	4
	Customs	4	3	5	5	5	4
	Maritime Safety & Security	4	5	5	3	5	4
	Fisheries Management	2	3	5	3	2	4
	Marine Environment Monitoring	3	4	3	5	2	4

For **BORDER CONTROL**, the most important applications are:

- Radar Vessel Tracking Systems
- Aerial surveillance
- Image detection & processing for fixed installations

For **GENERAL LAW ENFORCEMENT**, the most important applications are:

- Image detection & processing for fixed installations
- Radar Vessel Tracking Systems
- Patrol Surveillance

For **DEFENCE**, the most important applications are:

- Wireless tactical communication for vessels
- Radar Vessel Tracking Systems
- Aerial surveillance

For **CUSTOMS**, the most important applications are:

- Radar Vessel Tracking Systems
- Patrol Surveillance
- Wireless tactical communication for vessels

For **MARITIME SAFETY & SECURITY**, the most important applications are:

- Radar Vessel Tracking Systems
- Video processing for remote surveillance
- Alert Management Systems
- Satellite signal detection

For **FISHERIES MANAGEMENT**, the most important applications are:

- Data transmission sensors for measurements at sea
- Data processing from remote sensors
- Alert Management Systems
- Radar Vessel Tracking Systems
- MS Topics Training, Ready Solutions & Services

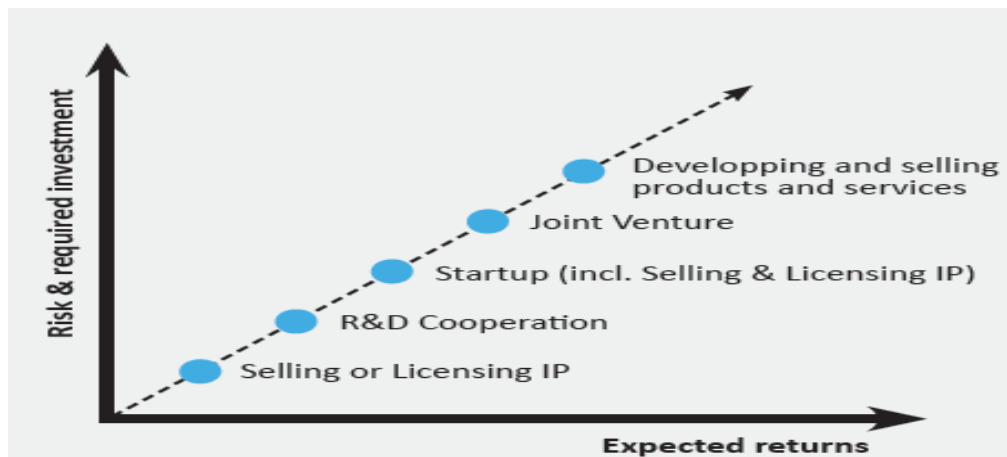
For **MARINE ENVIRONMENT MONITORING**, the most important applications are:

- Data transmission sensors for measurements at sea
- Data processing from remote sensors
- Signal processing recorders

6. Technology Exploitation - Commercialization Routes

Below are summarized several important things to take into account when deciding on a commercialization route for a technology:

1. The involvement and the commitment needed in terms of time, personal resources, passion, etc.,
2. The risk tolerance,
3. the investments needed and the organisation's ability to provide it or otherwise obtain it and,
4. the potential earnings in monetary form or otherwise for both the innovator and the organisation.



Experience indicates the need to assess the different routes in detail and not commit to any of them without a careful assessment of all available options. For example, some issues to consider are:

- How much effort are you willing to contribute to commercialization activities?
- What are your competences and capacities to become engaged in commercialisation activities?
- What internal and external support is available to you?
- How much risk are you willing to take?
- At what stage and what type of technology do you seek to commercialise?
- How much additional R&D is needed in terms of resources, capital, before being market ready?

Possible Types of Partnership for commercialization:

- Acquisition agreement
- License agreement
- Manufacturing agreement (transfer of knowledge, new way to use, change in partner's currently used technology, absolutely novel process)
- Commercial agreement with technical assistance (joint further development, testing of new applications, adaptation to specific needs)
- Outsourcing agreement
- Distribution services agreement
- Franchise
- Subcontracting
- Joint Venture

Indicative Commercialization Routes:

 Start-up/spin-off

A popular commercialization route is to create a start-up company. The inventor forms a team and establishes a company in order to bring the results of their research to market.

Pros

- The financial rewards can be very high
- More active role throughout the commercialization route

Cons

- High risk (very few start-ups succeed)
- The researched may not have the competences needed for becoming an entrepreneur

 Commercial services

Another potential commercialization route is to develop and to market the product/service within the research organization, by providing tech services or by producing small batches of products. This route may not very common, because it differs significantly from the goals and the purpose of a public research institution and there are many financial risks especially

if the development requires funding from third parties, but it is recommended in some cases where the target market is small and the creation of a spin-off is not a viable option.

Pros

- Close to the research activities
- May be the best way to serve a market

Cons

- Includes important financial and business risks
 - Deviates from the purpose of a research institution
 - Potential legal restraints in public organizations
 - Dependent of lab equipment and facilities of the research organization
-

R&D cooperation

Establishment of an R&D cooperation between the research institution and an industrial partner/commercialization partner. The Research institution licenses out the IP to the commercialization partner who is then responsible for bringing the innovation to the market.

Pros

- The research institution focuses on continuing the R&D, which is the area where they have significant competences and know-how.
- Financial earning for the R&D institutions early in the commercialization process.
- Less risk

Cons

- Market oriented R&D/Focus on meeting product development milestones and not on scientific excellence.
 - May be a less profitable route on the long run
-

Selling or Licensing IP

The research institution sales of licenses the Intellectual Property Rights (IPRs) related to the technology. This is a recommended option when the IP is strongly protected with patents. The payments schemes may include a fixed upfront fee or a success fee or a combination of both and it may be exclusive or non-exclusive. This is a good option when there are already established companies in the market and significant resources are needed in order to compete with them, when the market is too small or when the inventor does not have the competences and the resources to commercialize the research results.

Pros

- Less risk
- Increased chances of reaching the market
- Takes advantage of the know-how of the company that licenses the technology
- Multiple revenue streams may be available by giving out more than one license

Cons

- May give low financial returns
- Needs deep knowledge of the market and the risks in order to ask for the right price
- Needs good negotiating skills

7. Conclusions

Maritime surveillance is a very important area, since it contributes in creating awareness of all the maritime incidents. The significance of this area is also highlighted by the fact that, during the last decades, it constitutes one of the buzzwords of international relationships, while it is the subject of various strategies launched by the EU, US and other countries either individually or not. The share of MS market was \$16.71 billion in 2016 and is expected to grow up to \$23.67 Billion by 2021. Also, a significant part of maritime security and safety is coastal surveillance, which is estimated to grow from \$29.08 billion in 2016 to \$34.34 billion by 2021.

Based on the methodological approach of the deliverable for the identification and assessment of the MS Business/market opportunities, as depicted on the section 3 of the current report, PPA SA, as task leader proceeded to analyze the answers to the country assessment questionnaires.

As derived by the analysis the most important applications identified for all countries overall are: a. Radar Vessel Tracking Systems, b. Aerial Surveillance, c. Satellite signal detection, d. Alert Management Systems and e. Patrol Surveillance.

In addition, Radar Vessel Tracking Systems are prominent in all countries as of high importance and are also commonly important to all MS subsectors, apart from Marine Environment Monitoring.

In depth analysis per application, per sector, per country has been implemented and is described in detail in section 5. As a general comment, more or less, all applications that were mapped in 3.3.1 are deemed as important at least to one country which is a very promising fact for the project, as all MS sectors addressed can potentially be covered by the available technologies globally.

8. References

1. <http://www.marketsandmarkets.com/Market-Reports/coastal-surveillance-market-89731714.html>
2. <http://www.marketsandmarkets.com/PressReleases/coastal-surveillance.asp>
3. <http://www.prnewswire.com/news-releases/global-airborne-maritime-surveillance-aircraft-market-forecast-to-2026-300487202.html>
4. <https://www.reportlinker.com/p05001036/Global-Airborne-Maritime-Surveillance-Aircraft-Market-Forecast-to.html>
5. <https://www.marinetechologynews.com/news/maritime-surveillance-millennium-522162>
6. [https://www.porttechnology.org/news/maritime safety and security tech to grow](https://www.porttechnology.org/news/maritime-safety-and-security-tech-to-grow)
7. <http://www.marketsandmarkets.com/PressReleases/maritime-security.asp>
8. <https://www.technavio.com/report/global-defense-global-maritime-patrol-aircraft-market-2017-2021>
9. <http://www.prnewswire.com/news-releases/maritime-safety-market-worth-2367-billion-usd-by-2021-600012871.html>
10. <https://www.theparliamentmagazine.eu/articles/news/space-technologies-can-support-eus-maritime-sector>
11. [http://health2market.eu/documents/innovation strategy in rd projects - a step by step guide.pdf](http://health2market.eu/documents/innovation-strategy-in-rd-projects-a-step-by-step-guide.pdf)

9. Annex 1 - Filled in Questionnaires

COUNTRY: FRANCE

Scale 1-5 (1: not important, 5: very important)

1. How important is Image detection & processing for on-board surveillance in your country for							
Border Control	4	General Law Enforcement	3	Defence	5	Customs	4
Maritime Safety & Security	4	Fisheries Management	3	Marine Environment Monitoring	4		
2. How important is Aerial surveillance in your country for							
Border Control	4	General Law Enforcement	3	Defence	5	Customs	5
Maritime Safety & Security	5	Fisheries Management	4	Marine Environment Monitoring	5		
3. How important is Video processing for remote surveillance in your country for							
Border Control	5	General Law Enforcement	4	Defence	5	Customs	4
Maritime Safety & Security	5	Fisheries Management	4	Marine Environment Monitoring	4		
4. How important is Data processing from remote sensors in your country for							
Border Control	4	General Law Enforcement	3	Defence	5	Customs	4
Maritime Safety & Security	4	Fisheries Management	4	Marine Environment Monitoring	4		
5. How important are Alert Management Systems in your country for							
Border Control	5	General Law Enforcement	4	Defence	5	Customs	5
Maritime Safety & Security	5	Fisheries Management	4	Marine Environment Monitoring	4		
6. How important are Radar Vessel Tracking Systems in your country for							
Border Control	5	General Law Enforcement	4	Defence	5	Customs	5
Maritime Safety & Security	5	Fisheries Management	3	Marine Environment Monitoring	4		
7. How important is signal processing recorders in your country for							
Border Control	5	General Law Enforcement	3	Defence	5	Customs	5

Maritime Safety & Security	5	Fisheries Management	3	Marine Environment Monitoring	4
8. How important is Image detection & processing for fixed installations in your country for					
Border Control	5	General Law Enforcement	4	Defence	5
Customs	5				
Maritime Safety & Security	5	Fisheries Management	4	Marine Environment Monitoring	4
9. How important is Data transmission sensors for measurements at sea in your country for					
Border Control	3	General Law Enforcement	5	Defence	5
Customs	3				
Maritime Safety & Security	4	Fisheries Management	4	Marine Environment Monitoring	4
10. How important is MS Topics Training, Ready Solutions & Services in your country for					
Border Control	4	General Law Enforcement	3	Defence	5
Customs	5				
Maritime Safety & Security	5	Fisheries Management	3	Marine Environment Monitoring	3
11. How important is Satellite signal detection in your country for					
Border Control	4	General Law Enforcement	4	Defence	5
Customs	4				
Maritime Safety & Security	5	Fisheries Management	2	Marine Environment Monitoring	4
12. How important is Wireless tactical communication for vessels in your country for					
Border Control	4	General Law Enforcement	2	Defence	5
Customs	4				
Maritime Safety & Security	5	Fisheries Management	2	Marine Environment Monitoring	3
13. How important is Signal processing for remote monitoring and analysis of ship functions in real time in your country for					
Border Control	3	General Law Enforcement	1	Defence	5
Customs	3				
Maritime Safety & Security	3	Fisheries Management	2	Marine Environment Monitoring	2
14. How important is Test equipment for naval systems in your country for					
Border Control	3	General Law Enforcement	3	Defence	5
Customs	3				
Maritime Safety & Security	4	Fisheries Management	2	Marine Environment Monitoring	2

15. How important is Data collection and processing for underwater parameters in your country for							
Border Control	1	General Law Enforcement	3	Defence	5	Customs	1
Maritime Safety & Security	2	Fisheries Management	3	Marine Environment Monitoring	3		
16. How important is Supporting Underwater component manipulator in your country for							
Border Control	1	General Law Enforcement	1	Defence	5	Customs	2
Maritime Safety & Security	4	Fisheries Management	4	Marine Environment Monitoring	4		
17. How important is Patrol Surveillance in your country for							
Border Control	5	General Law Enforcement	4	Defence	5	Customs	5
Maritime Safety & Security	5	Fisheries Management	2	Marine Environment Monitoring	2		

COUNTRY: CYPRUS

Scale 1-5 (1: not important, 5: very important)

1. How important is Image detection & processing for on-board surveillance in your country for							
Border Control	5	General Law Enforcement	4	Defence	3	Customs	1
Maritime Safety & Security	5	Fisheries Management	2	Marine Environment Monitoring	2		
2. How important is Aerial surveillance in your country for							
Border Control	5	General Law Enforcement	5	Defence	5	Customs	4
Maritime Safety & Security	5	Fisheries Management	2	Marine Environment Monitoring	5		
3. How important is Video processing for remote surveillance in your country for							
Border Control	5	General Law Enforcement	3	Defence	3	Customs	2
Maritime Safety & Security	5	Fisheries Management	1	Marine Environment Monitoring	5		
4. How important is Data processing from remote sensors in your country for							
Border Control	4	General Law Enforcement	4	Defence	4	Customs	2
Maritime Safety & Security	4	Fisheries Management	3	Marine Environment Monitoring	5		
5. How important are Alert Management Systems in your country for							
Border Control	4	General Law Enforcement	4	Defence	4	Customs	2
Maritime Safety & Security	5	Fisheries Management	4	Marine Environment Monitoring	5		
6. How important are Radar Vessel Tracking Systems in your country for							
Border Control	5	General Law Enforcement	4	Defence	4	Customs	4
Maritime Safety & Security	5	Fisheries Management	4	Marine Environment Monitoring	2		
7. How important is signal processing recorders in your country for							
Border Control	4	General Law Enforcement	4	Defence	4	Customs	2
Maritime Safety & Security	5	Fisheries Management	2	Marine Environment Monitoring	5		
8. How important is Image detection & processing for fixed installations in your country for							

Border Control	5	General Law Enforcement	4	Defence	3	Customs	1
Maritime Safety & Security	5	Fisheries Management	2	Marine Environment Monitoring	2		
9. How important is Data transmission sensors for measurements at sea in your country for							
Border Control	4	General Law Enforcement	4	Defence	4	Customs	1
Maritime Safety & Security	5	Fisheries Management	5	Marine Environment Monitoring	5		
10. How important is MS Topics Training, Ready Solutions & Services in your country for							
Border Control	5	General Law Enforcement	5	Defence	5	Customs	3
Maritime Safety & Security	5	Fisheries Management	5	Marine Environment Monitoring	5		
11. How important is Satellite signal detection in your country for							
Border Control	5	General Law Enforcement	5	Defence	4	Customs	3
Maritime Safety & Security	5	Fisheries Management	4	Marine Environment Monitoring	4		
12. How important is Wireless tactical communication for vessels in your country for							
Border Control	4	General Law Enforcement	5	Defence	5	Customs	3
Maritime Safety & Security	5	Fisheries Management	2	Marine Environment Monitoring	4		
13. How important is Signal processing for remote monitoring and analysis of ship functions in real time in your country for							
Border Control	2	General Law Enforcement	2	Defence	2	Customs	1
Maritime Safety & Security	2	Fisheries Management	2	Marine Environment Monitoring	2		
14. How important is Test equipment for naval systems in your country for							
Border Control	4	General Law Enforcement	1	Defence	4	Customs	1
Maritime Safety & Security	4	Fisheries Management	1	Marine Environment Monitoring	1		
15. How important is Data collection and processing for underwater parameters in your country for							
Border Control	4	General Law Enforcement	4	Defence	4	Customs	2

Maritime Safety & Security	4	Fisheries Management	2	Marine Environment Monitoring	5		
16. How important is Supporting Underwater component manipulator in your country for							
Border Control	2	General Law Enforcement	2	Defence	4	Customs	2
Maritime Safety & Security	4	Fisheries Management	1	Marine Environment Monitoring	2		
17. How important is Patrol Surveillance in your country for							
Border Control	4	General Law Enforcement	4	Defence	4	Customs	4
Maritime Safety & Security	4	Fisheries Management	4	Marine Environment Monitoring	4		

COUNTRY: ITALY

Scale 1-5 (1: not important, 5: very important)

1. How important is Image detection & processing for on-board surveillance in your country for							
Border Control	2	General Law Enforcement	3	Defence	2	Customs	1
Maritime Safety & Security	5	Fisheries Management	4	Marine Environment Monitoring	4		
2. How important is Aerial surveillance in your country for							
Border Control	5	General Law Enforcement	3	Defence	5	Customs	3
Maritime Safety & Security	5	Fisheries Management	5	Marine Environment Monitoring	5		
3. How important is Video processing for remote surveillance in your country for							
Border Control	4	General Law Enforcement	2	Defence	4	Customs	3
Maritime Safety & Security	5	Fisheries Management	3	Marine Environment Monitoring	4		
4. How important is Data processing from remote sensors in your country for							
Border Control	5	General Law Enforcement	2	Defence	5	Customs	3
Maritime Safety & Security	5	Fisheries Management	4	Marine Environment Monitoring	5		
5. How important are Alert Management Systems in your country for							
Border Control	5	General Law Enforcement	3	Defence	5	Customs	4
Maritime Safety & Security	5	Fisheries Management	4	Marine Environment Monitoring	5		
6. How important are Radar Vessel Tracking Systems in your country for							
Border Control	5	General Law Enforcement	4	Defence	5	Customs	4
Maritime Safety & Security	5	Fisheries Management	4	Marine Environment Monitoring	4		
7. How important is signal processing recorders in your country for							
Border Control	5	General Law Enforcement	3	Defence	5	Customs	2
Maritime Safety & Security	5	Fisheries Management	2	Marine Environment Monitoring	5		
8. How important is Image detection & processing for fixed installations in your country for							
Border	5	General Law	4	Defence	5	Customs	3

Control		Enforcement					
Maritime Safety & Security	5	Fisheries Management	4	Marine Environment Monitoring	3		
9. How important is Data transmission sensors for measurements at sea in your country for							
Border Control	2	General Law Enforcement	3	Defence	2	Customs	1
Maritime Safety & Security	5	Fisheries Management	5	Marine Environment Monitoring	5		
10. How important is MS Topics Training, Ready Solutions & Services in your country for							
Border Control	4	General Law Enforcement	4	Defence	5	Customs	4
Maritime Safety & Security	5	Fisheries Management	5	Marine Environment Monitoring	4		
11. How important is Satellite signal detection in your country for							
Border Control	4	General Law Enforcement	3	Defence	4	Customs	4
Maritime Safety & Security	5	Fisheries Management	4	Marine Environment Monitoring	5		
12. How important is Wireless tactical communication for vessels in your country for							
Border Control	5	General Law Enforcement	4	Defence	5	Customs	4
Maritime Safety & Security	5	Fisheries Management	3	Marine Environment Monitoring	4		
13. How important is Signal processing for remote monitoring and analysis of ship functions in real time in your country for							
Border Control	5	General Law Enforcement	5	Defence	5	Customs	3
Maritime Safety & Security	5	Fisheries Management	4	Marine Environment Monitoring	4		
14. How important is Test equipment for naval systems in your country for							
Border Control	4	General Law Enforcement	2	Defence	5	Customs	1
Maritime Safety & Security	4	Fisheries Management	1	Marine Environment Monitoring	1		
15. How important is Data collection and processing for underwater parameters in your country for							
Border Control	4	General Law Enforcement	4	Defence	4	Customs	1
Maritime Safety & Security	4	Fisheries Management	2	Marine Environment Monitoring	4		
16. How important is Supporting Underwater component manipulator in your country for							

PROTEUS – 3.3.2 Identification of the market/ business opportunities

Border Control	2	General Law Enforcement	4	Defence	4	Customs	1
Maritime Safety & Security	4	Fisheries Management	3	Marine Environment Monitoring	4		
17. How important is Patrol Surveillance in your country for							
Border Control	4	General Law Enforcement	4	Defence	4	Customs	3
Maritime Safety & Security	5	Fisheries Management	3	Marine Environment Monitoring	4		

COUNTRY: SPAIN

Scale 1-5 (1: not important, 5: very important)

1. How important is Image detection & processing for on-board surveillance in your country for							
Border Control	5	General Law Enforcement	3	Defence	5	Customs	4
Maritime Safety & Security	4	Fisheries Management	3	Marine Environment Monitoring	4		
2. How important is Aerial surveillance in your country for							
Border Control	5	General Law Enforcement	3	Defence	4	Customs	4
Maritime Safety & Security	3	Fisheries Management	3	Marine Environment Monitoring	4		
3. How important is Video processing for remote surveillance in your country for							
Border Control	4	General Law Enforcement	3	Defence	5	Customs	5
Maritime Safety & Security	5	Fisheries Management	3	Marine Environment Monitoring	5		
4. How important is Data processing from remote sensors in your country for							
Border Control	5	General Law Enforcement	3	Defence	3	Customs	4
Maritime Safety & Security	5	Fisheries Management	4	Marine Environment Monitoring	5		
5. How important are Alert Management Systems in your country for							
Border Control	4	General Law Enforcement	3	Defence	4	Customs	4
Maritime Safety & Security	5	Fisheries Management	3	Marine Environment Monitoring	4		
6. How important are Radar Vessel Tracking Systems in your country for							
Border Control	5	General Law Enforcement	2	Defence	5	Customs	5
Maritime Safety & Security	5	Fisheries Management	4	Marine Environment Monitoring	5		
7. How important is signal processing recorders in your country for							
Border Control	4	General Law Enforcement	5	Defence	3	Customs	4
Maritime Safety & Security	4	Fisheries Management	2	Marine Environment Monitoring	4		
8. How important is Image detection & processing for fixed installations in your country for							
Border	3	General Law	4	Defence	2	Customs	3

Control		Enforcement					
Maritime Safety & Security	2	Fisheries Management	2	Marine Environment Monitoring	2		
9. How important is Data transmission sensors for measurements at sea in your country for							
Border Control	2	General Law Enforcement	2	Defence	2	Customs	4
Maritime Safety & Security	5	Fisheries Management	5	Marine Environment Monitoring	5		
10. How important is MS Topics Training, Ready Solutions & Services in your country for							
Border Control	2	General Law Enforcement	2	Defence	4	Customs	4
Maritime Safety & Security	4	Fisheries Management	3	Marine Environment Monitoring	5		
11. How important is Satellite signal detection in your country for							
Border Control	5	General Law Enforcement	2	Defence	5	Customs	5
Maritime Safety & Security	5	Fisheries Management	4	Marine Environment Monitoring	5		
12. How important is Wireless tactical communication for vessels in your country for							
Border Control	5	General Law Enforcement	2	Defence	5	Customs	5
Maritime Safety & Security	4	Fisheries Management	2	Marine Environment Monitoring	4		
13. How important is Signal processing for remote monitoring and analysis of ship functions in real time in your country for							
Border Control	5	General Law Enforcement	4	Defence	5	Customs	5
Maritime Safety & Security	5	Fisheries Management	4	Marine Environment Monitoring	5		
14. How important is Test equipment for naval systems in your country for							
Border Control	4	General Law Enforcement	3	Defence	4	Customs	4
Maritime Safety & Security	4	Fisheries Management	4	Marine Environment Monitoring	4		
15. How important is Data collection and processing for underwater parameters in your country for							
Border Control	2	General Law Enforcement	4	Defence	5	Customs	2
Maritime Safety & Security	5	Fisheries Management	3	Marine Environment Monitoring	4		
16. How important is Supporting Underwater component manipulator in your country for							

PROTEUS – 3.3.2 Identification of the market/ business opportunities

Border Control	3	General Law Enforcement	3	Defence	5	Customs	3
Maritime Safety & Security	5	Fisheries Management	3	Marine Environment Monitoring	4		
17. How important is Patrol Surveillance in your country for							
Border Control	5	General Law Enforcement	4	Defence	5	Customs	5
Maritime Safety & Security	3	Fisheries Management	3	Marine Environment Monitoring	5		

COUNTRY: PORTUGAL

Scale 1-5 (1: not important, 5: very important)

1. How important is Image detection & processing for on-board surveillance in your country for							
Border Control	4	General Law Enforcement	3	Defence	3	Customs	4
Maritime Safety & Security	4	Fisheries Management	3	Marine Environment Monitoring	3		
2. How important is Aerial surveillance in your country for							
Border Control	5	General Law Enforcement	4	Defence	5	Customs	4
Maritime Safety & Security	4	Fisheries Management	3	Marine Environment Monitoring	2		
3. How important is Video processing for remote surveillance in your country for							
Border Control	4	General Law Enforcement	4	Defence	4	Customs	4
Maritime Safety & Security	4	Fisheries Management	3	Marine Environment Monitoring	2		
4. How important is Data processing from remote sensors in your country for							
Border Control	2	General Law Enforcement	2	Defence	3	Customs	3
Maritime Safety & Security	4	Fisheries Management	4	Marine Environment Monitoring	4		
5. How important are Alert Management Systems in your country for							
Border Control	4	General Law Enforcement	4	Defence	4	Customs	4
Maritime Safety & Security	4	Fisheries Management	4	Marine Environment Monitoring	4		
6. How important are Radar Vessel Tracking Systems in your country for							
Border Control	5	General Law Enforcement	5	Defence	5	Customs	5
Maritime Safety & Security	5	Fisheries Management	4	Marine Environment Monitoring	4		
7. How important is signal processing recorders in your country for							
Border Control	3	General Law Enforcement	3	Defence	4	Customs	4
Maritime Safety & Security	3	Fisheries Management	3	Marine Environment Monitoring	3		
8. How important is Image detection & processing for fixed installations in your country for							
Border	5	General Law	5	Defence	5	Customs	4

Control		Enforcement					
Maritime Safety & Security	4	Fisheries Management	3	Marine Environment Monitoring	3		
9. How important is Data transmission sensors for measurements at sea in your country for							
Border Control	3	General Law Enforcement	3	Defence	3	Customs	2
Maritime Safety & Security	3	Fisheries Management	3	Marine Environment Monitoring	4		
10. How important is MS Topics Training, Ready Solutions & Services in your country for							
Border Control	4	General Law Enforcement	4	Defence	4	Customs	4
Maritime Safety & Security	3	Fisheries Management	3	Marine Environment Monitoring	4		
11. How important is Satellite signal detection in your country for							
Border Control	3	General Law Enforcement	3	Defence	4	Customs	3
Maritime Safety & Security	4	Fisheries Management	4	Marine Environment Monitoring	4		
12. How important is Wireless tactical communication for vessels in your country for							
Border Control	4	General Law Enforcement	4	Defence	4	Customs	4
Maritime Safety & Security	3	Fisheries Management	3	Marine Environment Monitoring	3		
13. How important is Signal processing for remote monitoring and analysis of ship functions in real time in your country for							
Border Control	4	General Law Enforcement	4	Defence	4	Customs	4
Maritime Safety & Security	4	Fisheries Management	4	Marine Environment Monitoring	3		
14. How important is Test equipment for naval systems in your country for							
Border Control	3	General Law Enforcement	3	Defence	4	Customs	3
Maritime Safety & Security	4	Fisheries Management	5	Marine Environment Monitoring	4		
15. How important is Data collection and processing for underwater parameters in your country for							
Border Control	2	General Law Enforcement	2	Defence	3	Customs	2
Maritime Safety & Security	2	Fisheries Management	4	Marine Environment Monitoring	4		
16. How important is Supporting Underwater component manipulator in your country for							

PROTEUS – 3.3.2 Identification of the market/ business opportunities

Border Control	2	General Law Enforcement	2	Defence	3	Customs	2
Maritime Safety & Security	2	Fisheries Management	3	Marine Environment Monitoring	3		
17. How important is Patrol Surveillance in your country for							
Border Control	5	General Law Enforcement	5	Defence	5	Customs	5
Maritime Safety & Security	5	Fisheries Management	5	Marine Environment Monitoring	3		

COUNTRY: _____ GREECE _____

Scale 1-5 (1: not important, 5: very important)

1. How important is Image detection & processing for on-board surveillance in your country for							
Border Control	5	General Law Enforcement	4	Defence	3	Customs	3
Maritime Safety & Security	5	Fisheries Management	2	Marine Environment Monitoring	3		
2. How important is Aerial surveillance in your country for							
Border Control	5	General Law Enforcement	4	Defence	4	Customs	3
Maritime Safety & Security	5	Fisheries Management	2	Marine Environment Monitoring	4		
3. How important is Video processing for remote surveillance in your country for							
Border Control	5	General Law Enforcement	4	Defence	4	Customs	3
Maritime Safety & Security	5	Fisheries Management	3	Marine Environment Monitoring	4		
4. How important is Data processing from remote sensors in your country for							
Border Control	4	General Law Enforcement	3	Defence	4	Customs	3
Maritime Safety & Security	4	Fisheries Management	3	Marine Environment Monitoring	4		
5. How important are Alert Management Systems in your country for							
Border Control	4	General Law Enforcement	4	Defence	4	Customs	3
Maritime Safety & Security	5	Fisheries Management	3	Marine Environment Monitoring	3		
6. How important are Radar Vessel Tracking Systems in your country for							
Border Control	5	General Law Enforcement	5	Defence	5	Customs	3
Maritime Safety & Security	5	Fisheries Management	3	Marine Environment Monitoring	3		
7. How important is signal processing recorders in your country for							
Border Control	4	General Law Enforcement	4	Defence	4	Customs	3
Maritime Safety & Security	5	Fisheries Management	2	Marine Environment Monitoring	5		
8. How important is Image detection & processing for fixed installations in your country for							

Border Control	5	General Law Enforcement	5	Defence	5	Customs	2
Maritime Safety & Security	3	Fisheries Management	2	Marine Environment Monitoring	2		
9. How important is Data transmission sensors for measurements at sea in your country for							
Border Control	2	General Law Enforcement	2	Defence	2	Customs	1
Maritime Safety & Security	4	Fisheries Management	5	Marine Environment Monitoring	5		
10. How important is MS Topics Training, Ready Solutions & Services in your country for							
Border Control	4	General Law Enforcement	4	Defence	4	Customs	3
Maritime Safety & Security	4	Fisheries Management	3	Marine Environment Monitoring	3		
11. How important is Satellite signal detection in your country for							
Border Control	5	General Law Enforcement	5	Defence	5	Customs	4
Maritime Safety & Security	5	Fisheries Management	2	Marine Environment Monitoring	3		
12. How important is Wireless tactical communication for vessels in your country for							
Border Control	5	General Law Enforcement	5	Defence	5	Customs	4
Maritime Safety & Security	5	Fisheries Management	2	Marine Environment Monitoring	2		
13. How important is Signal processing for remote monitoring and analysis of ship functions in real time in your country for							
Border Control	2	General Law Enforcement	2	Defence	2	Customs	2
Maritime Safety & Security	5	Fisheries Management	2	Marine Environment Monitoring	2		
14. How important is Test equipment for naval systems in your country for							
Border Control	4	General Law Enforcement	3	Defence	4	Customs	3
Maritime Safety & Security	4	Fisheries Management	3	Marine Environment Monitoring	3		
15. How important is Data collection and processing for underwater parameters in your country for							
Border Control	4	General Law Enforcement	3	Defence	4	Customs	2

Maritime Safety & Security	4	Fisheries Management	2	Marine Environment Monitoring	3
16. How important is Supporting Underwater component manipulator in your country for					
Border Control	4	General Law Enforcement	3	Defence	4
Customs	2				
Maritime Safety & Security	4	Fisheries Management	2	Marine Environment Monitoring	3
17. How important is Patrol Surveillance in your country for					
Border Control	4	General Law Enforcement	3	Defence	3
Customs	4				
Maritime Safety & Security	4	Fisheries Management	2	Marine Environment Monitoring	3

10. Annex 2 – Matrix Table

APPLICATION	IN	GR	IT	PT	ES	FR	CY	TOTALS
1. Image detection & processing for on-board surveillance	Border Control	5	2	4	5	4	5	25
	General Law Enforcement	4	3	3	3	3	4	20
	Defence	3	2	3	5	5	3	21
	Customs	3	1	4	4	4	1	17
	Maritime Safety & Security	5	5	4	4	4	5	27
	Fisheries Management	2	4	3	3	3	2	17
	Marine Environment Monitoring	3	4	3	4	4	2	20
		25	21	24	28	27	22	
2. Aerial surveillance	Border Control	5	5	5	5	4	5	29
	General Law Enforcement	4	3	4	3	3	5	22
	Defence	4	5	5	4	5	5	28
	Customs	3	3	4	4	5	4	23
	Maritime Safety & Security	5	5	4	3	5	5	27
	Fisheries Management	2	5	3	3	4	2	19
	Marine Environment Monitoring	4	5	2	4	5	5	25
		27	31	27	26	31	31	
3. Video processing for remote surveillance	Border Control	5	4	4	4	5	5	27
	General Law Enforcement	4	2	4	3	4	3	20
	Defence	4	4	4	5	5	3	25
	Customs	3	3	4	5	4	2	21
	Maritime Safety & Security	5	5	4	5	5	5	29
	Fisheries Management	3	3	3	3	4	1	17
	Marine Environment Monitoring	4	4	2	5	4	5	24
		28	25	25	30	31	24	
4. Data processing from remote sensors	Border Control	4	5	2	5	4	4	24
	General Law Enforcement	3	2	2	3	3	4	17
	Defence	4	5	3	3	5	4	24
	Customs	3	3	3	4	4	2	19
	Maritime Safety & Security	4	5	4	5	4	4	26
	Fisheries Management	3	4	4	4	4	3	22
	Marine Environment Monitoring	4	5	4	5	4	5	27
		25	29	22	29	28	26	
5. Alert Management Systems	Border Control	4	5	4	4	5	4	26
	General Law Enforcement	4	3	4	3	4	4	22
	Defence	4	5	4	4	5	4	26
	Customs	3	4	4	4	5	2	22
	Maritime Safety & Security	5	5	4	5	5	5	29
	Fisheries Management	3	4	4	3	4	4	22
	Marine Environment Monitoring	3	5	4	4	4	5	25
		26	31	28	27	32	28	
6. Radar Vessel Tracking Systems	Border Control	5	5	5	5	5	5	30
	General Law Enforcement	5	4	5	2	4	4	24
	Defence	5	5	5	5	5	4	29
	Customs	3	4	5	5	5	4	26
	Maritime Safety & Security	5	5	5	5	5	5	30
	Fisheries Management	3	4	4	4	3	4	22
	Marine Environment Monitoring	3	4	4	5	4	2	22
		29	31	33	31	31	28	
7. Signal processing recorders	Border Control	4	5	3	4	5	4	25
	General Law Enforcement	4	3	3	5	3	4	22
	Defence	4	5	4	3	5	4	25
	Customs	3	2	4	4	5	2	20
	Maritime Safety & Security	5	5	3	4	5	5	27
	Fisheries Management	2	2	3	2	3	2	14
	Marine Environment Monitoring	5	5	3	4	4	5	26
		27	27	23	26	30	26	
8. Image detection & processing for fixed installations	Border Control	5	5	5	3	5	5	28
	General Law Enforcement	5	4	5	4	4	4	26
	Defence	5	5	5	2	5	3	25
	Customs	2	3	4	3	5	1	18
	Maritime Safety & Security	3	5	4	2	5	5	24
	Fisheries Management	2	4	3	2	4	2	17
	Marine Environment Monitoring	2	3	3	2	4	2	16
		24	29	29	18	32	22	
9. Data transmission sensors for measurements at sea	Border Control	2	2	3	2	3	4	16
	General Law Enforcement	2	3	3	2	5	4	19
	Defence	2	2	3	2	5	4	18
	Customs	1	1	2	4	3	1	12
	Maritime Safety & Security	4	5	3	5	4	5	26
	Fisheries Management	5	5	3	5	4	5	27
	Marine Environment Monitoring	5	5	4	5	4	5	28
		21	23	21	25	28	28	
10. MS Topics Training, Ready Solutions & Services	Border Control	4	4	4	2	4	5	23
	General Law Enforcement	4	4	4	2	3	5	22
	Defence	4	5	4	4	5	5	27
	Customs	3	4	4	4	5	3	23
	Maritime Safety & Security	4	5	3	4	5	5	26
	Fisheries Management	3	5	3	3	3	5	22
	Marine Environment Monitoring	3	4	4	5	3	5	24
		25	31	26	24	28	33	

11. Satellite signal detection	Border Control	5	4	3	5	4	5	26	172
	General Law Enforcement	5	3	3	2	4	5	22	
	Defence	5	4	4	5	5	4	27	
	Customs	4	4	3	5	4	3	23	
	Maritime Safety & Security	5	5	4	5	5	5	29	
	Fisheries Management	2	4	4	4	2	4	20	
	Marine Environment Monitoring	3	5	4	5	4	4	25	
		29	29	25	31	28	30		
12. Wireless tactical communication for vessels	Border Control	5	5	4	5	4	4	27	163
	General Law Enforcement	5	4	4	2	2	5	22	
	Defence	5	5	4	5	5	5	29	
	Customs	4	4	4	5	4	3	24	
	Maritime Safety & Security	5	5	3	4	5	5	27	
	Fisheries Management	2	3	3	2	2	2	14	
	Marine Environment Monitoring	2	4	3	4	3	4	20	
		28	30	25	27	25	28		
13. Signal processing for remote monitoring and analysis of ship functions in real time	Border Control	2	5	4	5	3	2	21	140
	General Law Enforcement	2	5	4	4	1	2	18	
	Defence	2	5	4	5	5	2	23	
	Customs	2	3	4	5	3	1	18	
	Maritime Safety & Security	5	5	4	5	3	2	24	
	Fisheries Management	2	4	4	4	2	2	18	
	Marine Environment Monitoring	2	4	3	5	2	2	18	
		17	31	27	33	19	13		
14. Test equipment for naval systems	Border Control	4	4	3	4	3	4	22	133
	General Law Enforcement	3	2	3	3	3	1	15	
	Defence	4	5	4	4	5	4	26	
	Customs	3	1	3	4	3	1	15	
	Maritime Safety & Security	4	4	4	4	4	4	24	
	Fisheries Management	3	1	5	4	2	1	16	
	Marine Environment Monitoring	3	1	4	4	2	1	15	
		24	18	26	27	22	16		
15. Data collection and processing for underwater parameters	Border Control	4	4	2	2	1	4	17	132
	General Law Enforcement	3	4	2	4	3	4	20	
	Defence	4	4	3	5	5	4	25	
	Customs	2	1	2	2	1	2	10	
	Maritime Safety & Security	4	4	2	5	2	4	21	
	Fisheries Management	2	2	4	3	3	2	16	
	Marine Environment Monitoring	3	4	4	4	3	5	23	
		22	23	19	25	18	25		
16. Supporting Underwater component manipulator	Border Control	4	2	2	3	1	2	14	125
	General Law Enforcement	3	4	2	3	1	2	15	
	Defence	4	4	3	5	5	4	25	
	Customs	2	1	2	3	2	2	12	
	Maritime Safety & Security	4	4	2	5	4	4	23	
	Fisheries Management	2	3	3	3	4	1	16	
	Marine Environment Monitoring	3	4	3	4	4	2	20	
		22	22	17	26	21	17		
17. Patrol Surveillance	Border Control	4	4	5	5	5	4	27	169
	General Law Enforcement	3	4	5	4	4	4	24	
	Defence	3	4	5	5	5	4	26	
	Customs	4	3	5	5	5	4	26	
	Maritime Safety & Security	4	5	5	3	5	4	26	
	Fisheries Management	2	3	5	3	2	4	19	
	Marine Environment Monitoring	3	4	3	5	2	4	21	
		23	27	33	30	28	28		
TOTAL		422	458	430	463	459	425		2657