An Enhanced Common Information Sharing Environment for Border Command, Control and Coordination Systems

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D.7.7 Final Workshops Organization and Results

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v.0.2	2021/09/02	Pantelis Kanellopoulos (ICCS)	Final Draft
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v.0.6	2021/09/09	SAB	Review by SAB
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v.1.0	2021/09/10	Athena Foka (MMAIP)	Final version submitted

Executive Summary

The current deliverable reports the activities performed within Task 7.2 "*Workshops Coordination"* towards the organization of the **second ANDROMEDA workshop** that was held virtually on the 23rd June 2021. In conjunction with the workshop the consortium also organized online the Demonstration Event, the day after. These activities include the creation of both events' programme *(Agenda)*, the invitations sent to potential attendees, the digital promotional material created, the creation of the registration link and the information sheet for participation and data processing, the announcements made via the project's website and social media for raising their visibility. Nevertheless, the core part of this document is dedicated in presenting the topics elaborated by the speakers, the discussions made and the results produced from both events.

Lastly, it should be noted that the ANDROMEDA project team decided to organize these events virtually as the vaccination programme across EU member states was under deployment and the risk for spreading the COVID-19 virus to partners, speakers and attendees was still valid.

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1. Introduction

This document describes the activities that the ANDROMEDA consortium made towards organizing its Final Workshop and the Demonstration Event in order to present and promote the project results to the consortium partners, end-users, practitioners and other policy makers and stakeholders. Additionally, summaries with key information from speakers' presentations as well as round table discussions are provided in order to present to the reader the topics elaborated.

1.1 The project: ANDROMEDA

The ANDROMEDA project aims to unlock the full capabilities of the CISE by enhancing the Maritime CISE Model, extending its scope to the Land Surveillance Information Exchange and providing and demonstrating fully compatible Command & Control, Data Fusion and Decision Support systems.

The project will address the "*fragmentation*" and close *"gaps*" providing a secure, effective common situational awareness and information exchange system integrated with CISE. Furthermore, based on the analysis of past and current initiatives in the sphere of Border Security, the project will aim to develop solutions leveraging on the results extracted from relevant projects formerly funded by the EU.

1.2 WP7 Impact Creation, Exploitation and Standardization Activities

WP7 "*Impact Creation, Exploitation and Standardization Activities*" includes dissemination, communication, standardization and exploitation tasks. Its scope is to disseminate the project's results and communicate its objectives to a wide group of stakeholders by utilizing various dissemination and communication channels *(online and offline)* such as web tools, social media, publications, conferences and events *(via participation)* and so on. Moreover, by increasing the visibility of ANDROMEDA and its potential impact to improve the opportunities for exploitation of the project's outcomes. The Work Package consists of five interrelated tasks which namely are:

- T7.1 Dissemination and Communication *(M1-M18);*
- T7.2 Workshops Coordination *(M1-M18);*
- T7.3 IPR Review and Patenting Process *(M8-M18);*
- T7.4 Exploitation Plan and Market Large Uptake Assessment *(M1-M18);*
- T7.5 Standardization *(M1-M18).*

It should be noted that WP7 obtains inputs from all other WPs and ensures that the communication and dissemination of results have been achieved within the individual WPs to the outside parties as well as to participating entities.

1.3 Scope and Objective of D7.7

According to the DoA, the deliverable "*D7.7 Final Workshops Organization and Results"* reports the results from the final workshop. Within this framework the preparatory activities of organizing the second *(final)* ANDROMEDA Workshop are described and the topics as well as the discussions made during the event are explicated. Moreover, its performance in terms of registrants, attendance rate and duration is outlined.

1.4 Intended Audience

Table 1: Intended Audience

Intended Audience	Reason for interest in reading
European Commission	As the funding authority to assess the effort made towards the realization of the 1st ANDROMEDA workshop and to receive a report regarding the activities undertaken by the consortium as well as the discussions and presentations made. This deliverable constitutes an official report to REA / EC as foreseen in the GA.
Project Partners	To be informed about the actions made towards the realization of the event, the presentations made and overall have a common view of the effort spent for its successful realisation.
Stakeholders *(National Border and Coast Guards, Software Industry, End users community, EU institutions, Research institutions, Scientific and Technological community, etc.)*	To be informed about the ANDROMEDA project in general *(scope, motivation, expected impact etc.)*, the offered solution and the results produced so far.
Representatives of organizations involved in EU funded projects under similar topic	To share knowledge, lessons learned and best practices related to the project's topic. Moreover, it can assist in expanding the network of ANDROMEDA project by introducing it to other related EU funded ones.
General Public	To be informed about the project, its scope, its results as well as the discussion and presentations made during the 1st ANDROMEDA workshop.

1.5 Structure

This deliverable is consisted of **four chapters**. The **first chapter** is an introductory one where the reader is informed about the purpose of the project, the tasks included in work package 7 and the scope and objectives of the current deliverable. Moreover, the intended audience is presented along with the reasons for interest in reading D7.7 per each. The **second chapter** outlines the activities made towards organising the event which include the agenda creation, the invitations sent to potential attendees, the digital promotional material created, the announcements made via the project's website and its social media accounts for raising the visibility of the workshop. The **third chapter** constitutes the core part of the document where the topics and the discussions made around them are provided. Lastly, the **fourth chapter** consists the conclusion of this deliverable.

1.6 List of Acronyms

List of Acronyms	
AI	Artificial Intelligence
BG	Bulgarian / Bulgaria
CISE	Common Information Sharing Environment
Cdr.	Commander
CMS	Combat Management System
COP	Common Operational Picture
CSG meetings	CISE Stake Group meetings

List of Acronyms	
C2 systems	Command and Control systems
D7.6	D7.6 Initial Workshops Organization and Results
D7.7	D7.7 Final Workshops Organization and Results
EAMA	Executive Agency “Maritime Administration”
EC	European Commission
e-CISE	enhanced CISE
EMSA	European Maritime Safety Agency
EU	European Union
GDPR	General Data Protection Regulation
GR	Greek / Greece
HCG	Hellenic Coast Guard
HPL	Hellenic Police
ICCS	Institute of Communication and Computer Systems
ITN	Italian Navy
JRC	Joint Research Center
KEMEA	The Center for Security Studies
LAU	LAUREA
Lt. Cdr.	Lieutenant commander
MMAIP	Hellenic Ministry of Maritime Affairs and Insular Policy
MOC	Maritime Operations Centre
MS	Mission System
Mx	Month x
PTN	Portuguese Navy
REA	Research Executive Agency
SAR	Search and Rescue
STWS	SATWAYS
Tx.y	Task x.y
UAV	Unmanned Aerial Vehicle
UxV	Unmanned vehicles for all domains
VPN	Virtual Private Network
WP	Work Package

2. Workshop Organization

Task 7.2 also includes the activities performed towards the organization of the 2nd ANDROMEDA Workshop. In brief, the project team organized it online during June 2021 *(M22)*, and as per DoA description it was made by the responsible partner, EXUS, in close collaboration with the rest of the ANDROMEDA consortium. The activities that were carried out are summarized as follow:

- ICCS (*T7.2 leader)* asked from EXUS *(organizer of the 2nd Workshop)*, KEMEA and STWS *(T7.1 leader)* to nominate a main contact point from their organization in order to create the coordination team that will work on the organization of the event.
- The coordination team for the organization of the 2nd workshop was appointed with members from EXUS, KEMEA, STWS and ICCS.
- Actions list *(activities description, deadlines, responsible partner)* was prepared by ICCS (*T7.2 leader)* and circulated to the coordination team formulated for the organisation of the workshop. The actions list was unanimously approved by all members of this team and followed as agreed.
- Date selection was made by the coordination team in respect to the project's evolvement within the activities of other ANDROMEDA work packages.
- Decision was made to organize the event virtually as the vaccination programme across EU member states was under deployment and the risk for spreading the COVID-19 virus to participants and project partners was still valid.
- Decided the 2nd Workshop to be organized in conjunction with the Demonstration Event *(Trial sessions).*
- Agreed with the consortium the date for organising the online event *(23rd – 24th June 2021).*
- Decided the web tool *(zoom.us)* for hosting large online event together with the capability of multiscreen sharing.
- Created the online registration form.
- Speakers for the event were proposed by all partners, the options were evaluated and selection was made by the coordination team.
- Contacted the selected speakers.
- Finalised the Agenda *(topics, speakers, time frame).*
- Prepared the questions address to speakers for the round table discussions.
- Prepared the questions address to attendees for event's evaluation *(poll via slido.com).*
- Created the leaflet dedicated to the event in order to promote the 2nd Workshop to a wide audience. Also, it accompanied the invitations sent to potential participants.
- Promoted the event via project's website and social media.
- Enriched the list with potential participants which was already available from the organisation of the 1st Workshop.
- Sent invitations to potential participants.
- Communicated the event within the consortium's network and contacts.

The aforementioned activities were coordinated by EXUS *(organizer of the 2nd Workshop)* and KEMEA with the support of SATWAYS *(T7.1 leader)* while ICCS *(T7.2 leader)* monitored their implementation and progress.

2.1 Invitations List

The initial invitation list was created for inviting potential participants to the 1st ANDROMEDA Workshop that was held in September 2020 *(M13)* and was presented in the deliverable D7.6 Initial Workshops Organization and Results. The aforementioned one was based on the stakeholder analysis made in T7.1 and in conjunction with end users list created by LAU, the T7.2 leader *(ICCS)* structured the initial invitation list. It

was circulated to the consortium and partners were asked to suggest contacts with interest on the project's topic. Later on, an updated version of the invitations list was created for the 2nd Workshop and it was enriched by further partners' contribution with contacts and it was finalised by KEMEA. All contacts included were invited via various communication channels while all available professional networks were also utilized.

2.2 Agenda

As ANDROMEDA received a six-month extension to its lifecycle the project officially completed its activities in the end of August 2021 *(M24)*. For this reason, the timeframe was modified compared to the initial planning of the project and the preparatory discussions around the organisation of the 2nd Workshop started in March 2021.

These discussions also included brainstorming by the coordination team about the topics to be presented in the 2nd Workshop and paved the way for the creation of the Agenda. EXUS *(organizer of the 2nd Workshop)* formulated the discussion made into a draft version of the Agenda. Based on the draft version and in consistent with the project results produced by ANDROMEDA consortium, potential speakers were proposed by project partners. Later on, the options for speakers were evaluated by the coordination team that had undertaken the organization of the 2nd workshop *(EXUS, KEMEA, STWS, ICCS)* and selection was made.

The pre-final version was circulated to ANDROMEDA partners by EXUS and comments were collected for ensuring the highest quality of project's actions. Lastly, the Agenda was finalised by EXUS in close collaboration with KEMEA. The programme of the event is available online at project's website and for reader's ease it is provided at the following sub-sections while screenshots from the original agenda can be found in the figures below *(see Figure 1, Figure 2, Figure 3)*.


SU-BES03-2018, Subtopic: Open
Demonstration of applied solutions to enhance border and external security

andromeda

An Enhanced Common Information Sharing Environment for Border Command, Control and Coordination Systems

Grant Agreement Number: 833881

Agenda
ANDROMEDA Final Workshop
Online Event

23-24 June 2021 (times in CEST)

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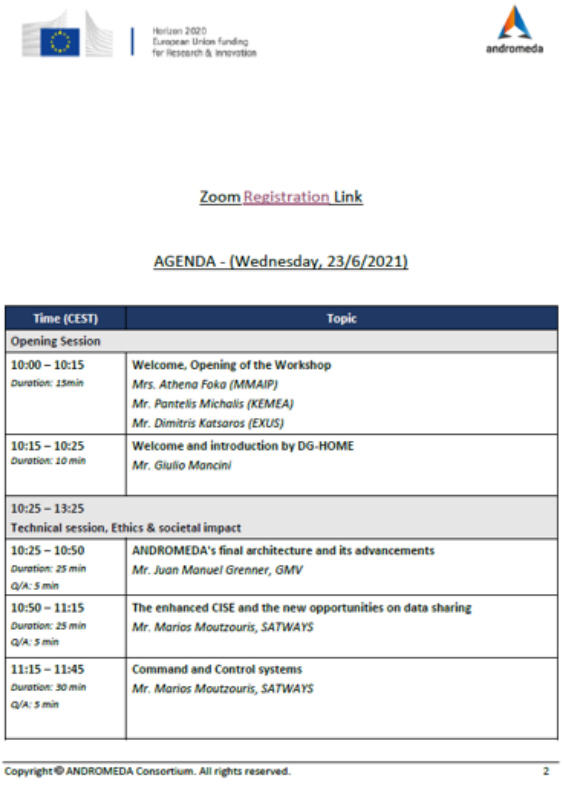
Zoom Registration Link

AGENDA - (Wednesday, 23/6/2021)

Time (CEST)	Topic
Opening Session	
10:00 – 10:15 Duration: 15min	Welcome, Opening of the Workshop *Mrs. Athena Foka (MMAIP)* *Mr. Pantelis Michalis (KEMEA)* *Mr. Dimitris Katsaros (EXUS)*
10:15 – 10:25 Duration: 10 min	Welcome and introduction by DG-HOME *Mr. Giulio Mancini*
10:25 – 13:25 Technical session, Ethics & societal impact	
10:25 – 10:50 Duration: 25 min Q/A: 5 min	ANDROMEDA's final architecture and its advancements *Mr. Juan Manuel Grenner, GMV*
10:50 – 11:15 Duration: 25 min Q/A: 5 min	The enhanced CISE and the new opportunities on data sharing *Mr. Marios Moutzouris, SATWAYS*
11:15 – 11:45 Duration: 30 min Q/A: 5 min	Command and Control systems *Mr. Marios Moutzouris, SATWAYS*

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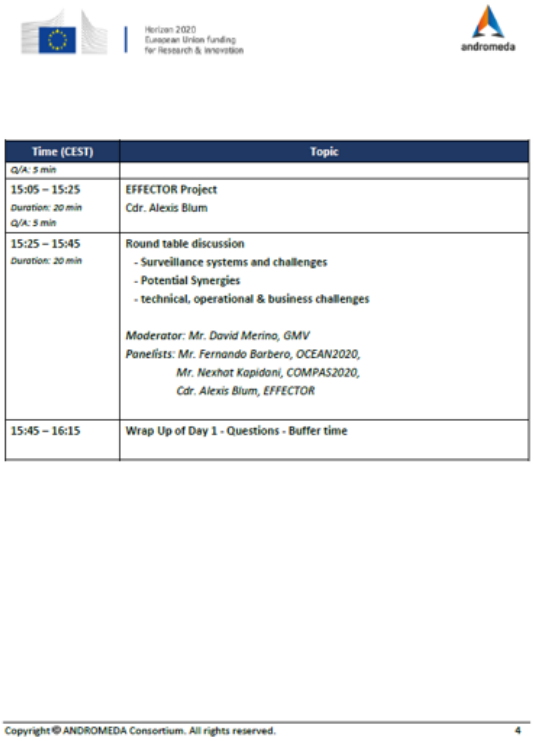
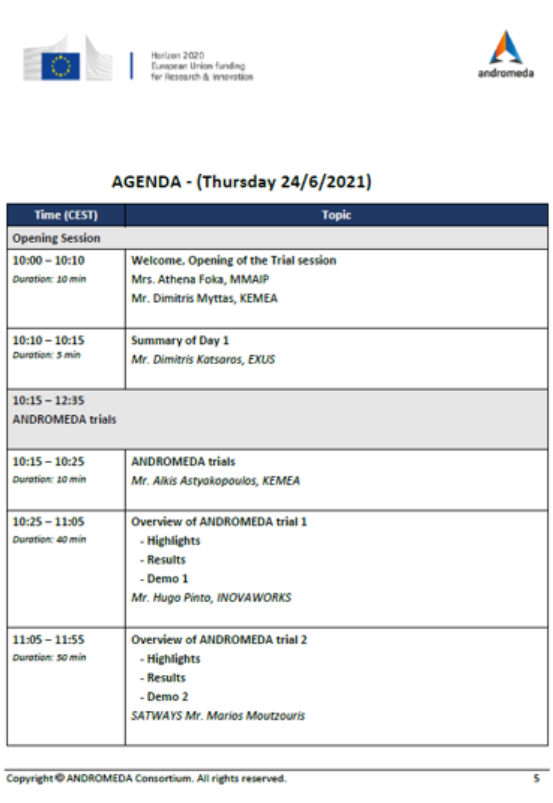
Figure 1: Final Workshop & Demonstration Event Agenda (pp. 1-2)

Time (CEST)	Topic
11:45 - 12:00 *15 min*	**Coffee Break**
12:00 – 12:25 *Duration: 20 min* *Q/A: 5 min*	Advanced Data Fusion and Decision Support Services *Mr. Vassilis Papadopoulos, EXUS*
12:25 – 12:40 *Duration: 15 min*	Ethics & societal impact of ANDROMEDA solution Mr. Tuomas Tammilehto, LAU
12:40 – 13:05 *Duration: 20 min* *Q/A: 5 min*	ANDROMEDA highlights, Impact and Results Mr. Alkis Astyakopoulos, KEMEA
13:05 – 13:25 *Duration: 20 min*	Round-table discussion • Benefits from ANDROMEDA project • eCISE as a sharing model • Next day and expectations from ANDROMEDA Moderator: Mr. Dimitris Katsaros Panelists: Mr. Alkis Astyakopoulos Mr. Jesus Hermida (EMSA), FRONTEX, Mr. Franco Oliveri (JRC), Mr. Antonis Kostaridis (STWS)
Lunch break **(1 Hour)**	
14:25 – 14:45 *Duration: 20min* *Q/A: 5 min*	OCEAN2020 Project Mr. Fernando Barbero
14:45 – 15:05 *Duration: 20 min*	COMPASS2020 Project Mr. Nexhat Kapidani



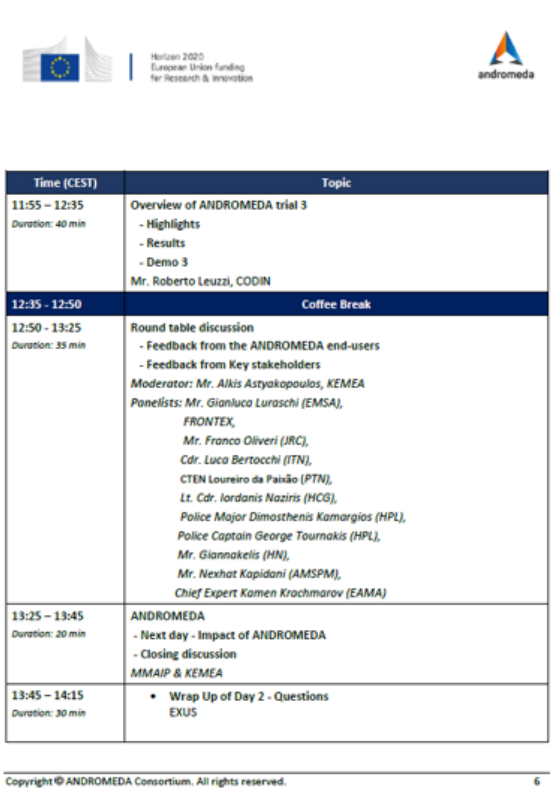
Time (CEST)	Topic
Q/A: 5 min	
15:05 – 15:25 *Duration: 20 min* *Q/A: 5 min*	EFFECTOR Project Cdr. Alexis Blum
15:25 – 15:45 *Duration: 20 min*	Round table discussion - Surveillance systems and challenges - Potential Synergies - technical, operational & business challenges *Moderator: Mr. David Merino, GMV* *Panelists: Mr. Fernando Barbero, OCEAN2020,* *Mr. Nexhat Kapidani, COMPAS2020,* *Cdr. Alexis Blum, EFFECTOR*
15:45 – 16:15	Wrap Up of Day 1 - Questions - Buffer time

Figure 2: Final Workshop & Demonstration Event Agenda (pp. 3-4)



AGENDA - (Thursday 24/6/2021)

Time (CEST)	Topic
Opening Session	
10:00 – 10:10 *Duration: 10 min*	Welcome, Opening of the Trial session Mrs. Athena Foka, MMAIP Mr. Dimitris Myttas, KEMEA
10:10 – 10:15 *Duration: 5 min*	Summary of Day 1 *Mr. Dimitris Katsaros, EXUS*
10:15 – 12:35 ANDROMEDA trials	
10:15 – 10:25 *Duration: 10 min*	ANDROMEDA trials *Mr. Alkis Astyakopoulos, KEMEA*
10:25 – 11:05 *Duration: 40 min*	Overview of ANDROMEDA trial 1 - Highlights - Results - Demo 1 *Mr. Hugo Pinto, INOVAWORKS*
11:05 – 11:55 *Duration: 50 min*	Overview of ANDROMEDA trial 2 - Highlights - Results - Demo 2 *SATWAYS Mr. Marios Moutzouris*



Time (CEST)	Topic
11:55 – 12:35 *Duration: 40 min*	Overview of ANDROMEDA trial 3 - Highlights - Results - Demo 3 Mr. Roberto Leuzzi, CODIN
12:35 - 12:50	**Coffee Break**
12:50 - 13:25 *Duration: 35 min*	Round table discussion - Feedback from the ANDROMEDA end-users - Feedback from Key stakeholders *Moderator: Mr. Alkis Astyakopoulos, KEMEA* *Panelists: Mr. Gianluca Luraschi (EMSA),* *FRONTEX,* *Mr. Franco Oliveri (JRC),* *Cdr. Luca Bertocchi (ITN),* *CTEN Loureiro da Paixão (PTN),* *Lt. Cdr. Iordanis Naziris (HCG),* *Police Major Dimosthenis Kamargios (HPL),* *Police Captain George Tournakis (HPL),* *Mr. Giannakelis (HN),* *Mr. Nexhat Kapidani (AMSPM),* *Chief Expert Kamen Krachmarov (EAMA)*
13:25 – 13:45 *Duration: 20 min*	ANDROMEDA - Next day - Impact of ANDROMEDA - Closing discussion *MMAIP & KEMEA*
13:45 – 14:15 *Duration: 30 min*	• Wrap Up of Day 2 - Questions EXUS

Figure 3: Final Workshop & Demonstration Event Agenda (pp. 3-4)

2.2.1 Final Workshop Day – 23 June 2021

Time	Topic
Opening Session	
10:00 – 10:15 *Duration: 15 min*	**Welcome, Opening of the Workshop** *Mrs. Athena Foka (MMAIP)* *Mr. Pantelis Michalis (KEMEA)* *Mr. Dimitris Katsaros (EXUS)*
10:15 – 10:25 *Duration: 10 min*	**Welcome and introduction by DG-HOME** *Mr. Giulio Mancini*
10:25 – 13:25 **Technical Session, Ethics & societal impact**	
10:25 – 10:50 *Duration: 25 min* *Q/A: 5 min*	**ANDROMEDA's final architecture and its advancements** *Mr. Juan Manuel Grenner (GMV)*
10:50 – 11:15 *Duration: 25 min* *Q/A: 5 min*	**The enhanced CISE and the new opportunities on data sharing** *Mr. Marios Moutzouris (STWS)*
11:15 – 11:45 *Duration: 30 min* *Q/A: 5 min*	**Command and Control systems** *Mr. Marios Moutzouris (STWS)*
11:45 – 12:00 *Duration: 15 min*	**Coffee Break**
12:00 – 12:25 *Duration: 20 min* *Q/A: 5 min*	**Advanced Data Fusion and Decision Support Services** *Mr. Vassilis Papadopoulos (EXUS)*
12:25 – 12:40 *Duration: 15 min*	**Ethics & societal impact of ANDROMEDA solution** *Mr. Tuomas Tammilehto (LAU)*
12:40 – 13:05 *Duration: 20 min* *Q/A: 5 min*	**ANDROMEDA highlights, Impact and Results** *Mr. Alkis Astyakopoulos (KEMEA)*
Lunch Break **(1 Hour)**	
13:05 – 13:25 *Duration: 20 min*	**Round-table discussion** - Benefits from ANDROMEDA project - eCISE as a sharing model - Next day and expectations from ANDROMEDA **Moderator:** *Mr. Dimitris Katsaros (EXUS)* **Panelists:** *Mr. Alkis Astyakopoulos (KEMEA)* *Mr. Jesus Hermida (EMSA),* *FRONTEX,* *Mr. Franco Oliveri (JRC),* *Mr. Antonis Kostaridis (STWS)*
Lunch break (1 Hour)	
14:25 – 14:45	**OCEAN2020 Project**

Time	Topic
Duration: 20min *Q/A: 5 min*	*Mr. Fernando Barbero*
14:45 – 15:05 *Duration: 20 min*	**COMPASS2020 Project** *Mr. Nexhat Kapidani*
15:05 – 15:25 *Duration: 20 min* *Q/A: 5 min*	**EFFECTOR Project** *Cdr. Alexis Blum*
15:25 – 15:45 *Duration: 20 min*	**Round table discussion** - Surveillance systems and challenges - Potential Synergies - technical, operational & business challenges ***Moderator**: Mr. David Merino (GMV)* ***Panelists**:* *Mr. Fernando Barbero (OCEAN2020),* *Mr. Nexhat Kapidani (COMPAS2020),* *Cdr. Alexis Blum (EFFECTOR)*
15:45 – 16:15	**Wrap Up of Day 1 - Questions - Buffer time**

Table 2: Workshop Day Programme

2.2.2 Demonstration Event Day – 24 June 2021

Time	Topic
Opening Session	
10:00 – 10:10 *Duration: 10 min*	**Welcome, Opening of the Trial Session** *Mrs. Athena Foka (MMAIP)* *Mr. Dimitris Myttas, (KEMEA)*
10:10 – 10:15 *Duration: 5 min*	**Summary of Day 1** *Mr. Dimitris Katsaros (EXUS)*
10:15 – 12:35 ANDROMEDA trials	
10:15 – 10:25 *Duration: 10 min*	**ANDROMEDA trials** *Mr. Alkis Astyakopoulos (KEMEA)*
10:25– 11:05 *Duration: 40 min*	**Overview of ANDROMEDA trial 1** **- Highlights** **- Results** **- Demo 1** *Mr. Hugo Pinto (INOVAWORKS)*
11:05 – 11:55 *Duration: 50 min*	**Overview of ANDROMEDA trial 2** **- Highlights** **- Results** **- Demo 2** *Mr. Marios Moutzouris (STWS)*
11:55 – 12:35 *Duration: 40 min*	**Overview of ANDROMEDA trial 3** **- Highlights** **- Results** **- Demo 3**

Time	Topic
	Mr. Roberto Leuzzi (CODIN)
12:35 – 12:50	**Coffee Break**
12:50 – 13:25 *Duration: 35 min*	Round table discussion **- Feedback from the ANDROMEDA end-users** **- Feedback from Key stakeholders** **Moderator:** Mr. Alkis Astyakopoulos (KEMEA) **Panelists:** *Mr. Gianluca Luraschi (EMSA),* *FRONTEX,* *Mr. Franco Oliveri (JRC),* *Cdr. Luca Bertocchi (ITN),* *CTEN Loureiro da Paixão (PTN),* *Lt. Cdr. Iordanis Naziris (HCG),* *Police Major Dimosthenis Kamargios (HPL),* *Police Captain George Tournakis (HPL),* *Mr. Giannakelis (HN),* *Mr. Nexhat Kapidani (AMSPM),* *Chief Expert Kamen Krachmarov (EAMA)*
13:25 – 13:45 *Duration: 20 min*	**ANDROMEDA** **- Next day - Impact of ANDROMEDA** **- Closing discussion** *MMAIP & KEMEA*
13:45 – 14:15 *Duration: 30 min*	**Wrap Up of Day 2 - Questions** *EXUS*

Table 3: Demonstration Event Programme

2.3 Website Announcement

The announcement for the ANDROMEDA Final Workshop and Demonstration Event was made via the main online communication channel, the ANDROMEDA website. A Save-the-Date digital banner was prepared by STWS *(T7.1 leader*) to accompany the announcement. This call-to-action news article invited all stakeholders to register and attend the online event. It included a brief description of event's programme, the registration link, the Save-the-Date digital banner and the Agenda. The table below encloses the content of the website announcement.

Website Announcement content
ANDROMEDA Final Workshop and Demonstration Event - June 23rd-24th, 2021
The ANDROMEDA Final Workshop and Demonstration Event will take place online on June 23rd and 24th, 2021 and is being organised by EXUS, an ANDROMEDA project partner. Further to the presentation of the results achieved, the workshop also aims in initiating stimulating discussions with the Consortium partners, as well as with end-users, practitioners, and policy makers. The first day will start with a technical session, where the participants will have the opportunity to follow presentations on the ANDROMEDA high-level Architecture and its advancements, the enhanced CISE Data Model (e-CISE), the ANDROMEDA Command, Control and Coordination CISE-compatible systems, as well as the Advanced Data Fusion and Decision Support Services. Interesting insights will then be provided by key Stakeholders during the first-round table discussion, that will focus on e-CISE as a sharing model. Next, EU projects will take the floor to present their key results and lessons learnt. The day will close with a round table discussion on Surveillance systems and challenges, led by the coordinators of the EU projects and the end users The Second day of the workshop will focus on Demonstration, and overviews of all the three Andromeda trials will be presented. A round table discussion will follow with feedback from the key stakeholders and the end-users. Please find the agenda here and this link for registration. Your participation will help support An Enhanced Common Information Sharing Environment for Border Command, Control and Coordination Systems! Looking forward to seeing you there!

Figure 4: Announcement on Project's Website - Final Workshop and Demonstration Event

2.4 Leaflet – Final Workshop and Demonstration Event

T7.1 leader, STWS, in order to assist the promotion of the event to a wider audience created a leaflet in digital format dedicated to the ANDROMEDA Final Workshop and Demonstration Event. It included a brief

description of the ANDROMEDA project, an outline of event's programme and the registration link. It was communicated by the consortium to its network and contacts via various online channels for raising the visibility of the event.

Figure 5: Leaflet - Final Workshop & Demonstration Event

2.5 Registration Link

The ANDROMEDA project partner, EXUS was responsible for organizing this two-day event and set up the registration form for participating to it. The registration link was promoted via the ANDROMEDA website, project's social media accounts and the leaflet dedicated to this event. Moreover, the registration link was sent to partners' network via online correspondence. The table below provides the content that was included in the registration form.

Registration Form
Link for registering to the event both day: **https://us02web.zoom.us/webinar/register/WN_dRFBwE_MTg-Sie8EMx01Jg**
ANDROMEDA Final Workshop and Demonstration **Topic** ANDROMEDA - Final Workshop and Demonstration event- 23-24/06/2021 **Description**

Registration Form

ANDROMEDA FINAL WORKSHOP AND DEMONSTRATION EVENT

The ANDROMEDA Final Workshop and Demonstration Event will take place online on June 23rd and 24th, 2021 and is being organised by EXUS, an ANDROMEDA project partner. Further to the presentation of the results achieved, the workshop also aims in initiating stimulating discussions with the Consortium partners, as well as with end-users, practitioners, and policy makers.
The first day will start with a technical session, where the participants will have the opportunity to follow presentations on the ANDROMEDA high-level Architecture and its advancements, the enhanced CISE Data Model (e-CISE), the ANDROMEDA Command, Control and Coordination CISE-compatible systems, as well as the Advanced Data Fusion and Decision Support Services. Interesting insights will then be provided by key Stakeholders during the first-round table discussion, that will focus on e-CISE as a sharing model. Next, EU projects will take the floor to present their key results and lessons learnt. The day will close with a round table discussion on Surveillance systems and challenges, led by the coordinators of the EU projects and the end users.
The Second day of the workshop will focus on Demonstration, and overviews of all the three Andromeda trials will be presented. A round table discussion will follow with feedback from the key stakeholders and the end-users.
Your participation will help support An Enhanced Common Information Sharing Environment for Border Command, Control and Coordination Systems!

Looking forward to seeing you there!

*** Required information**

Time
Jun 23, 2021 11:00 AM

Jun 24, 2021 11:00 AM
Time shows in Athens

- **First Name ***
- **Last Name ***
- **Email Address ***
- **Confirm Email Address ***
- **Country/Region**
- **Organization ***
- **Job Title**

I have read, and I understand the information that has been given to me through the Information Sheet. I agree to participate in ANDROMEDA Workshop & Demonstration day, and I consent to the processing of my personal data for the purposes explained to me YES / NO *****

Information you provide when registering will be shared with the account owner and host and can be used and shared by them in accordance with their Terms and Privacy Policy.

Register

Information Sheet for Participation and Data Processing

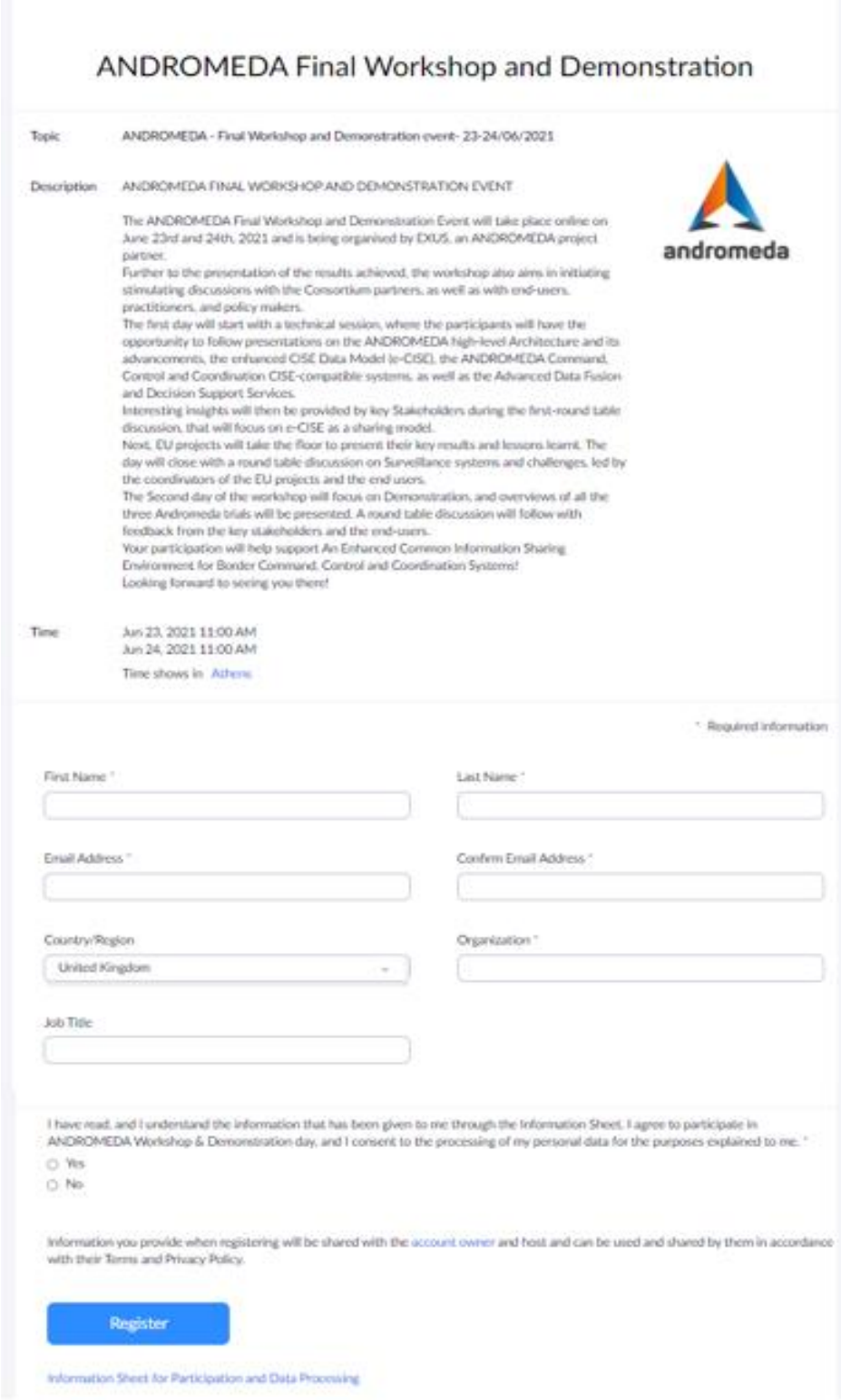


Figure 6: Screenshot from the Registration form

After the registration processes was completed via the respective form, the webinar registration approval screen appeared in order to inform the user that the registration was made successfully.

Webinar Registration Approved

Webinar Registration Approved

Topic
ANDROMEDA - Final Workshop and Demonstration event- 23-24/06/2021

Description
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Time
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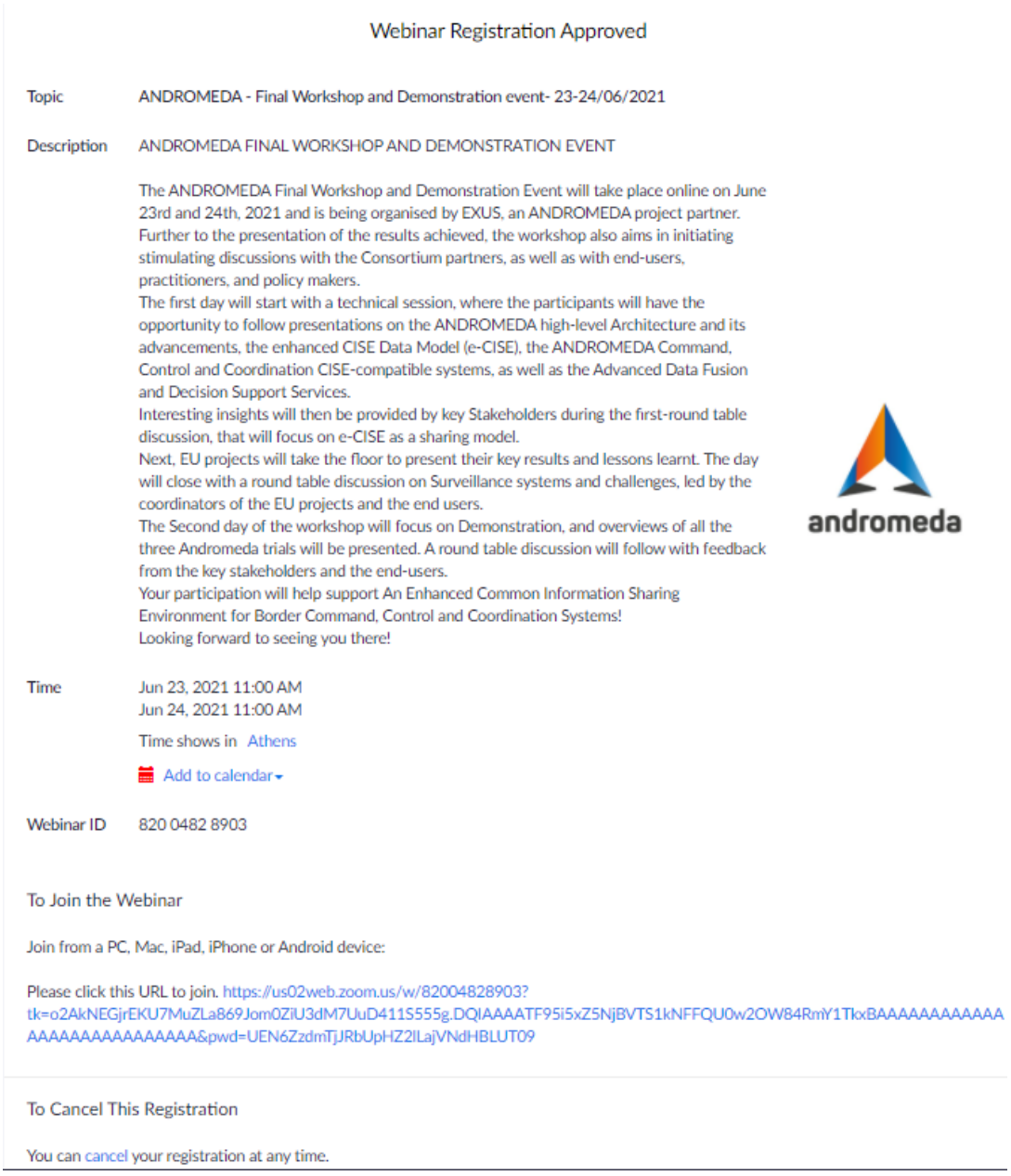
Jun 24, 2021 11:00 AM
Time shows in Athens
Add to calendar
Webinar ID
820 0482 8903



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Looking forward to seeing you there!

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Time Jun 23, 2021 11:00 AM
Jun 24, 2021 11:00 AM
Time shows in Athens
Add to calendar

Webinar ID 820 0482 8903

To Join the Webinar

Join from a PC, Mac, iPad, iPhone or Android device:

Please click this URL to join. https://us02web.zoom.us/w/82004828903?tk=o2AkNEGjrEKU7MuZLa869Jom0ZiU3dM7UuD411S555g.DQIAAAATF95i5xZ5NjBVTS1kNFFQU0w2OW84RmY1TkxBAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA&pwd=UEN6ZzdmTjJRbUpHZ2lLajVNdHBLUT09

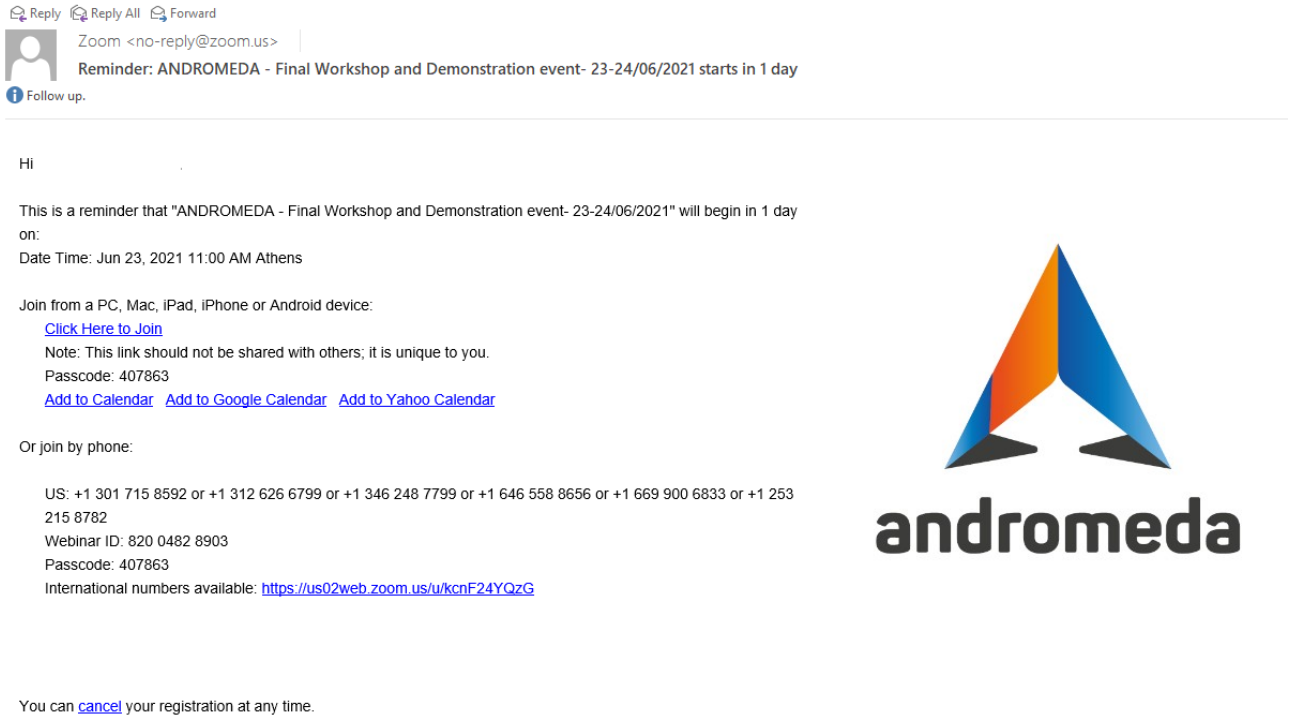
To Cancel This Registration

You can cancel your registration at any time.

Figure 7: Webinar Registration Approved

2.6 Reminder Email *(after registration)*

The organizer of the 2nd Workshop, EXUS, created and sent to all registrants a reminder email one day before the workshop. This email included brief information about the event *(date, time, time zone)* as well as the link to connect with the unique passcode that each registrant had in order to get access to virtually to the workshop. Further information was provided in case of joining by phone. Lastly, an option for canceling the registration was provided to the registration by clicking to the hyperlinked related text.



Reply Reply All Forward

Zoom <no-reply@zoom.us>

Reminder: ANDROMEDA - Final Workshop and Demonstration event- 23-24/06/2021 starts in 1 day

Follow up.

Hi

This is a reminder that "ANDROMEDA - Final Workshop and Demonstration event- 23-24/06/2021" will begin in 1 day on:
Date Time: Jun 23, 2021 11:00 AM Athens

Join from a PC, Mac, iPad, iPhone or Android device:
Click Here to Join
Note: This link should not be shared with others; it is unique to you.
Passcode: 407863
Add to Calendar Add to Google Calendar Add to Yahoo Calendar

Or join by phone:

US: +1 301 715 8592 or +1 312 626 6799 or +1 346 248 7799 or +1 646 558 8656 or +1 669 900 6833 or +1 253 215 8782
Webinar ID: 820 0482 8903
Passcode: 407863
International numbers available: https://us02web.zoom.us/u/kcnF24YQzG

You can cancel your registration at any time.

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Figure 8: Reminder Email

Reminder Email (after registration)
TITLE: Reminder: ANDROMEDA - Final Workshop and Demonstration event- 23-24/06/2021 starts in 1 day Hi <registrants name> This is a reminder that "ANDROMEDA - Final Workshop and Demonstration event- 23-24/06/2021" will begin in 1 day on: Date: Jun 23, 2021 Time: 11:00 AM Athens Join from a PC, Mac, iPad, iPhone or Android device: **Click Here to Join** **Note: This link should not be shared with others; it is unique to you.** **Passcode: XXXX** **Add to Calendar Add to Google Calendar Add to Yahoo Calendar** **Or join by phone:** **US: +1 301 715 8592 or +1 312 626 6799 or +1 346 248 7799 or +1 646 558 8656 or +1 669 900 6833 or +1 253 215 8782**

Reminder Email (after registration)
Webinar ID: 820 0482 8903 **Passcode: 407863** **International numbers available: https://us02web.zoom.us/u/kcnF24YQzG** **You can cancel your registration at any time**

2.7 Information Sheet for Participation and Data Processing

An information sheet for participation and data processing dedicated to the 2nd Workshop was created by KEMEA and included general information about the project, registrants' participation and their rights, treatment of personal data *(in accordance to GDPR)* and consent issues. It was enclosed within the registration form and available for anyone interested in such information.

Information Sheet
Dear attendee, You have been invited to attend and actively take part in the Final Workshop and Demonstration Event of the H2020 EU funded ANDROMEDA research project (GA 833881). The Workshop will be held online on June 23-24, 2021. ***The project in a nutshell:*** ANDROMEDA is a H2020 research project that aims to unlock the full potential of CISE, by validating in a long period of time CISE-compatible command, control and coordination systems from several Coast and Border Agencies. At the same time, it is envisaged to further enhance, validate and demonstrate CISE by extending its scope for land borders and adapting relevant C2 solutions and associated services. This will be accomplished by extending the CISE data model based on the use cases and requirements and adapting state-of-the-art command & control systems for full compliancy with the enhanced model and CISE message exchange patterns. The project architecture will follow a hybrid scheme in order to allow the usage of the End User CISE Nodes/Gateways and at the same time to allow the testing and validation of the extended data model. The project will leverage on the developments, results and experience of the consortium from current and previous research projects (PERSEUS, CloseEye, MARISA, RANGER), from National Procurement projects of CISE Nodes and Adaptors and on the CISE infrastructure of the End Users. This Workshop is carried out in the context of Deliverable D7.7 "Final Workshops Organization and Results" which summarizes the results achieved from the final workshops organized by the ANDROMEDA project. ***Participation:*** Your attendance is totally voluntary. You have the right to refuse entirely or partially to participate and your refusal will not disadvantage you in any way. You are free to withdraw your consent to your participation from any part of the present Workshop at any time, without consequences. In case you have any questions and concerns and for the exercise of your rights related to your participation, you can contact Mr. Alkis Astyakopoulos by sending an email to **a.astyakopoulos@kemea-research.gr**. ***Personal data:***

Information Sheet

During the Workshop your name, image and voice will be processed for the needs of the recording of your presentation.

The processing is based on your consent in accordance with Article 6 (1) (a) GDPR.
The purposes of the recording are i) the preparation and finalization of Deliverable D7.7 "Final Workshops Organization and Results" and ii) the communication of the ANDROMEDA project to the public via its official website and social media accounts.

Your personal data will be retained for as long as it is necessary to fulfil the purposes for which it has been collected and, in any case, no longer than the lifecycle of the ANDROMEDA project. Afterwards, the information will be permanently deleted. With respect to your personal data (image), it might be uploaded on the website and the social media accounts where it will be retained so long as the site and the accounts exist and, in any case, no longer than 3 years after the end of the project.

You have the right to:
- Request information about whether we hold personal information about you, and, if so, what that information is and why we are holding it.

- Request access to your personal information. This enables you to receive a copy of the personal information we hold about you and to check that we are lawfully processing it.

- Request rectification of the personal information that we hold about you. This enables you to have any incomplete or inaccurate information we hold about you corrected.

- Request erasure of your personal information. This enables you to ask us to delete or remove personal information where there is no good reason for us continuing to process it.

- Request the restriction of processing of your personal information. This enables you to ask us to suspend the processing of personal information about you.

- Request transfer of your personal information in an electronic and structured form to you or to another party (right to "data portability"). This enables you to take your data from us in an electronically useable format and to be able to transfer your data to another party in an electronically useable format.

- Lodge a complaint with a supervisory authority (Greek Data Protection Authority http://www.dpa.gr).

- Withdraw your consent at any time. Please note that the withdrawal does not affect the processing of your data which is based on the consent you have given before the withdrawal. Once we have received notification that you have withdrawn your consent, we will no longer process your personal information for the purpose/purposes you originally agreed to.

For the exercise of your rights related to data protection you may contact Mrs. Vasiliki Zomenou who is the DPO of KEMEA by sending an email to dpo@kemea-research.gr or by calling +302107710805 (ext. 384).

Consent:
By actively attending the Workshop you consent to your participation and to the processing of your personal data as explained above. For ensuring that the data processing is based on your consent, you will be also informed orally during the Workshop and your oral consent will be asked.

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INFORMATION SHEET

Dear attendee,

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The Workshop will be held **online** on **June 23-24, 2021.**

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ANDROMEDA is a H2020 research project that aims to unlock the full potential of CISE, by validating in a long period of time CISE-compatible command, control and coordination systems from several Coast and Border Agencies. At the same time, it is envisaged to further enhance, validate and demonstrate CISE by extending its scope for land borders and adapting relevant C2 solutions and associated services. This will be accomplished by extending the CISE data model based on the use cases and requirements and adapting state-of-the-art command & control systems for full compliancy with the enhanced model and CISE message exchange patterns. The project architecture will follow a hybrid scheme in order to allow the usage of the End User CISE Nodes/Gateways and at the same time to allow the testing and validation of the extended data model. The project will leverage on the developments, results and experience of the consortium from current and previous research projects (PERSEUS, CloseEye, MARISA, RANGER), from National Procurement projects of CISE Nodes and Adaptors and on the CISE infrastructure of the End Users.

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Figure 9: Information Sheet

2.8 Social Media Announcements

The ANDROMEDA consortium utilized its social media accounts for promoting the Final Workshop to target audiences. Several posts on ANDROMEDA Twitter and LinkedIn were made from T7.1 leader (STWS) for announcing the date of the event *("save the date")*, the registration link and the programme of the event *(Agenda)*.

Figure 10: Save the Date Announcement on Twitter account

Figure 11: Post on Twitter account about the event's Leaflet

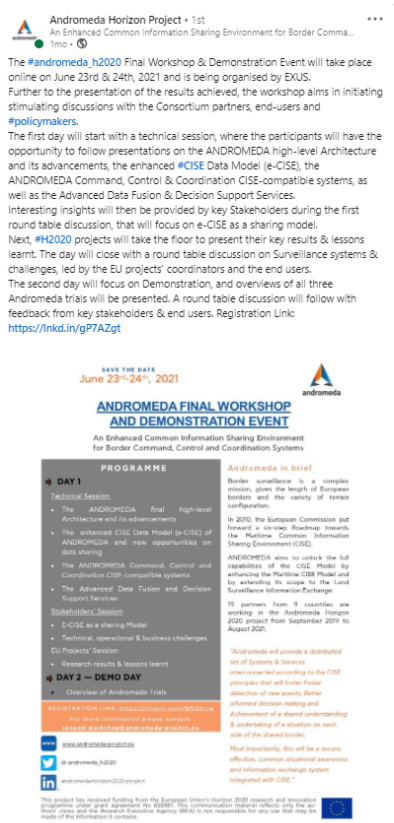

Figure 12: Post on LinkedIn Page promoting event's Leaflet

3. Workshop Results

The second **ANDROMEDA workshop** took place on the 23rd of June 2021 and the **Demonstration Event** the day next, on the 24th of June 2021. These two events - in conjunction - gave the opportunity to ANDROMEDA partners to reveal the project's results and achievements, discuss with experts from the field of maritime and border surveillance, interact with the audience that attended the events by answering their questions, demonstrate the results from the ANDROMEDA trials; and exchange ideas with other EU funded projects in the same domain.

3.1 Attendance

The duration of the **workshop** *(Day 1)* was **6 hours and 36 minutes** *(including 1-hour lunch break)* with **129 attendees** and **97% attendance rate** *(133 registrants)*. The **Demonstration Event** was also held virtually the day after the workshop (*Day 2)*, it was attended by **118 people** and lasted for **4 hours and 52 minutes.** All information presented herein has been extracted by the **Zoom** *(zoom.us)* web tool where both aforementioned events were hosted and broadcasted.

Table 4: Attendance and Registrations

Day	Date	Registrants	Attendees	Avg. Attendance Rate (%)
Day 1	23/06/2021	133	129	97%
Day 2	24/06/2021	133	118	88.7%

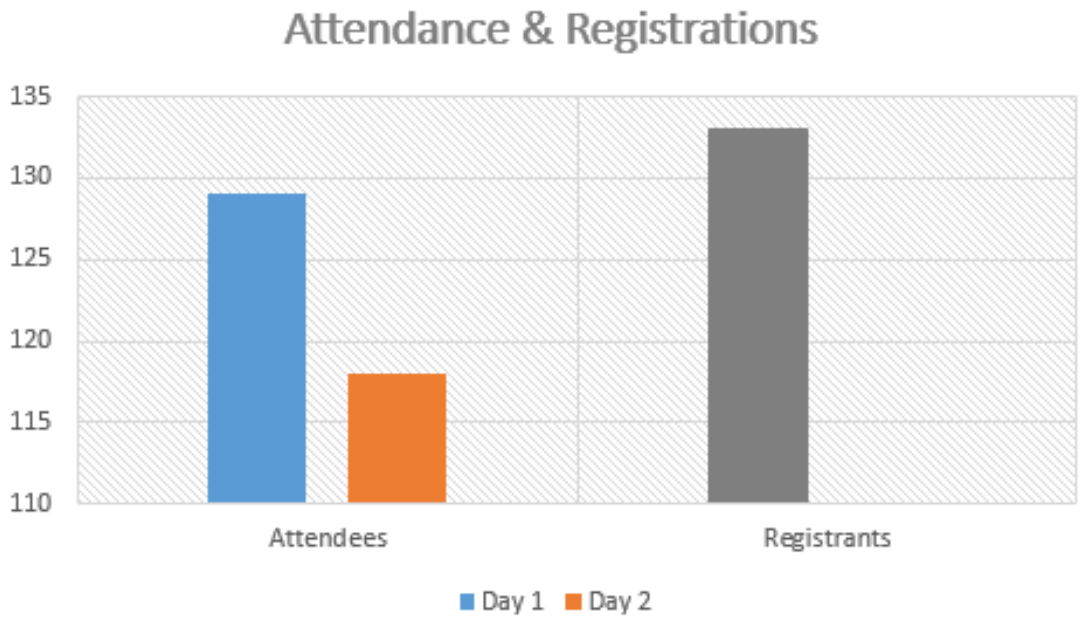

Figure 13: Attendance and Registrations

The success of this online event is depicted on the number of countries stated by the attendees who were watching it from. In detail, the 2nd ANDROMEDA workshop was attended from **21 countries** across the globe ***(14** of them are **EU member states)*** which namely are: *Greece, United States, Spain, Italy, France, Finland, Montenegro, Moldova, Lithuania, Bulgaria, Portugal, The United Kingdom, The Netherlands, Austria, Israel, Poland, Belgium, Cyprus, Hungary, Albania and Turkey.* The **67%** of the attendees watched the event from countries that are **EU member states**, **19%** from countries that are in **European continent** and **14%** countries **across the globe**.

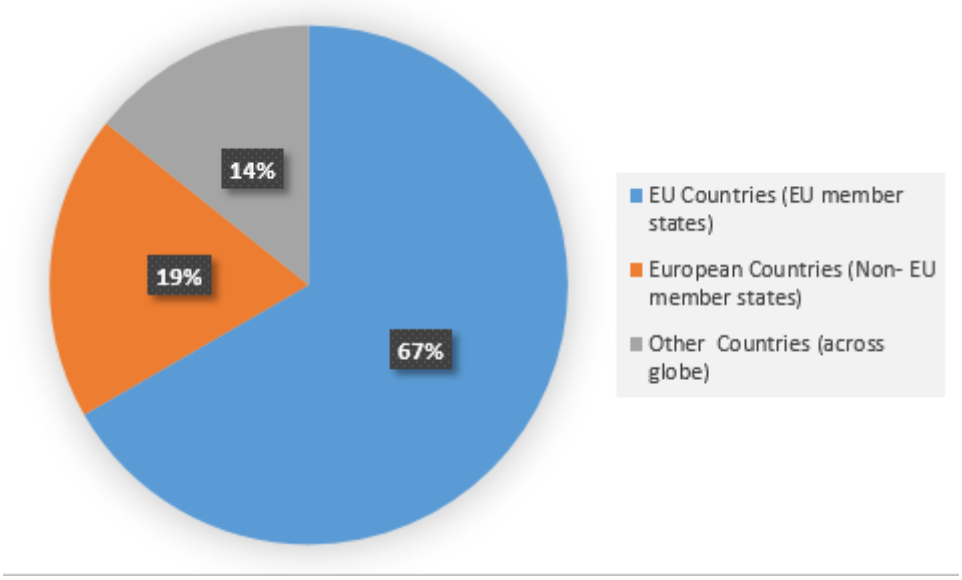

Figure 14: Attendance from EU and non-EU countries

An analysis of the number of attendants per country is provided at the table below. It should be mentioned that no information was available regarding the country for 13 registrants.

Table 5: Number of Attendants per Country

No.	Country	No. of Attendants
1.	Greece	39
2.	United States	5
3.	Spain	9
4.	Italy	9
5.	France	10
6.	Finland	8
7.	Montenegro	4
8.	Moldova	1
9.	Lithuania	2
10.	Bulgaria	5
11.	Portugal	5
12.	The United Kingdom	4
13.	The Netherlands	1
14.	Austria	2
15.	Israel	2
16.	Poland	4

No.	Country	No. of Attendants
17.	Belgium	2
18.	Cyprus	1
19.	Hungary	1
20.	Albania	1
21.	Turkey	1
22.	N/A information	13

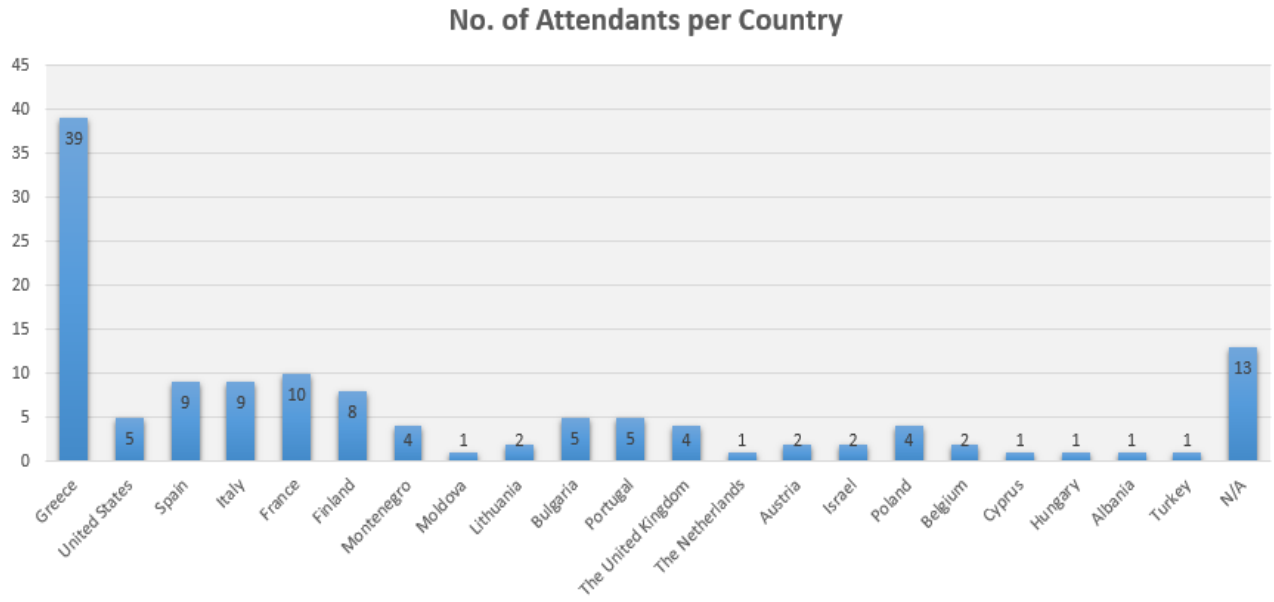

Figure 15: Number of Attendants per Country

3.2 Poll Results

The online tool slido.com was used in order to create the poll and collect attendees' opinion about the event. Due to the increased participation, the interaction with the attendees was facilitated by this online tool which served as a channel in order to express their ideas regarding ANDROMEDA results in real time. The following questions were addressed to attendees.

<u>Question 1 (Q1):</u> How would you rate your overall impression of the ANDROMEDA system?

- *Rate rage of Q1:* 1 star is very low - 5 stars very high
- *Results extracted by slido.com for Q1:* In total, **43 attendees** responded to this question with average **score 4.7**. In detail, the **70%** of the attendees rated **"*5" stars***; **26%** rated **"4" stars** and **3%** rated **"3" stars.**

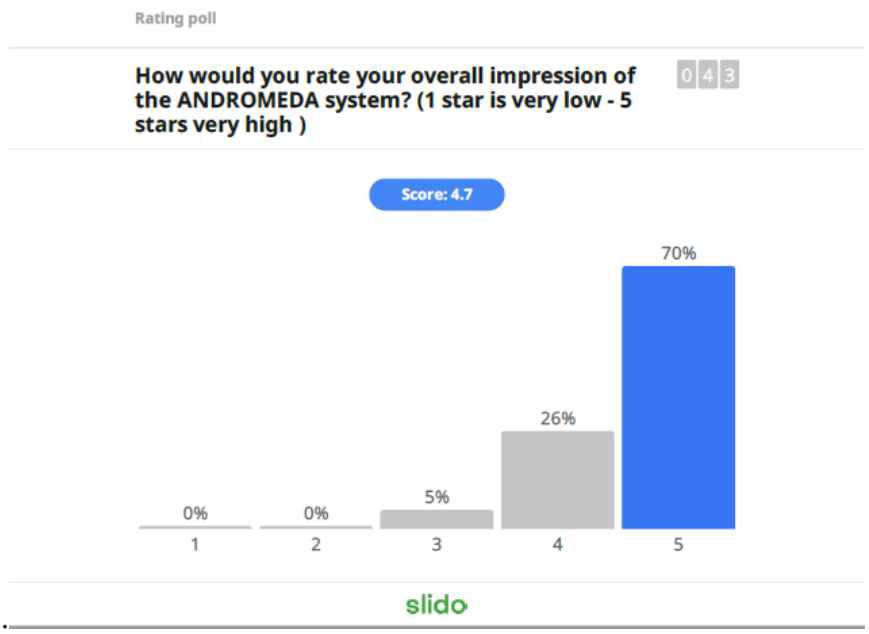

Figure 16: Q1 – How would you rate your overall impressions of the ANDROMEDA system?

<u>Question 2 (Q2):20.</u> According to your experience, how would you rate the importance of a solution like ANDROMEDA for21. the daily operations?

- *Rate rage of Q2:* 1 star is very low - 5 stars very high
- *Results extracted by slido.com for Q2:* In total, **43 attendees** responded to this question with average **score 4.7**. In detail, the **74%** of the attendees rated **"*5*" *stars***; **19%** rated **"4" *stars***, **5%** rated **"3" *stars*** and **2%** rated **"2" *stars*.**

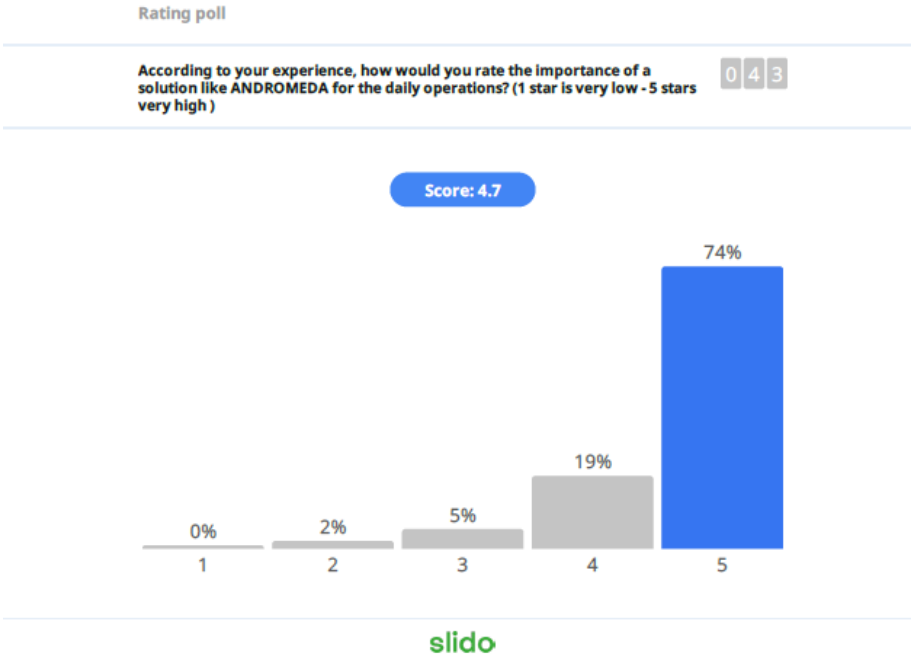

Figure 17: Q2 – According to your experience, how would you rate the importance of a solution like ANDROMEDA for the daily operations?

<u>Question 3 (Q3):</u> How well does ANDROMEDA respond to the maritime/land data sharing challenges?

- *Rate rage of Q3:* 1 star is very low - 5 stars very high
- *Results extracted by slido.com for Q3:* In total, **39 attendees** responded to this question with average **score 4.6**. In detail, the **67%** of the attendees rated **"*5*" *stars***; **31%** rated **"4" *stars*** and **3%** rated **"3" *stars*.**

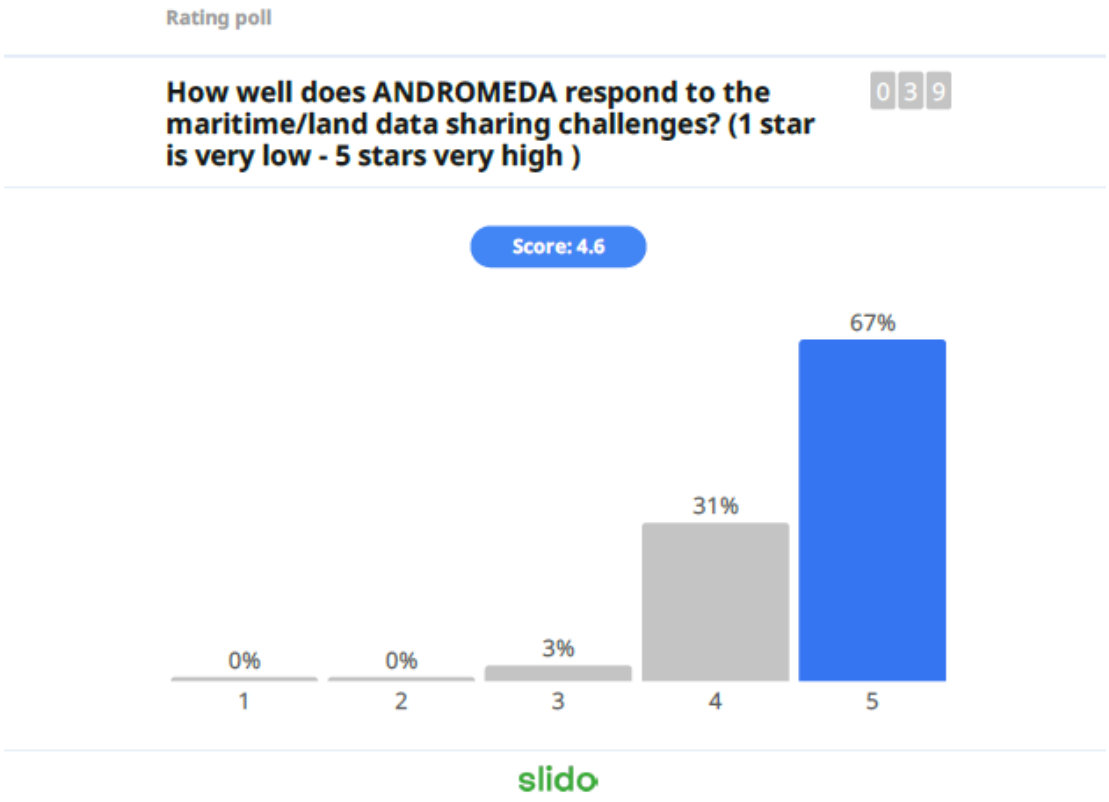

Figure 18: Q3 – How well does ANDROMEDA respond to the maritime/land data sharing challenges?

<u>Question 4 (Q4):</u> Has the ANDROMEDA consortium taken care of Ethics and data protection issues in a sufficient manner?

- *Options for answering Q4:* "Yes", "No" and "Partially"
- *Results extracted by slido.com for Q4:* In total, **41 attendees** responded where **95%** selected **"Yes", 2%** selected **"No"** and **2%** selected **"Partially".**

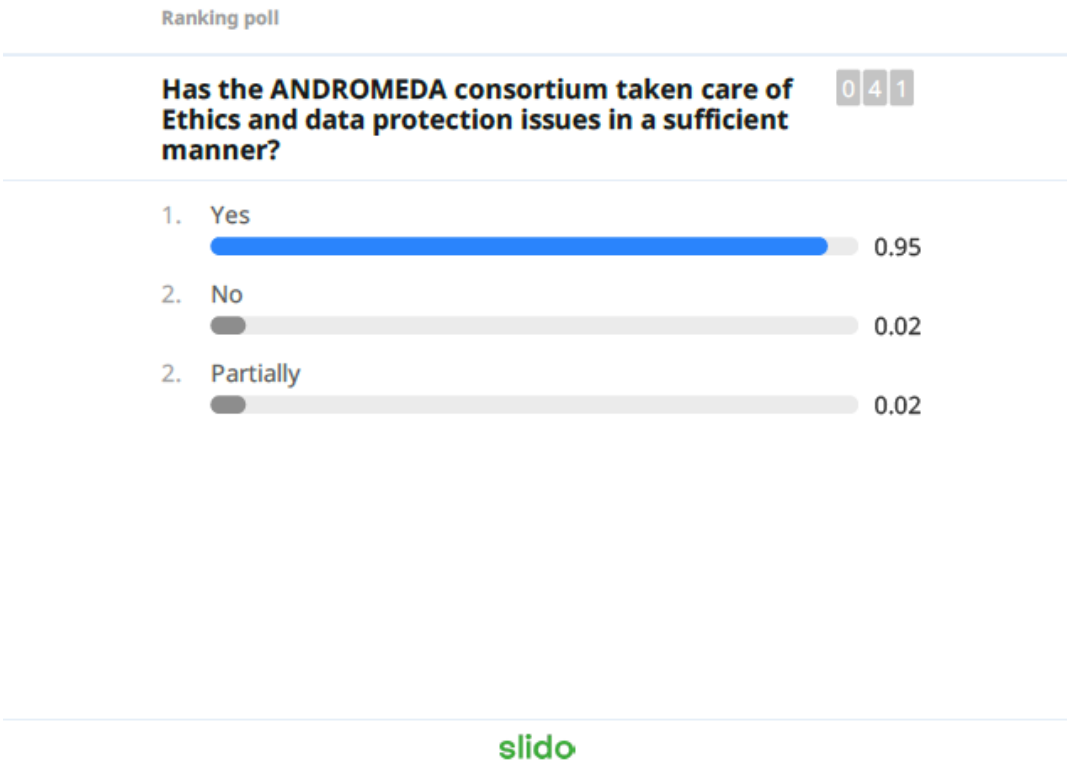

Figure 19: Q4 – Has the ANDROMEDA consortium taken care of Ethics and data protection issues in a sufficient manner?

Question 5 (Q5): Which is the most appealing method for clustering activities?

- *Options for answering Q5 (selection up to 2 options):*
  a. Joint Policy recommendations
  b. Joint Standardization activities
  c. Joint Dissemination/Communication activities
  d. Technical clustering workshops
  e. Joint pilot Demonstrations
  f. Other

- *Results extracted by slido.com for Q5:* In total, **28 attendees** responded by selecting **two options** per each. The most dominant two options were **e. Joint pilot Demonstrations** and **b. Joint Standardization activities**. In detail, the option **e. Joint pilot Demonstrations** was rated **0.86** by the attendees**; b. Joint Standardization activities** was rated **0.75; c. Joint Dissemination / Communication activities** was rated **0.50; d. Technical clustering workshops** was rated **0.46; a. Joint Policy recommendations** was rated **0.43;** and **no responses** received for the option **f. Other.**

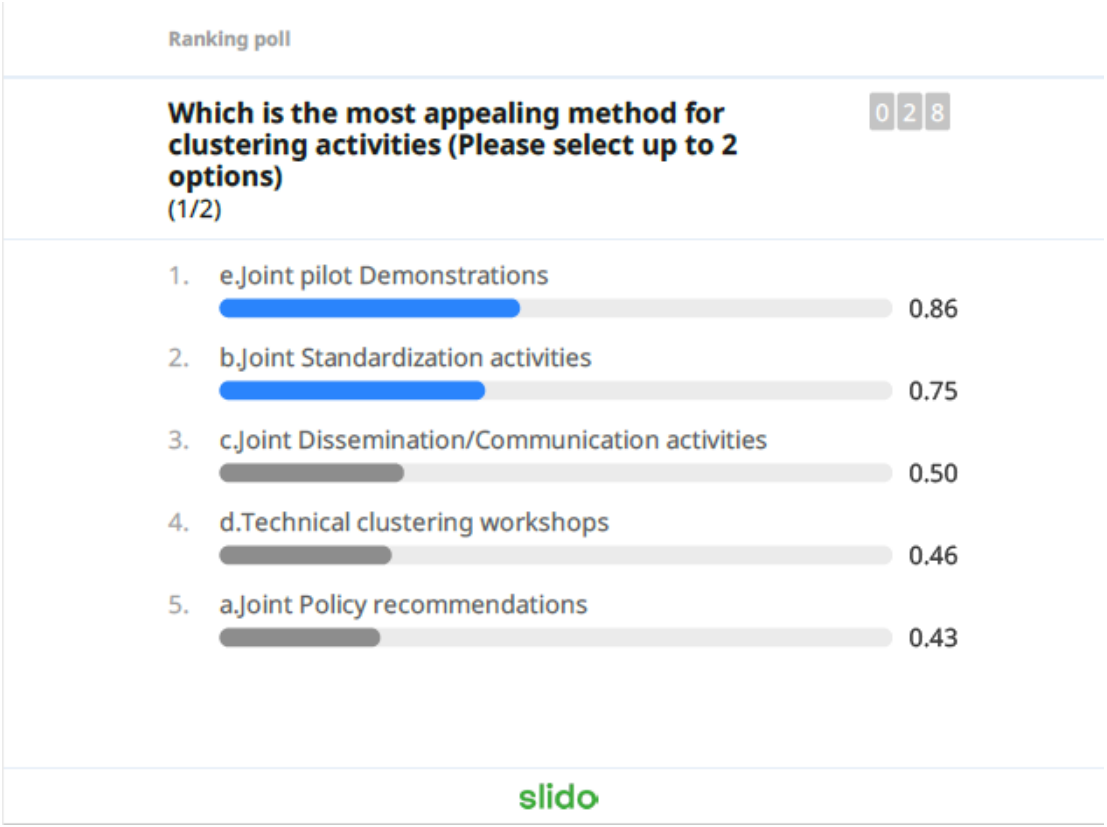

Figure 20: Q5 – Which is the most appealing method for clustering activities? (1/2)

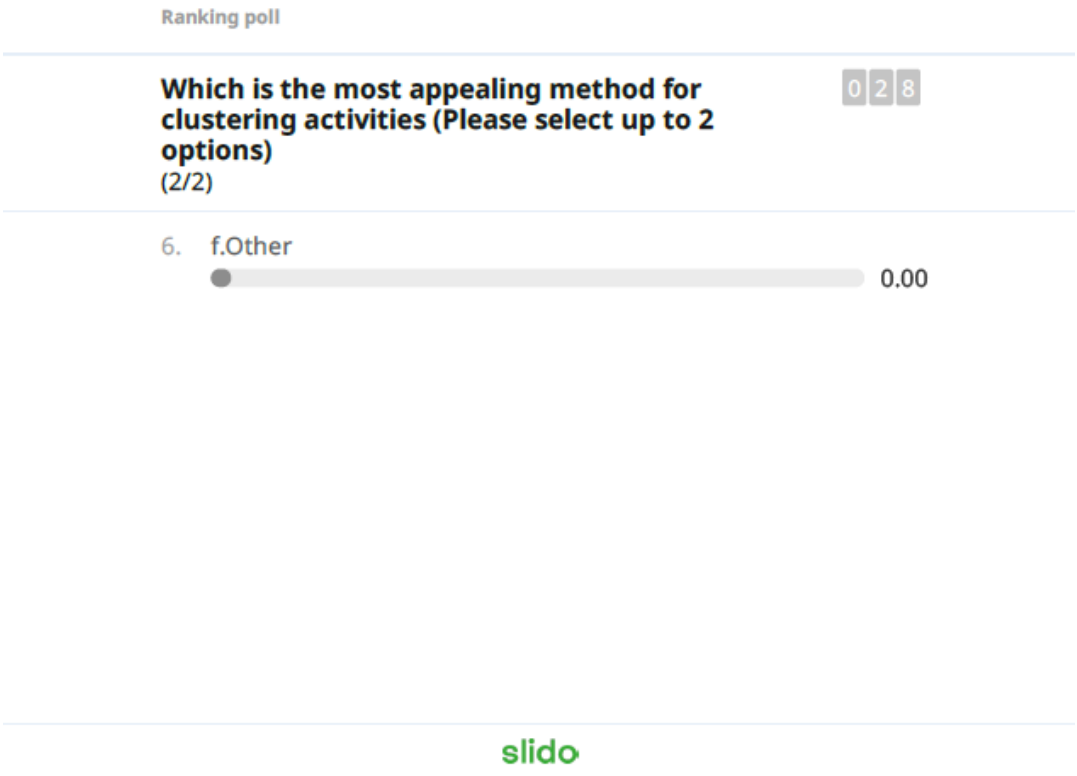

Figure 21: Q5 – Which is the most appealing method for clustering activities? (2/2)

Question 6 (Q6): Which are the most challenging aspects in Border Management projects?

- *Rate rage of Q6 (selection up to 3 options):*
  1. Demonstrations in real environment
  2. Engagement of the end users
  3. Integration activities
  4. Technical implementation
  5. Project duration
  6. Ethical issues
  7. Dissemination/Exploitation aspects
  8. Other

- *Results extracted by slido.com for Q6:* In total, **33 attendees** responded by selecting **three options** per each. The most dominant three options were **Demonstrations in real environment**, **Engagement of the end users** and **Integration activities.** In detail, the option **Demonstrations in real environment** was rated **1.49** by the attendees**; Engagement of the end users** was rated **1.39; Integration activities** was rated **1.36; Technical implementation** was rated **0.79; Project duration** was rated **0.39; Ethical Issues** was rated **0.36**, **Dissemination/ Exploitation aspects** was rated **0.12** and lastly the option **Other** was rated **0.09.**

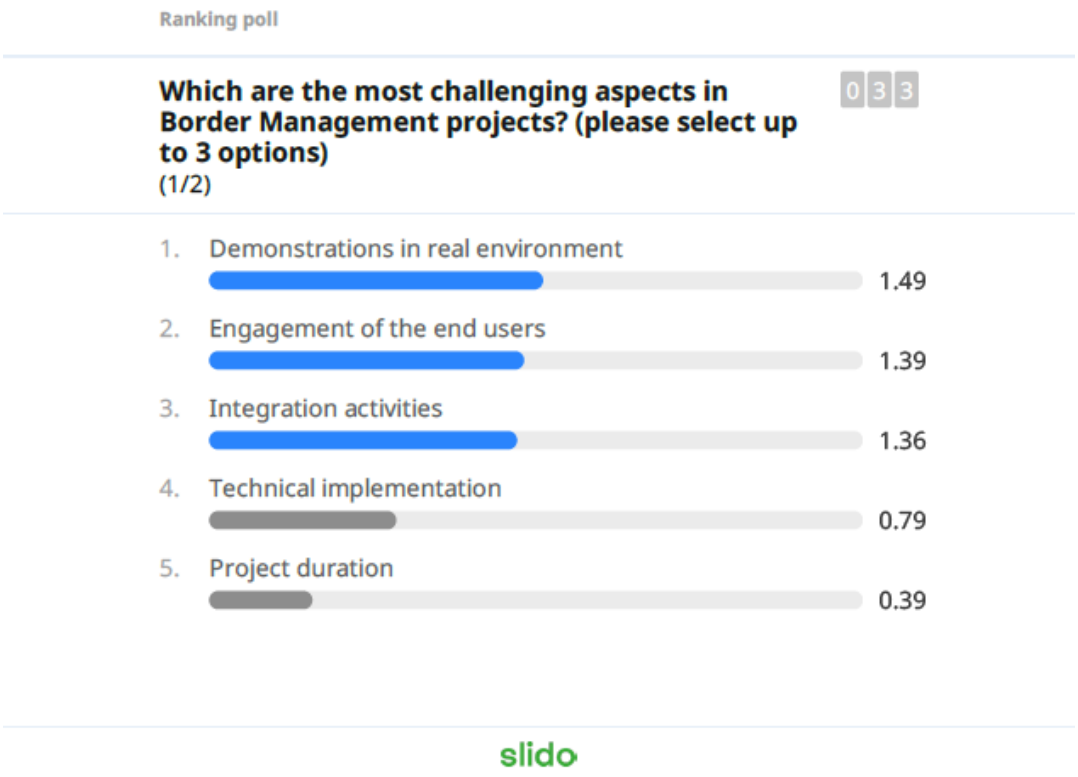

Figure 22: Q6 – Which are the most challenging aspects in Border Management projects? (1/2)

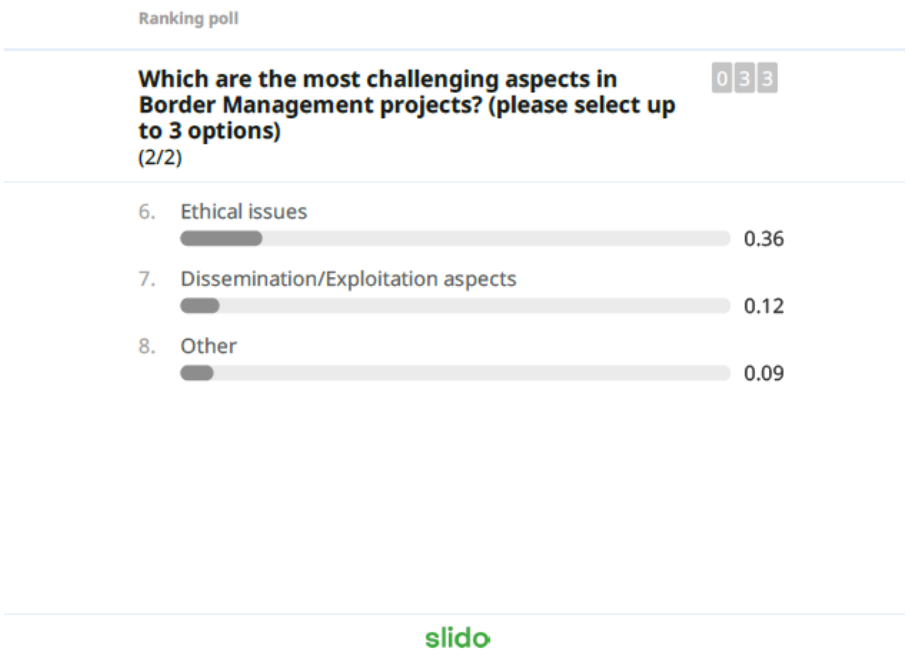

Figure 23: Q6 – Which are the most challenging aspects in Border Management projects? (2/2)

<u>Question 7 (Q7):</u> Do you believe that the active involvement of a large user community in a project, as in ANDROMEDA, could act as a catalyst for its success?

- *Rate rage of Q7:* 1 star is very low - 5 stars very high
- *Results extracted by slido.com for Q7:* In total, **25 attendees** responded to this question with average **score 4.8**. In detail, the **84%** of the attendees rated **"*5" stars***; **12%** rated **"4" stars**, **0%** rated **"3" stars, 4% rated "2" stars** and **no responses** received for the option **"1" star.**

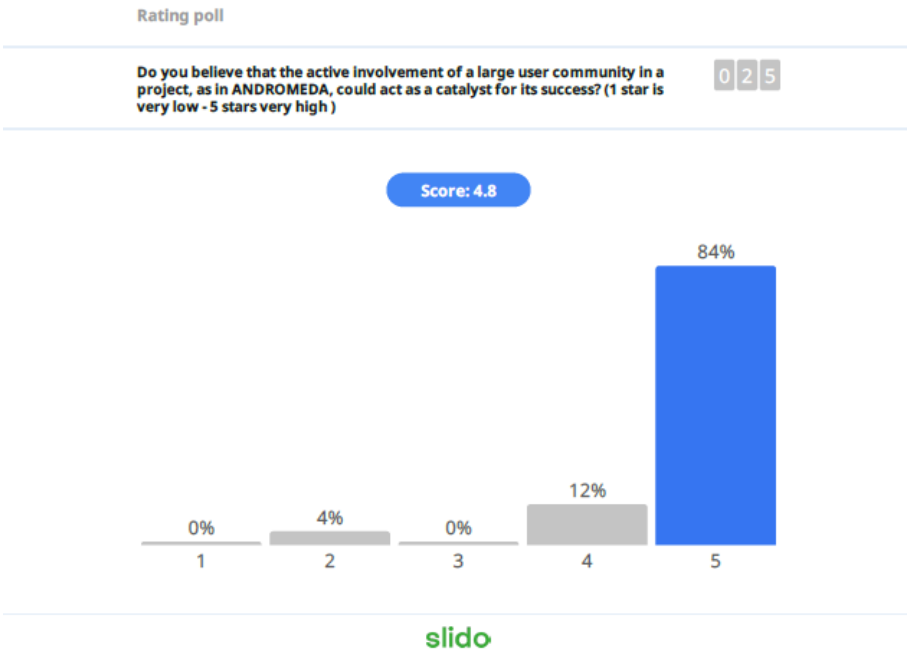

Figure 24: Q7 – Do you believe that the active involvement of a large user community in a project, as in ANDROMEDA, could act as a catalyst for its success?

Question 8 (Q8): Which are the most important "ingredients" for successful demonstrations?

- *Options for answering Q8 (selection up to 2 options):*
  1. Engagement and active participation of the end users
  2. Good collaboration among the technical team and the end users
  3. Pilots and validation under operational conditions
  4. Engagement of external stakeholders and policy makers
  5. Other

- *Results extracted by slido.com for Q8:* In total, **29 attendees** responded by selecting **two options** per each. The most dominant two options were **Engagement and active participation of the end users** and **Good collaboration among the technical team and the end users**. In detail, the option **Engagement and active participation of the end users** was rated **1.10** by the attendees**; Good collaboration among the technical team and the end users** was rated **1.03; Pilots and validation under operational conditions** was rated **0.69; Engagement of external stakeholders and policy makers** was rated **0.17;** and the option **Other** received **no responses**.

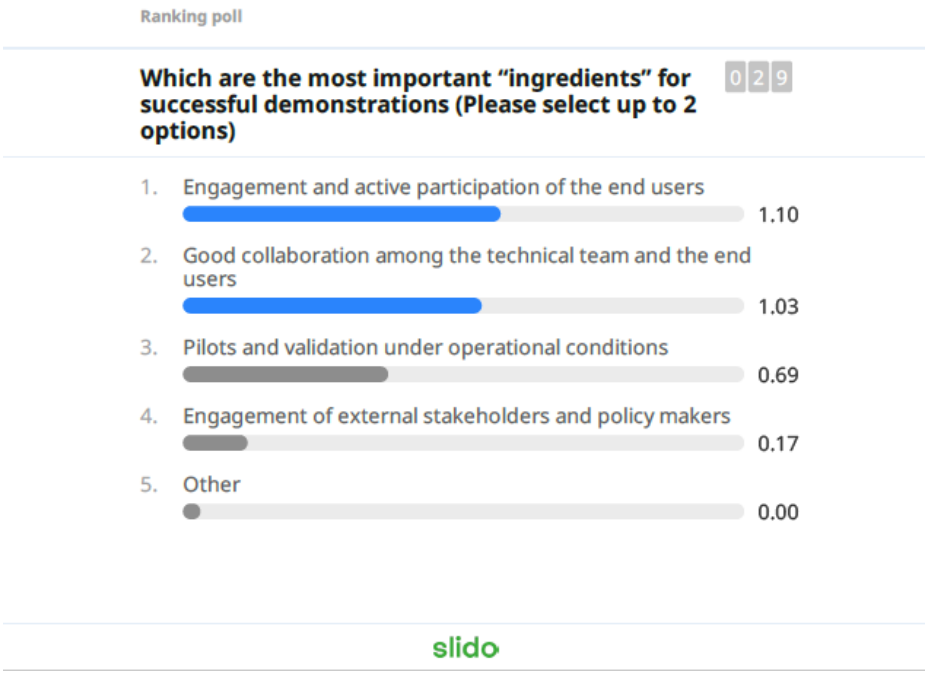

Figure 25: Q8 – Which are the most important "ingredients" for successful demonstrations?

Question 9 (Q9): Having in mind the scope of the ANDROMEDA project, is there any capability or feature that we should further improve?

- *Word cloud poll:* Attendees are free to write the word that better express their opinion
- *Results extracted by slido.com for Q9:* In total, **19 attendees** responded while the most dominant words were **"big data"** and **"AI".** Other answers that were provided during Q9 were: *ABM, Drifting Models; Sla for data exchange; Satellite tracking; AI and big data analytics; mobile software - application solutions; Cross-sectoral data model convergence; Satellite based target detections; more legacy systems; Search and Rescue prediction model; Common, simplified operation abilities; Further Data analysis tools; data and service models; operational cooperation; video analytics.*

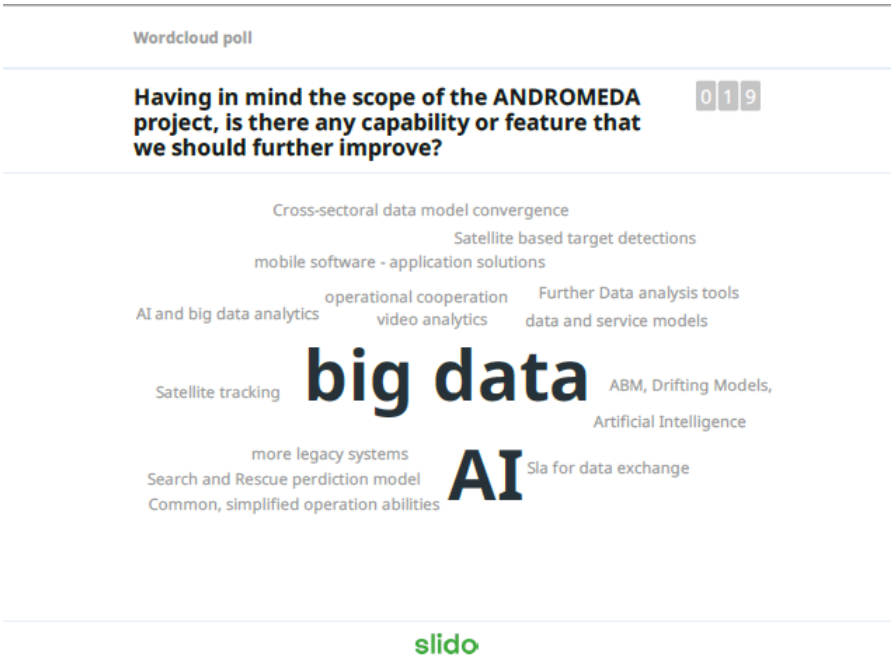

Figure 26: Q9 – Having in mind the scope of the ANDROMEDA project, is there any capability or feature that we should further improve?

<u>Question 9 (Q10):</u> Please describe in one word/phrase the outcomes of the ANDROMEDA project

- *Word cloud poll:* Attendees are free to write the word that better express their opinion
- *Results extracted by slido.com for Q10:* In total, **23 attendees** responded while the most dominant word/phrase was **"cooperation".** Other answers provided were "Promising"; "data sharing", "Excellent!"; "successful" and many other.

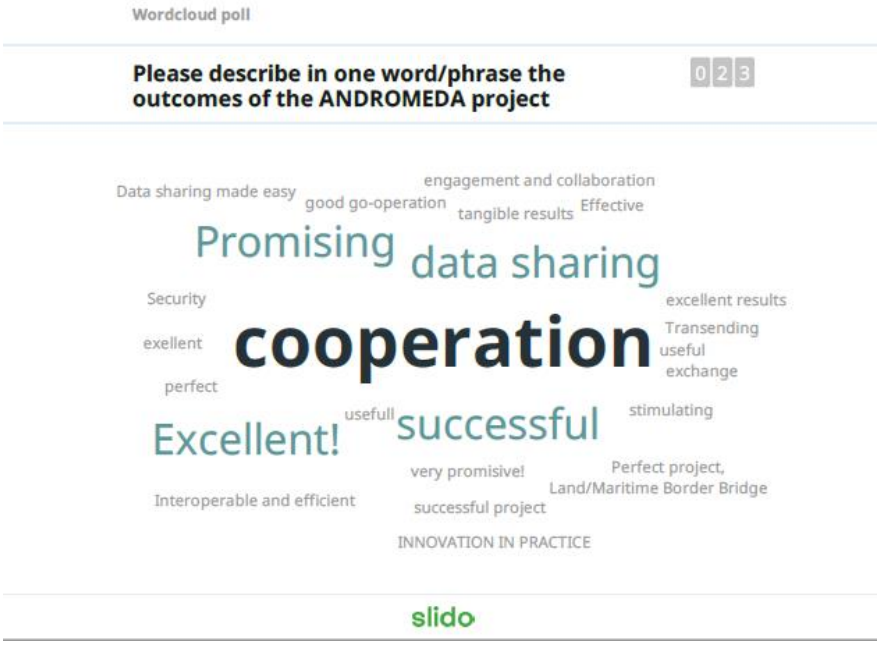

Figure 27: Q10 – Please describe in one word/phrase the outcomes of the ANDROMEDA project

3.3 Workshop Presentations and Discussions (23rd June 2021)

3.3.1 Opening Session

The **2nd ANDROMEDA workshop** held on the 23rd of June 2021, was opened by **Mr. Dimitris Katsaros** from EXUS and later on **Mrs. Athina Foka** from the Hellenic Ministry of Maritime Affairs and Insular Policy *(MMAIP)* welcomed the speakers and the attendees. Lastly, in this introductory session **Mr. Pantelis Michalis** from KEMEA gave a brief description of project's key achievements and welcomed the audience.

Figure 28: Mr. Dimitris Katsaros (EXUS) while opening the Workshop

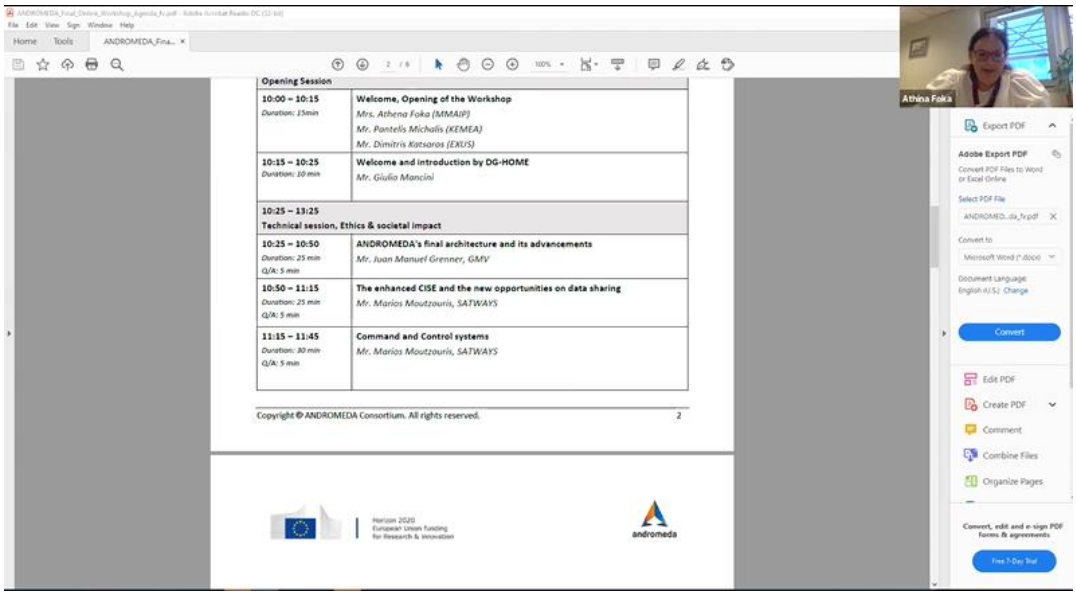

Figure 29: Mrs. Athina Foka (MMAIP) while welcoming speakers and attendees

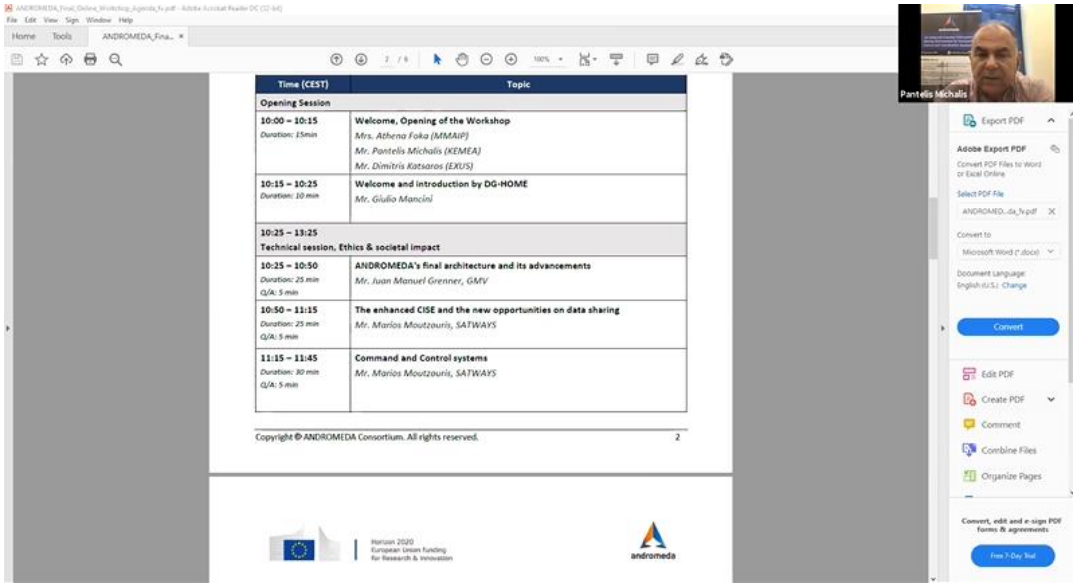

Figure 30: Mr. Pantelis Michalis (KEMEA) while welcoming speakers and attendees

Our invited speaker from DG-HOME, **Mr. Giulio Mancini** also welcomed speakers and audience. Moreover, he expressed the interest of DG-Home in the ANDROMEDA project and overall to the EU border and external security innovation area.

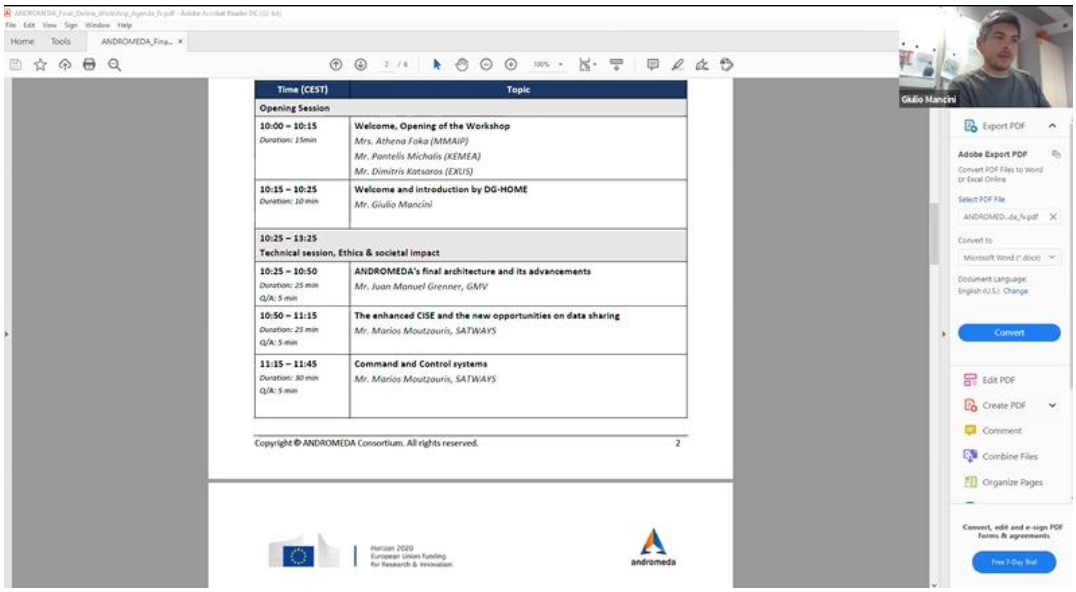

Figure 31: Mr. Giulio Mancini (DG-HOME) while welcoming speakers and attendees

3.3.2 Technical Session, Ethics & Societal Impact

In this session technical results of the project were showcased and topics about ethics and societal impact were presented. The whole session was moderated by **Mr. Dimitris Katsaros** from EXUS.

The **first presentation** was made by **Mr. Juan Manuel Grenner** *(GMV)* who talked about ANDROMEDA's system final architecture and its advancements. The operation context of the ANDROMEDA architecture is depicted in **Figure 32** which shows how C2 Systems *(LCC & MCC)* are connected within the Theatre of Operations in a common network *(the ANDROMEDA Network)*. The assets depicted range from the Radar and

AIS Coastal Stations to Surveillance Drones. In the same way it can be seen that additional elements as a Global Decision Support Tool joins to the whole picture. Each of these systems gather data and information from its different assets and sensors in order to procure an improved Situational Awareness to the *(Land and Maritime)* Border Control Authorities. The objectives of the architecture serve the following aspects which are: the standardized approach - *NATO Architecture Framework*; it aligned with CISE Architecture; secured communications *(VPN);* privacy by design *(e.g. Data Protection);* scalable environment which means easy to add new services to the Nodes *(Use of Micro-Services) and* easy to deploy and integrate new Nodes to the Network *(Virtualization).*

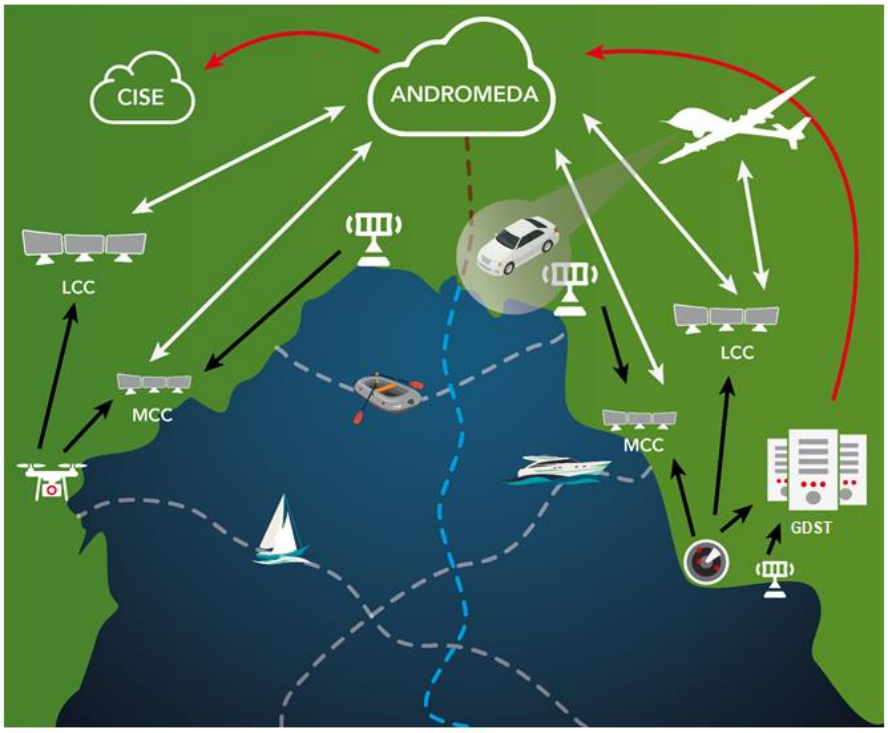

Figure 32: ANDROMEDA's system Architecture – presentation made by Mr. Juan Manuel Grenner (GMV)

Later on, **Mr. Grenner** presented the four design principles of the system's architecture which are:

1. Define a system–of–systems where the exchange of information is based in the use of the enhanced-CISE Model.
2. Couple the use of advanced Data Fusion Systems and Decision Support Tools to C2 Systems.
3. Embed these advanced services and C2 systems into the currently operating Legacy Systems.
4. Interconnect different Legacy Systems in a unique network through the use of e-CISE Data Model, and how this e-CISE Data Model based exchange of information could be connected to CISE Network.

The architecture deployment was based on a software stack composed by technologies that facilitate the virtualization mechanism and was designed in a way to de deployed on any environment easily, quickly and reliably. Each component had two parts: an auto-deployable software piece that can be started in minutes and a simple configuration to indicate the communications of the component. A complete ANDROMEDA Node can be deployed in less than a day.

The **second presentation** was made by **Mr. Spyros Antonopoulos** (*STWS)* who talked about the enhanced CISE and the new opportunities on data sharing. The e-CISE was fully implemented in Command and Control Systems *(4 different ones),* Data Fusion Services, Decision Support Tools and Simulated e-CISE Node

Network *(Andromeda Hub*). It was validated in three *(long lasting)* trials where **two** of them were **Maritime** and **one Hybrid** *(Land & Maritime)*. Later on Mr. Antonopoulos explained the reasons about extending its scope in the Land Border domain which are:

- Lack of existing standard for interoperability in Land Border Surveillance and Operations Coordination.
- The CISE Data Model object oriented design allows to be extended "easily" in this domain.
- Border operations often require the cooperation between maritime and land border organizations
- Re-usability of technologies and infrastructures to serve additional domains will result in costs savings.

e-CISE Data Model is the enhanced Common Information Sharing Environment Data Model as designed for Andromeda. It provides the protocol and means for information sharing among Andromeda systems *(C2s, Data Fusion Services and Decision Support Tools)* and it is based on the CISE principles and architecture. The e-CISE Data Model inherits and extends the Maritime domain specific entities of the CISE Data Model and introduces new entities for the Land Surveillance operations domain.

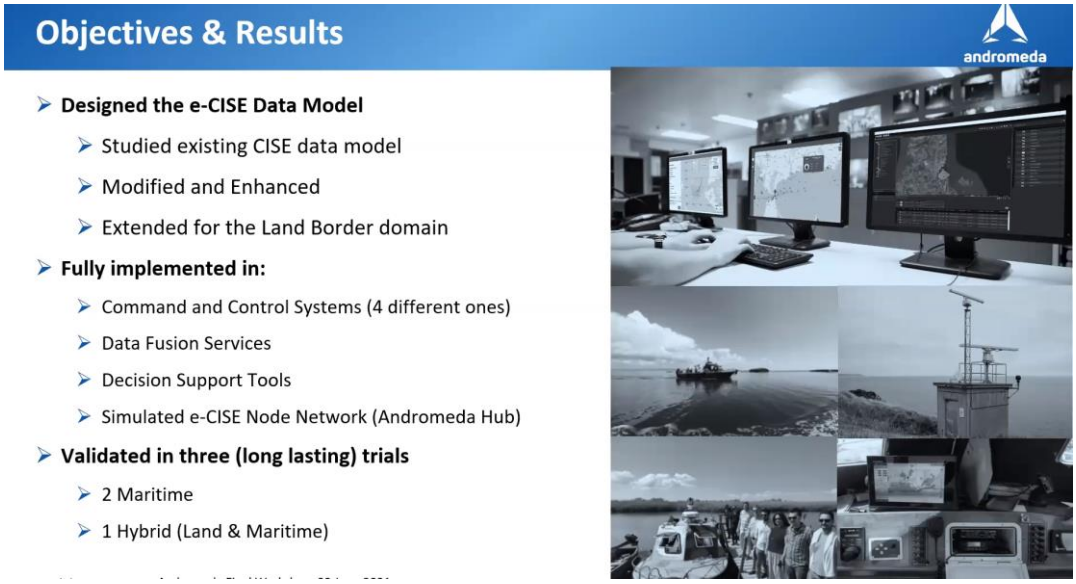

Figure 33: "The enhanced CISE and the new opportunities on data sharing" presentation made by Mr. Spyros Antonopoulos (STWS)

At a glance, the **e-CISE Data Model** introduces **Mission, Task, Operation** entities in order to support most **Land Border Surveillance** activities. It provides richer set of vessel types and expresses more than 100 land and maritime anomaly types with advanced features. Moreover, it defines the information exchange model of Data Fusion and Decision Support services and also it provides sensor vocabulary with advanced spatiotemporal expression capabilities. Lastly, it supports:

- fused entities by providing correlation mechanism of the fusion process counterpart entities;
- object classification and detection capabilities; and
- more Geometry types.

Mr. Antonopoulos while closing his presentation mentioned that e-CISE as presented, aims to enhance the CISE Data Model *(Maritime domain)* and introduces new entities to support the Land Border domain. The current version of the e-CISE schema is v2.2.1 and it is licensed as Attribution-Share Alike *(CC BY-SA)*. This license lets other remix, tweak, and build upon it even for commercial purposes, as long as they credit the

Andromeda & EUCISE2020 Consortium, and license their new creations under the identical term. The e-CISE is available for download at the Andromeda Website *(Documentation and XML Schema).*

The **third presentation** was led by **Dr. Marios Moutzouris** *(STWS)* who gave an overview about Command and Control systems. The system has a number of responsibilities *(number of things to be able to do)*, needs to be able to "speak" a language, driven by user requirements and needs certain operation domains. So, sharing is imperative to enable a common operational picture between national agencies and neighboring agencies. The e-CISE dictates how communication occurs between agencies and what data needs to be captured and provided. The Andromeda system has full compatibility with CISE/eCISE service/data model. The adaptors developed for each C2 are able to connect to the Andromeda HUB. Later on, **Mr. Juan Manuel Grenner** *(GMV)* continued the presentation for C2s and talked about **Socrates C2** from GMV which offers a complete Command and Control System that allows surveillance, tasking, mission planning, video streaming capabilities and reporting. Additionally, it is integrated with Behaviour Analysis systems through rule definitions and with Decision Support Tools for an improved operational decision-making process. All these capabilities are compliant with the enhanced CISE Data Model, allowing the users of the different connected C2's to interact with each other. Socrates C2 was tested and demonstrated during the Ionian Adriatic Trial, acting as the C2 for the Montenegro Node.

Figure 34: Mr. Juan Manuel Grenner (GMV) while presenting Socrates C2

Dr. Moutzouris *(STWS)* briefly described ENGAGE from SATWAYS which is a Command, Control and Coordination system for Security and Defence. It integrates information from multiple, diverse systems into a single command environment, and coordinates a response plan based on real-time data. ENGAGE's unified management approach tackles the complete lifecycle of incident capture, response *(mission, task, dispatch mobile)*, resolution *(field reports)* and recovery. It is deployed at HCG, HN, HP for GR-BG and Ionian-Adriatic Trials.

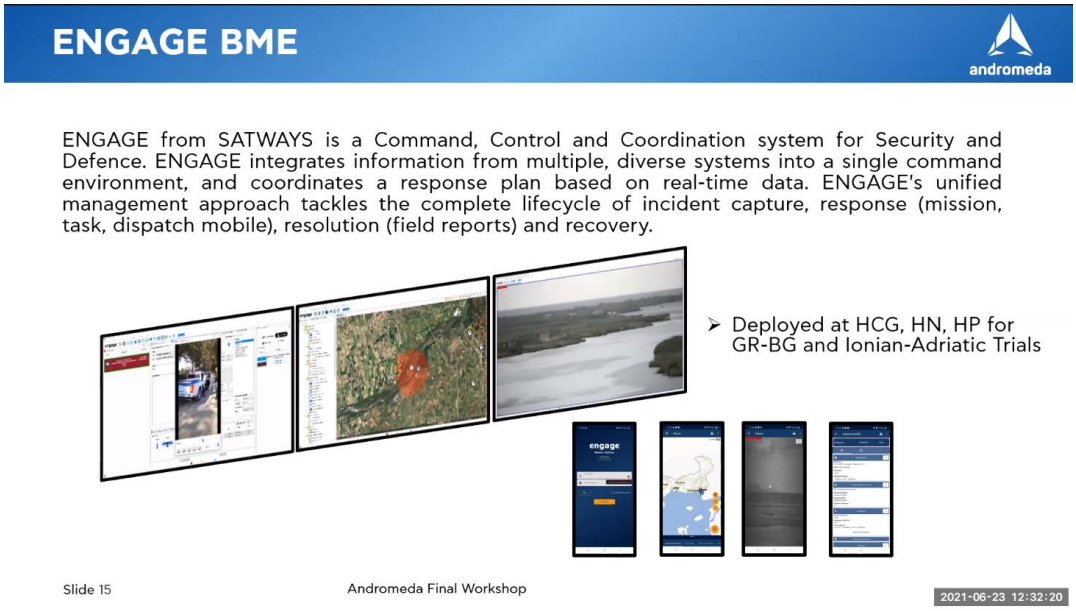

Figure 35: Dr. Marios Moutzouris (STWS) while presenting ENGAGE

In continuation of C2s presentation, **Mr. Hugo Pinto** *(INV)* showcased **GeoC2**. It is an open standard, highly interoperable, high performance command and control software solution suite from Inovaworks, that allows organizations to:

- ingest massive amounts of structured and unstructured geospatial information,
- turn it into a Consolidated Operational Picture that mimics as close as possible to Field Truth,
- analyse it in real time looking for interesting and relevant trends and/or abnormal behaviour,
- select actionable events and triage them through a decision-support pipeline,
- suggest and plan operational missions to address those actionable events,
- instantiate, deploy and monitor the execution of such missions.

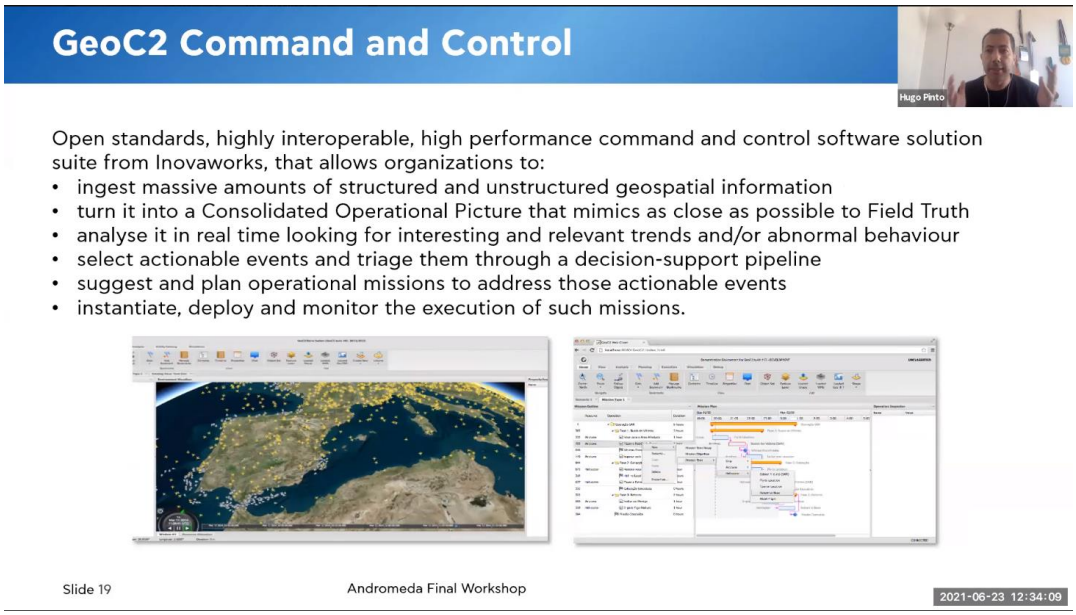

Figure 36: Mr. Hugo Pinto (INV) while presenting GeoC2

Lastly, **Mr. Giuseppe Vella** (ENG) talked about the **SMART C2** from ENG which has the following capabilities:

- provide a comprehensive maritime operational picture, based on networks of sensors sites and centers *(local, regional, etc.),*
- integrate data acquired form a number of heterogeneous organisations,
- provide full coverage of the area of interest with a wide choice of platforms (*coastal, airborne, satellite, etc.)* depending on operational requirements,
- correlation with intelligence data,
- abnormal behavior detection to support operators,
- integration of assets *(patrol boats, helicopters, aircrafts, etc.),*
- improved resource allocation for greater efficiency and cost savings,

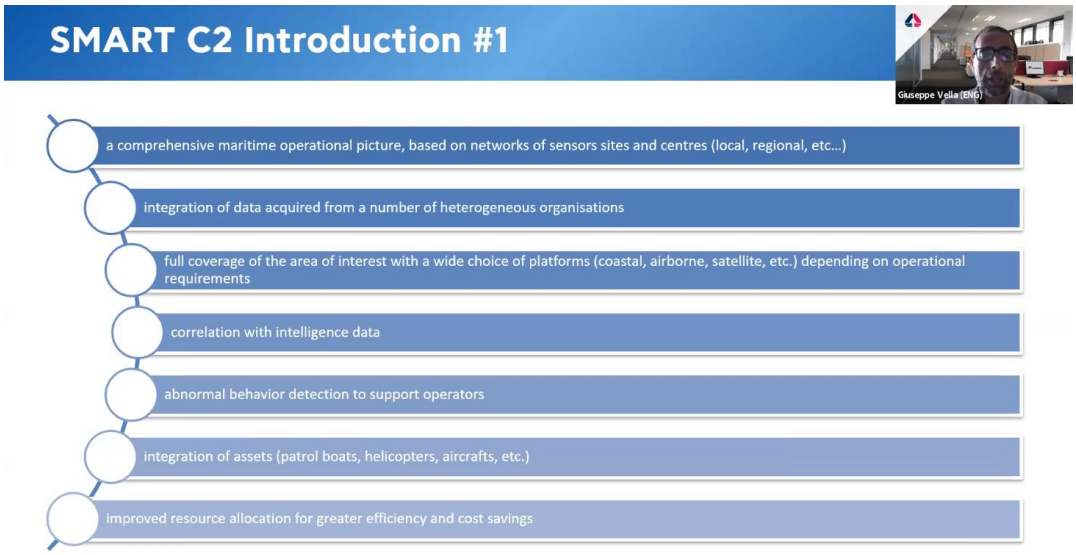

Figure 37: Mr. Giuseppe Vella (ENG) while presenting SMART C2

The **fourth presentation** entitled "Advanced Data Fusion and Decision Support Services" was led by **Mr. Vasilis Papadopoulos** *(EXUS)* who talked about Data Fusion Services. The **Early Warning System** covered Data Fusion for Threat Assessment layer based on JDL model. The **TRITON** *(Abnormal Behavior Engine)* is a service from SATWAYS, which processes data in real-time (vessels - from any source, land vehicles or persons) and provides a fast response for any suspected behaviours. Rules are configured by the operator in both maritime and land domains to detect over 30 suspicious behaviours. Ancillary databases are also used such as weather, vessel routes and vessel information stores to provide additional input into determining whether the behaviour of an object matches a certain pattern. It supports also the combination of rules, e.g. abnormal course change and AIS signal lost. Alerts can be triggered if one of rules are triggered or only when both are triggered. About **SOCRATES DF**, GMV is responsible for the fusion of the different tracks that will be injected into the systems, allowing that a same track that is detected by multiple sensors can be shown to the user as a unique track with combined information. This service brings ANDROMEDA a solid starting point to analyze the maritime and land traffic and taking decisions from this point. Lastly regarding Lastly, the **GeoC2 Real Time Analytics Module** takes AIS tracks as input and process them to detect and classify which abnormal tracks exist, and the behaviour *(from a set of pre-catalogued behaviour sets such as "hard breaking", "sudden route change", "rendez vous", etc.)* triggered by their recent performance, using time series geospatial analysis and unsupervised pattern detection. The system evaluates:

- the position and recurrence of a given track path;
- a behavioural classification of that the vessel appears to be doing;
- the degree to which a given set of tracks is deviating from the expected behaviour at the location or temporal recurrence of their expected normal;

Maritime Situational Awareness operators can then use the GeoC2 Real Time Analytics service to readily assess and triage large-scale maritime situational pictures, allowing them to focus on the *(hopefully)* few interesting vessels with potentially abnormal behaviours, instead of the large-scale picture with mostly normal traffic.

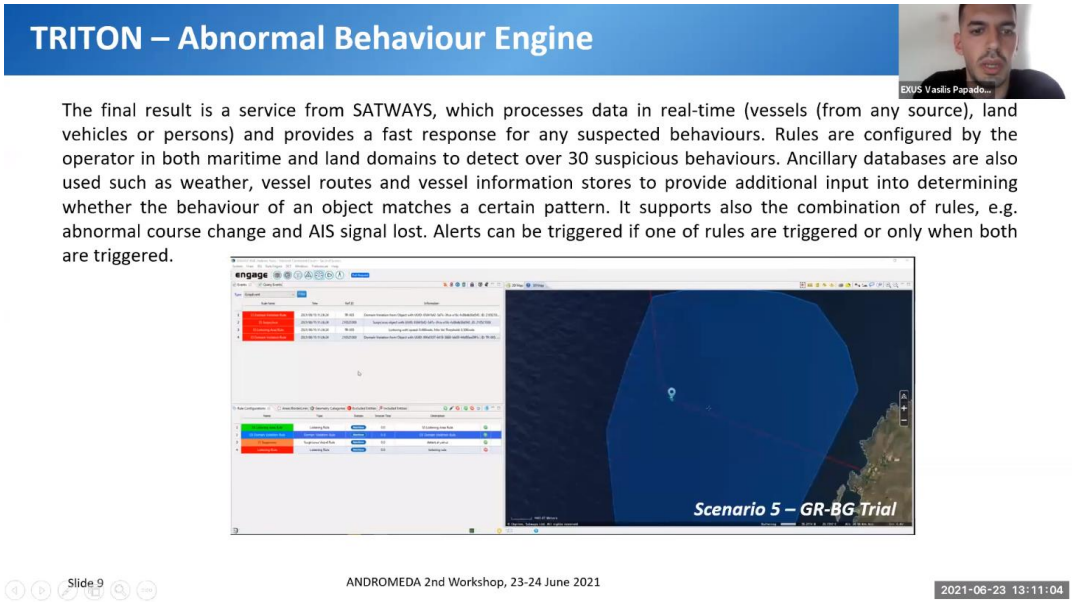

Figure 38: Mr. Vasilis Papadopoulos (EXUS) while talking about Data Fusion Services

Later on, the **ICCS Intelligent UxV Surveillance Platform** *(INUS)* was presented by an ICCS researcher who talked about the ANDROMEDA Land Border use case scenarios for targeted surveillance missions. In brief, INUS is consisted of: **Surveillance assets** *(aerial unmanned platform and terrestrial surveillance systems);* the **UAV pilot's workstation**; and the **Intelligence Officer's workstation**. The aerial platform is operated by certified UAV pilot and an operator *(officer).* The platform shares real-time information with the Command and Control Centre and provides enhanced situational awareness

Mr. Giovanni Coppini *(CMCC*) continued this presentation by talking about Decision Support Systems i.e. **WITOIL**, **VISIR** and **OCEAN-SAR. VISIR** is a service providing optimized nautical routes in the Mediterranean Sea. The optimization regards total navigation time, taking into account safety of navigation. Using **OCEAN-SAR** to simulate the possible trajectories of persons or objects lost at sea allows a better prioritisation of the search areas and increases the chance of a successful rescue. Lastly, **WITOIL** *(Where Is The Oil)* is a service to deliver and disseminate the prediction of the transport and transformation of actual or hypothetical oil spills in the Mediterranean Sea.

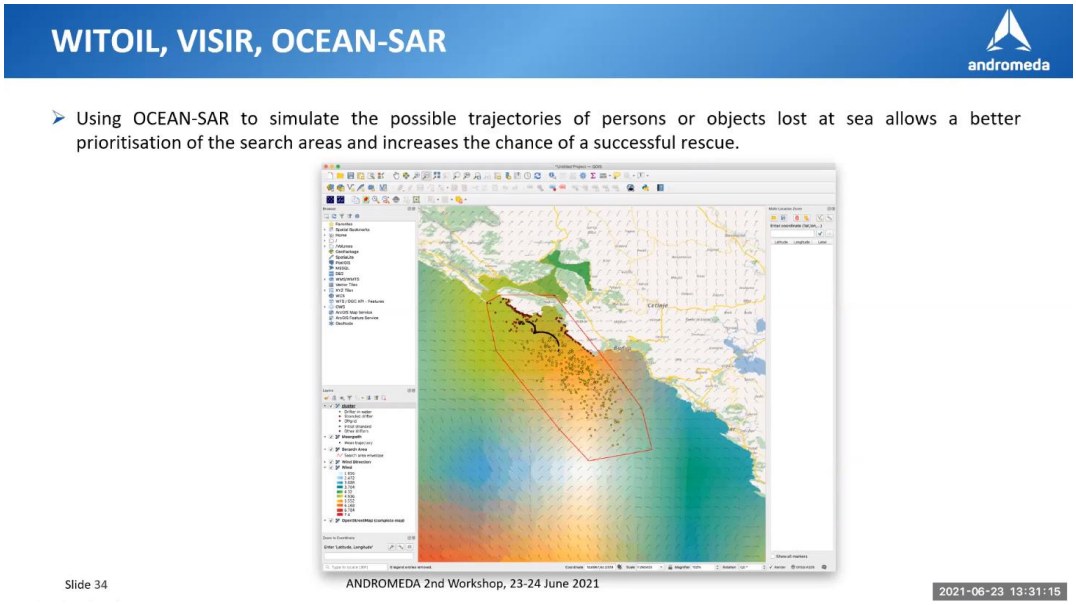

Figure 39: Mr. Giovanni Coppini (CMCC) while talking about the Decision Support Systems

The **fifth presentation** was made by **Mr. Tuomas Tammilehto** *(LAU)* who talked about ethics and societal impact of the ANDROMEDA solution. Ethics matter because it is extremely hard to compete with price against Asia while technological innovativeness is not always self-evident either. However, or maybe thus, the solutions to made need to be ethically sustainable and societally acceptable due to the fact that only those products will have real market success in the long run. Mr. Tammilehto described what was done in the ethical evaluation activities. In brief, the actions performed included taking care of all ethical requirements related to the execution of the project and looking further to the future with a Privacy Impact Assessment and assessing the ethicalness of the principles of the solutions, i.e. the ANDROMEDA Code of Conduct. It is a set of eight guiding principles which are:

1. The Justification of ANDROMEDA is Based on Ethical Grounds.
2. The Humanitarian Imperative and the Rights of the People at Land Boarders and Sea.
3. Moral Division of Labour in Maritime Surveillance and SAR
4. Value for End-users Involvement
5. Transparency, Liability and Human Decision Making:
6. Privacy and Data Protection
7. Data management and organizational arrangements and part of ANDROMEDA solution;
8. Robustness, Accountability and Learning.

Mr. Tammilehto wrapping up his presentation showcased to the audience the societal impacts which are briefly provided below.

- **Lives will be saved**: Better SAR capabilities will ultimately save lives.
- **Crime control:** The potential to catch, for example, drug traffickers or human smugglers better than before will benefit European crime control and policing. It will reduce harm.
- **More juste Europe:** Doing the right thing needs capabilities too. Thus, ANDROMEDA will contribute toward a juste world.
- **Saving European taxpayer's money:** Doing smarter, should result in saving costs.

- **More integrated Europe:** Collaboration and integration in one sector will lead into it in another sector too.
- **Demand for skilled workforce:** The omnipresent IT will require IT-savvy workforce.
- **New immigration routes:** New capabilities can result in new immigration routes.
- **Importance of sharing knowledge will become evident:** Knowledge is no longer power, sharing it will be. And, not just in maritime/border environment, but in every domain.

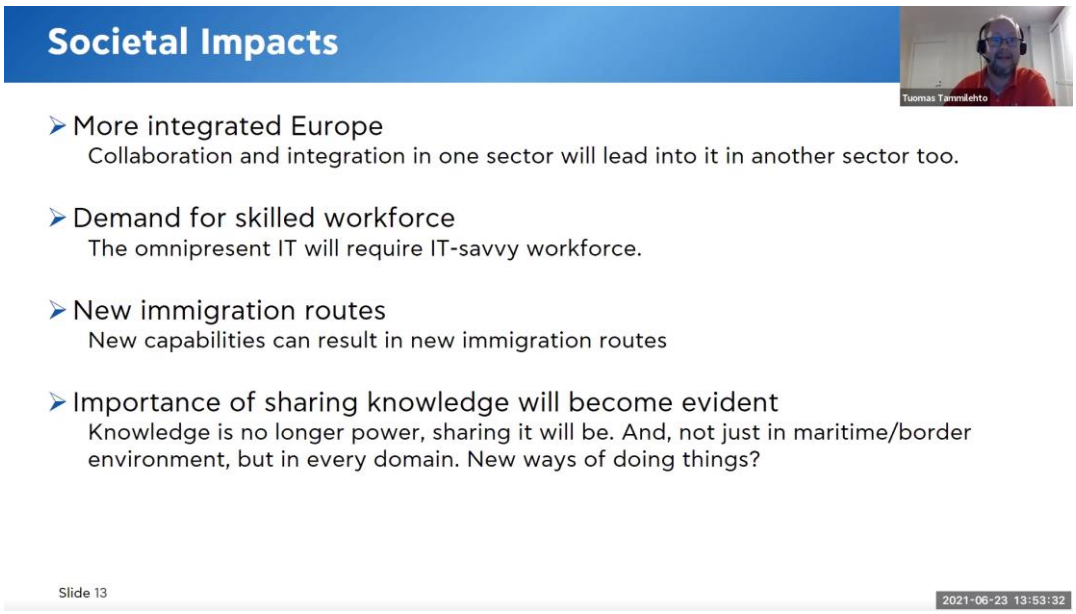

Figure 40: Mr. Tuomas Tammilehto (LAU) while presenting ethics and societal impact of the ANDROMEDA solution

The **sixth presentation** was made by **Mr. Alkis Astyakopoulos** *(KEMEA)* who talked about ANDROMEDA highlights, Impact and results. ANDROMEDA unlocked the full capabilities of CISE by enhancing the Maritime CISE Model and by extending its scope to the Land Surveillance Information Exchange (e-CISE). It reconfigured four Command & Control Systems for 100% compliance with e-CISE Data Model and CISE Service Model. Moreover, the ANDROMEDA project further developed and integrated advanced Data Fusion and Decision Support Services for both Maritime and Land domains. It was tested and validated in **3 long lasting trials** and overall it addressed the **"fragmentation"** and **closed "gaps"** in information sharing by providing a secure, effective common situational awareness and information exchange system integrated with CISE.

Mr. Astyakopoulos continued by talking about the **ANDROMEDA's Innovative capabilities** for border surveillance. These innovative capabilities in sum are:

- Complete integration with legacy systems and data sources *(AIS, VTMIS, Radars, Cameras).*
- Fully integrated software solution: *4 C2s, 5 Data Fusion Services, 3 DSTs, 1 UaV Surveillance Platform.*
- Effective information exchange among **7 authorities** from **5 countries** making easier joint operations.
- Baseline to connect other sites and Agencies to **the "e-CISE" border surveillance ecosystem**.
- **Wide area surveillance** *(e.g. border line of 100km)* including video streaming of multiple sources in real time.
- Creation of a **COP** at strategic and tactical level using **e-CISE.**

- Object **detection** and **tracking** from ground and UAV optical/thermal cameras.
- New assets with **surveillance equipment** for patrolling **land-river-maritime borders**.
- Advanced maritime & land anomaly detection capabilities and creation of complex rules in **real time**.
- Advanced IP network to **connect remote** and **inaccessible areas** in the borders with **NCCs/LCCs**.

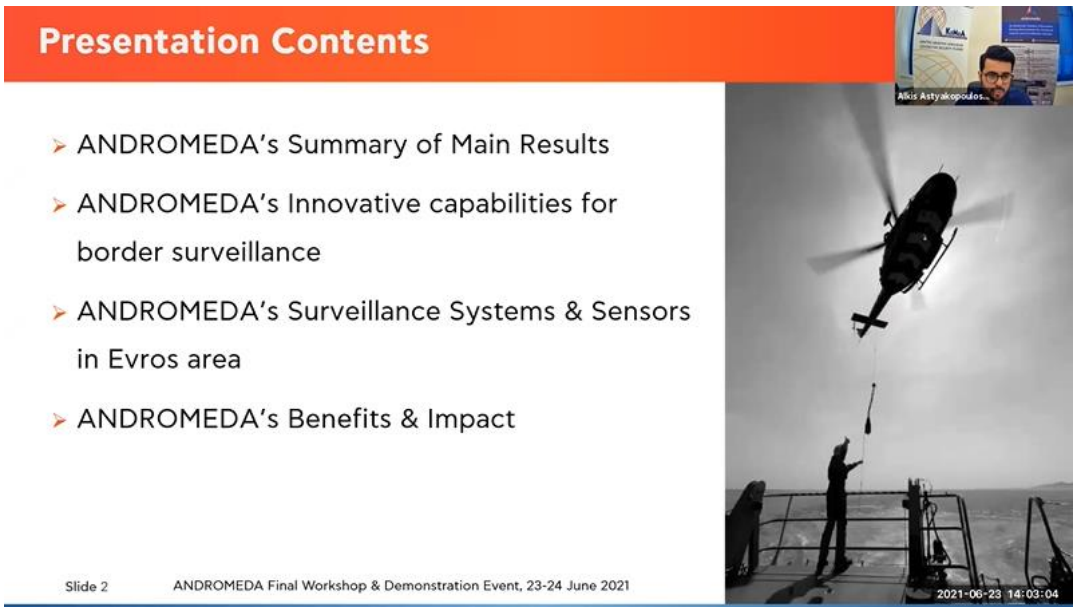

Figure 41: Mr. Alkis Astyakopoulos (KEMEA) while presenting the ANDROMEDA highlights, Impact and Results

3.3.3 Round-table discussion – Technical Session, Ethics & societal impact

The scope of this round table was to share ideas among a focused working group on technical aspects related to ANDROMEDA, getting very interesting opinions on the future of CISE, the EU funded projects and the role of AI in similar platforms. The round table was moderated by **Mr. Dimitris Katsaros** *(EXUS)* and the speakers who participated as panelists were **Mr. Jesus Hermida** *(EMSA)*, **Mr. Dragos Voicu** *(FRONTEX)*, **Mr. Franco Oliveri** *(JRC)*, **Mr. Antonis Kostaridis** *(STWS)*, **Mr. Alkis Astyakopoulos** *(KEMEA)*.

Question 1: What is the current state of play for CISE in terms of operational development and standardization? How useful is, from an operational point of view, a 100% e-CISE compatible system that can exchange data from maritime operations? (EMSA)

- **Mr. Jesus Hermida** *(EMSA)* response: CISE is in transitional phase, moving from CISE2020 to an operational network. EMSA is planning to have ready the development of the 2nd version of the CISE node on next February/March, which would be in pre-operational mode. In addition, one of the activities is also the standardization of the service model and the architecture of the CISE node. Now they are working with ETSI towards the standardization of CISE. They are working also on the data transfer from the different authorities and they take care the different operational needs. Regarding the operational usefulness of e-CISE it is up to the end users and the different authorities that they have used the platform.

Question 2: How useful is, from an operational point of view, a 100% e-CISE system that can exchange data from land operations? (FRONTEX)

- **Mr. Alkis Astyakopoulos** *(KEMEA)* response: Our priority is the e-CISE to be aligned with CISE data and service model. Of course, the enhanced CISE brings an added value to the end users both in maritime and land domains. It is also very useful the mix operations that we presented in ANDROMEDA with tangible results to the end users especially on the information sharing among the different authorities. Moreover, it would be nice in the future if there will be a standardize way of exchanging information among the land and maritime authorities, that will enhance the common operational picture.

- **Mr. Dragos Voicu** *(FRONTEX)* response: There could be a direct link with this project with specific funds like IBMF and ISF. In IBMF there are a few eligible actions, one of them could be actions for developing new technologies or developing results from particular research projects. In ISf also there are a few eligible actions, like developing innovative methods and deploying new technologies and research projects aiming at testing and validating their outcomes coming for EU funded projects. If I were a member state I would check what kind of technology is developing in ANDROMEDA and other research projects and could bring me added value. Concerning FRONTEX, it would be useful to have a specific meeting with FRONTEX, in order to discuss how ANDROMEDA results can be further exploited and under which framework.

Question 3: What is your opinion on the enhancements provided by the e-CISE Data Model? Do you consider them as a baseline for upcoming developments of the Data Model? (JRC)

- **Mr. Franco Oliveri** *(JRC)* response: It is very important that soon we will have a real operational CISE network, given that it is a very difficult achievement. Moreover, the achievements of ANDORMEDA project and due to the fact that extended CISE data model is a proof of CISE success. CISE is well designed and so important in order to be considered and be extended to other sectors. ANDROMEDA did an excellent job and the long-lasting Demonstrations was very good for operations, because it is the only way to see new tools and ideas in operations and to have specific conclusions. We should be all very careful with CISE achievements so far, therefore with the support of ETSI to design very careful the standardization in a way to be customized depending on the different needs. It could be a potential risk for CISE if it will be implemented something to heavy and in parallel if there will be to many stakeholders could dramatically slow down the evolution of the standards. There could be a series of plug-ins that are compatible and interoperable to help relevant sectors.

- **Mr. Jesus Hermida** *(EMSA)* response: It is very important that EMSA and JRC and other organizations are working together towards the standardization activities for the data and service model of CISE.

Question 4: Which is the role of AI in solutions like ANDROMEDA (STWS)?

- **Mr. Antonis Kostaridis** *(STWS)* response: The last years the technology has evolved in the AI and deep neural networks, in order to offer automatic solutions, such as object detections. In the area of maritime and land domain the AI has been used in projects for vehicle detection and sensors. In the frame of ANDROMEDA, the AI has been used for Anomaly detection, for on board UAV image analysis and from some legacy sensors that used for video analytics. However, in such projects there is a drawback due to the lack of open data in order to train properly the AI algorithms. That means that the technical partners, the industry and the universities need to have a closer collaboration with the end users that have legacy systems, sensors and the data sources, in order to proceed further in this domain.

3.3.4 European Research Projects Session

The European research projects session was moderated by **Mr. David Merino** *(GMV)* and the **first presentation** was made by **Mr. Fernando Barbero** who talked about the **OCEAN2020** project. PADR is the first step of the European Defense Research and Capability Development Programme. It is launched and funded by the European Commission and the European Defense Agency is the implementing agency. The OCEAN2020 is PADR's project with the highest budget, 35.5 million euro out of 90 million euro of the PADR budget. The consortium is consisted of 43 partners from 15 nations while ten national MoDs / Navies supporting OCEAN2020 which namely are: Italian Navy, Hellenic Navy, Spanish Navy, Portuguese Navy, Lithuanian Navy, German MoD, Swedish Navy, French Navy, Polish Navy and Royal Dutch Navy.

The **operation objectives** of the project are the significant improvement of maritime Situation Awareness through the integration of UXS *(Unmanned Systems)* with ISTAR *(Intelligence Surveillance Target Acquisition and Reconnaissance)* payload capabilities and the Interoperability by use of open architecture and recognised standards. Mr. Barbero continued his presentation with the **technical objectives** of OCEAN2020 which are listed as follows:

- High integration among EU countries and heterogeneous systems, demonstrated in full-scale live trials.
- Mediterranean Sea demonstration in 2019.
- Baltic Sea demonstration in 2021.
- Development of EU C4ISR open architecture.
- Integration of EU/NATO/civil data framework.
- Advanced data and information fusion techniques for shorter decision time at CMS (*Combat Management System)* and MOC *(Maritime Operations Centre)* levels.
- Increased autonomy for UXS, swarm operations, cooperation of assets.

Lastly, regarding the **cooperation objectives** are:

- Diverse EU wide consortium to demonstrate large military R&T effort.
- Improve market position of European defence industry in UXS.
- Involve End-Users in design choices.

The expected impact is to demonstrate the potential of EU-funded research for defense applications and boost the European industrial capacity in the military unmanned systems market

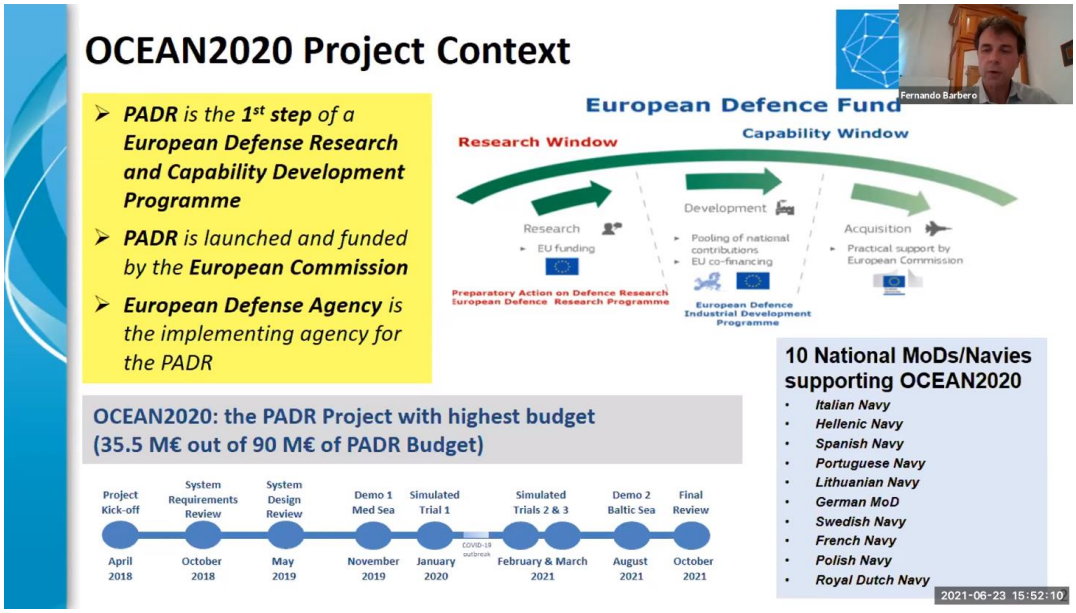

Figure 42: Mr. Fernando Barbero while presenting OCEAN2020 project

The **second presentation** of the session was made by **Mr. Nexhat Kapidani** who talked about the COMPASS2020 project. Mr Kapidani started his presentation with the main problem observed that is the current available technologies for persistent border surveillance represent high costs due to the lack of interoperability of means, which has caused a slow intake by the competent authorities. Thus, the project's objectives are to demonstrate the combined use and seamless coordination of manned and unmanned assets; to achieve greater coverage, better quality of information and shorter response times in maritime surveillance operations and lastly, to provide a solution with improved cost-effectiveness, availability and reliability of the operations. Within this frame, the offered solution includes innovative CONOPS that are proposed in order to make use of multiple aerial and underwater unmanned vehicles with improved surveillance capabilities, deployed from OPVs or from land, and supported by a central, multi-domain and interoperable, Mission System (MS) to enable the operation of these from both locations. Moreover, UxVs will act as organic ship sensors, providing critical mission data to the MS that can be exploited through dedicated services developed within the project *(e.g. data fusion and threat risk analysis).*

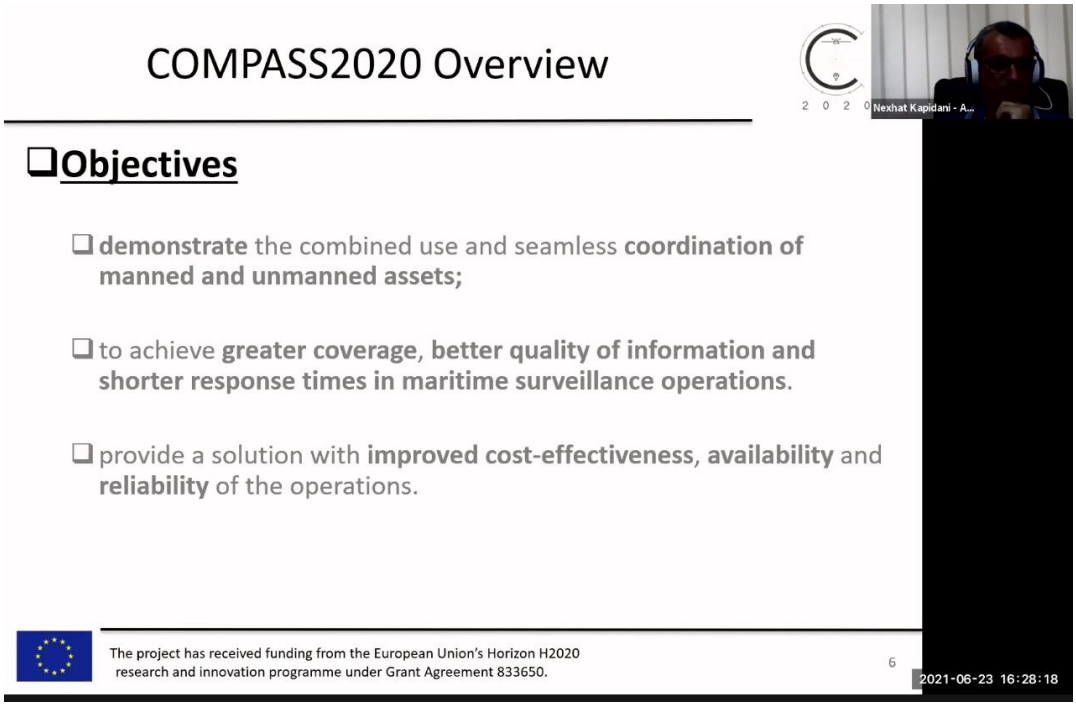

Figure 43: Mr. Nexhat Kapidani while presenting COMPASS2020 project

The **last presentation** of the current session, made by **Cdr. Alexis Blum**, was about the **EFFECTOR project.** Cdr. Blum explicated that the project offers a solution for maritime surveillance and border security which includes an interoperability framework and associated data fusion and analytics services. In brief, EFFECTOR improves the decision support process by enabling faster detection of new maritime events. At the same time EFFECTOR assists the operating authorities and on-site intervention forces in communicating and sharing information within a common environment, the CISE. The EFFECTOR system is tested, validated and demonstrated in real operational scenarios together with maritime authorities, End Users and practitioners in France, Portugal and Greece. The project's objectives are provided below:

- Implement a multi-layered data lake platform for end-to-end interoperability and data exploitation that will facilitate the seamless integration of maritime surveillance systems and the interoperation of information systems at tactical and strategic level.
- Enable the sharing of an enhanced situational awareness picture at local, regional and national level with CISE and EUROSUR.
- Implement a data harmonization layer, adopting interoperability standards and proposing standards where necessary, for exploiting data sources and systems currently underutilized in maritime surveillance environment.
- Demonstrate new concepts and tools for knowledge extraction, semantic representation, data fusion, analytics, and federated querying.
- Validate and demonstrate the applied solutions in three operational trials together with national maritime authorities, End Users and practitioners.
- Ensure full compliance with the existing regulatory framework on personal data protection and privacy.

Cdr. Blum wrapped up his presentation by showcasing the linkage of EFECTOR with the ANDROMEDA. EFFECTOR will exploit the e-CISE Data Model of ANDROMEDA and adopt extensions that are related to enhanced cross-border situational awareness and operational collaboration between Member States

coordination centres. Moreover, technical feedback on CISE implementation *(CISE Nodes, CISE Adapters, Implementation & Connection)* as well as sample sharing and surveillance data during the implementation and integration phase of EFFECTOR. Lastly, EFFECTOR will provide feedback on technical implementation by integrating legacy systems of Member States.

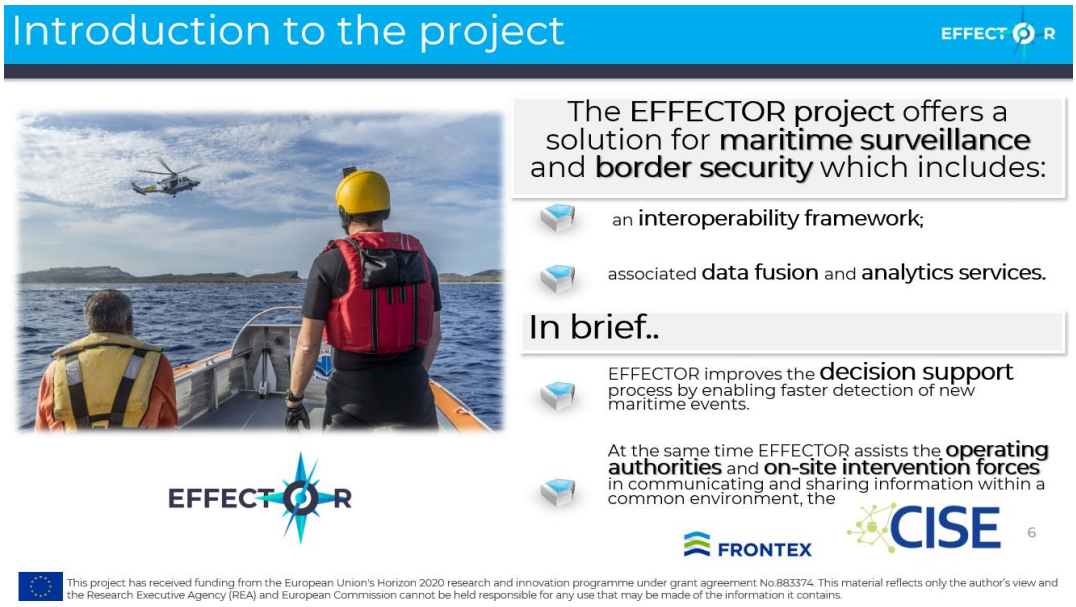

Figure 44: Cdr. Alexis Blum while presenting EFFECTOR project

3.3.5 Round table Discussion – European Research Projects

The round table focused on the European Research Projects was moderated by **Mr. David Merino** *(GMV)*. and the speakers who participated as panelists were **Mr. Fernando Barbero** *(OCEAN2020)*, **Mr. Nexhat Kapidani** *(COMPASS)*, **Cdr. Alexis Blum** *(EFFECTOR)*.

Question 1: Which of the related projects makes use of CISE and which are/were the implementation challenges?

- **Mr. Fernando Barbero** response: In **OCEAN2020** during the Mediterranean trial some integration was made, but limited due to other tasks that have to be also performed) communications, integration of multiple vehicles…). A dedicated adaptor was implemented, deployed at Italian Maritime Operation Center and information related to vessels was exchange through CISE. This example of collaboration between military and civil domain was really useful and will be stated as one of the main lessons learnt from the project.

- **Mr. Nexhat Kapidani** response: In **COMPASS2020 project** the aim is to integrate different assets but in the frame of a single organization. Nevertheless, if in real operation you will need to use assets from multiple organizations so CISE can help with that. Montenegro is not part of EU but is willing to be part of CISE. Even being a small state it is worth to invest on it, the benefits are bigger. You would not need to invest on multiple sensors, you can use resources from other national or international stakeholders.

- **Cdr. Alexis Blum** response: The main challenges for **EFFECTOR** are two. The first one is to get the authorization to connect to a CISE node, and the second one is the time. There is going to be a new environment deployed in CISE and it is really close to the trials, so that can be an issue. Maybe this has to be deployed only in the third trial.

- **Mr. Franco Oliveri** made a comment about **Mr. Nexhat Kapidani** response: The cost of connect to CISE is not expensive. You only need to make some internal preparation, but the cost is low. You start step by step with a few services. It is incremental. The initial cost of the server is low, the software is provided by the European Commission by EMSA, and you only need to develop an in-house adaptor. Everybody is welcome in CISE and we have made an effort to keep the entry cost as the lowest possible.

- **Mr. Nexhat Kapidani** response to **Mr. Franco Oliveri** comment: We are internally deciding who will be the agency in charge of the node and the adaptor. We are contacting European Commission, DG MARE, and expressing our willingness to join the network, and participate in the EMSA workgroups. Same path that we have followed for CLEANSEANET, SAFESEANET etc. We have received a good answer, and we hope to be part of CISE in a near future.

Question 2: Which gaps and opportunities could your project fill/offer in relation to the ANDROMEDA solution?

- **Mr. Nexhat Kapidani** response: One gap of **COMPASS2020** is that it is focused on the assets of a standalone agency. In order to get a bigger surveillance coverage, eCISE can help to involve other agencies/countries with similar mission systems

- **Cdr. Alexis Blum** response: **EFFECTOR** is going to be the same approach of ANDROMEDA regarding eCISE.

- **Mr. Fernando Barbero** response: Either in ANDROMEDA and OCEAN2020 different Coordination Centers were connected, and data fusion services and drones have been used. So it would be possible to exchange information from an OCEAN2020 operation to an ANDROMEDA stakeholder using this CISE network. So some aspects that have been addressed by a stakeholder from OCEAN2020 can be useful to an ANDROMEDA stakeholder.

3.4 Demonstration Event Presentations and Discussions (24th June 2021)

The demonstration event was organized in conjunction with the 2nd ANDROMEDA Workshop and was held also virtually the day next, on 24th of June 2021. Given that the main topic of the event was the demonstration of the ANDROMEDA systems via real scenarios from project's trials, the core part of the current section gives a summary of the round table discussion focusing on the results produced from the implementation of the project. Moreover, in this section the Trials, their operational situation and operational goals are briefly described for ensuring that no prior knowledge on the topic is requested by the reader in order to comprehend the discussions made during the round table discussion session.

3.4.1 Opening Session (Demonstration Event)

The Demonstration event was opened by **Mr. Dimitris Katsaros** *(EXUS)* as moderator. Later on, **Mrs. Athina Foka** from the Hellenic Ministry of Maritime Affairs and Insular Policy welcomed the speakers and the attendees. Moreover, **Mr. Dimitris Myttas** from KEMEA welcomed the audience and highlighted the utmost importance of End-Users active involvement in this project.

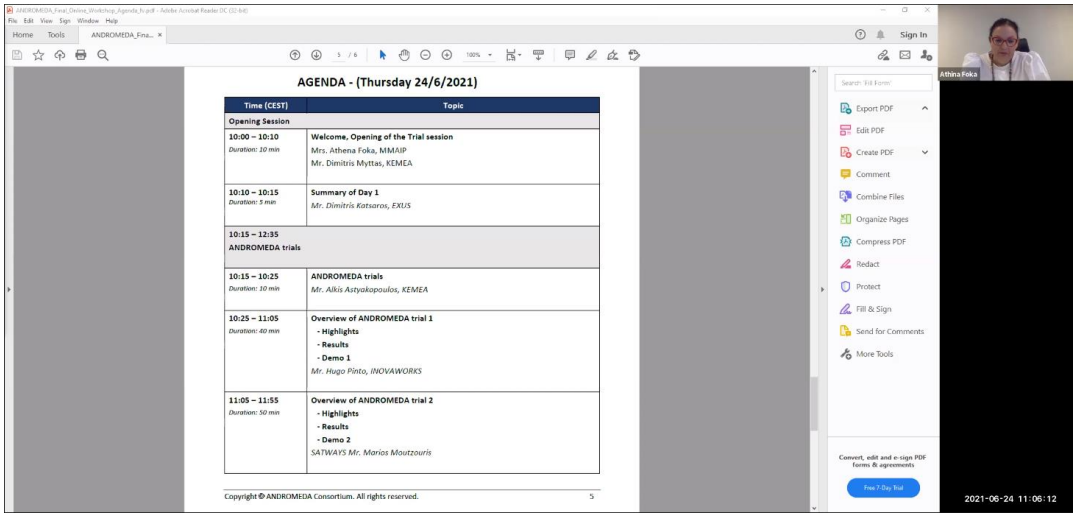

Figure 45: Mrs. Athina Foka (MMAIP) while welcoming speakers and attendees in the Demonstration Event

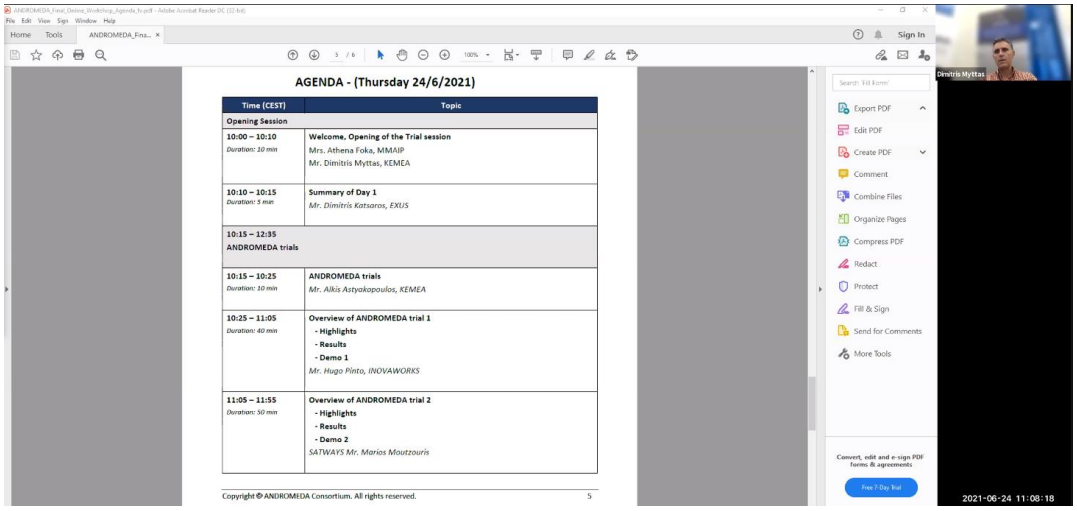

Figure 46: Mr. Dimitris Myttas (KEMEA) while welcoming speakers and attendees in the Demonstration Event

3.4.2 ANDROMEDA Trials (Demonstrations)

The demonstration session was started by **Mr. Alkis Astyakopoulos** *(KEMEA)* who talked about the ANDROMEDA trials and briefly gave their description.

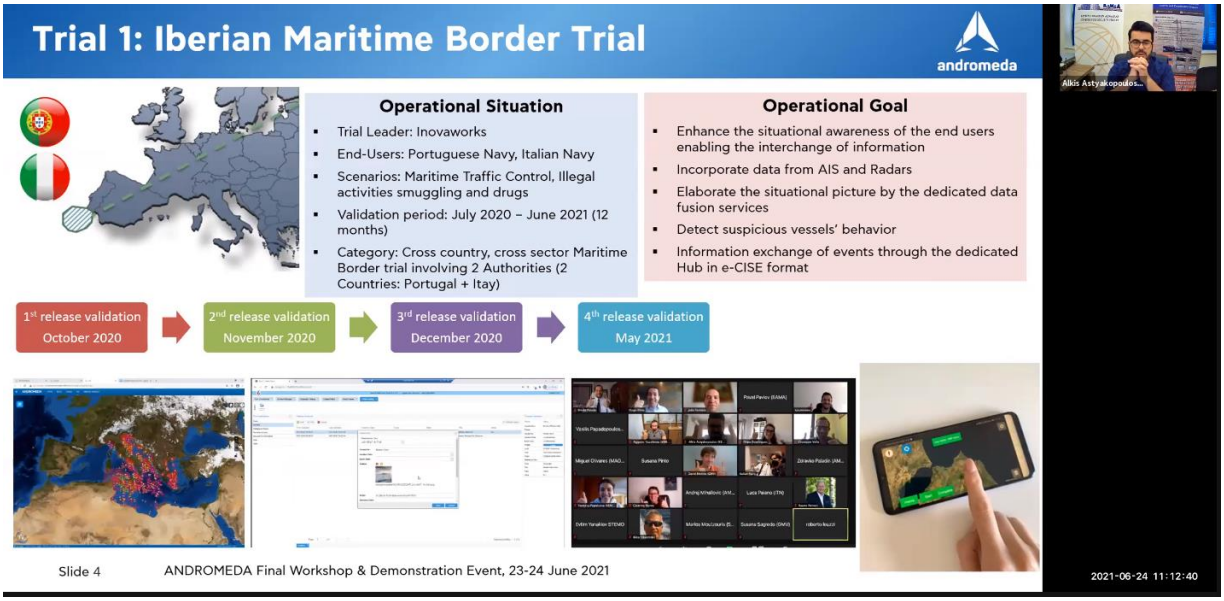

Figure 47: Mr. Alkis Astyakopoulos (KEMEA) while giving an overview of the ANDROMEDA trials

The **first demonstration** was made by **Mr. Hugo Pinto** *(INV)* who showcased the ANDROMEDA trial 1, the Iberian Border Maritime Trial.

Operational Situation

- Trial Leader: Inovaworks.
- End-Users: Portuguese Navy, Italian Navy.
- Scenarios: Maritime Traffic Control, Illegal activities smuggling and drugs.
- Validation period: July 2020 – June 2021 *(12 months).*
- Category: Cross country, cross sector Maritime Border trial involving 2 Authorities *(2 Countries: Portugal + Italy).*

Operational Goal

- Enhance the situational awareness of the end users enabling the interchange of information.
- Incorporate data from AIS and Radars,
- Elaborate the situational picture by the dedicated data fusion services.
- Detect suspicious vessels' behavior.
- Information exchange of events through the dedicated Hub in e-CISE format.

Validation Releases

- 1st release validation: October 2020.
- 2nd release validation: November 2020.
- 3rd release validation: December 2020.
- 4th release validation: May 2021.

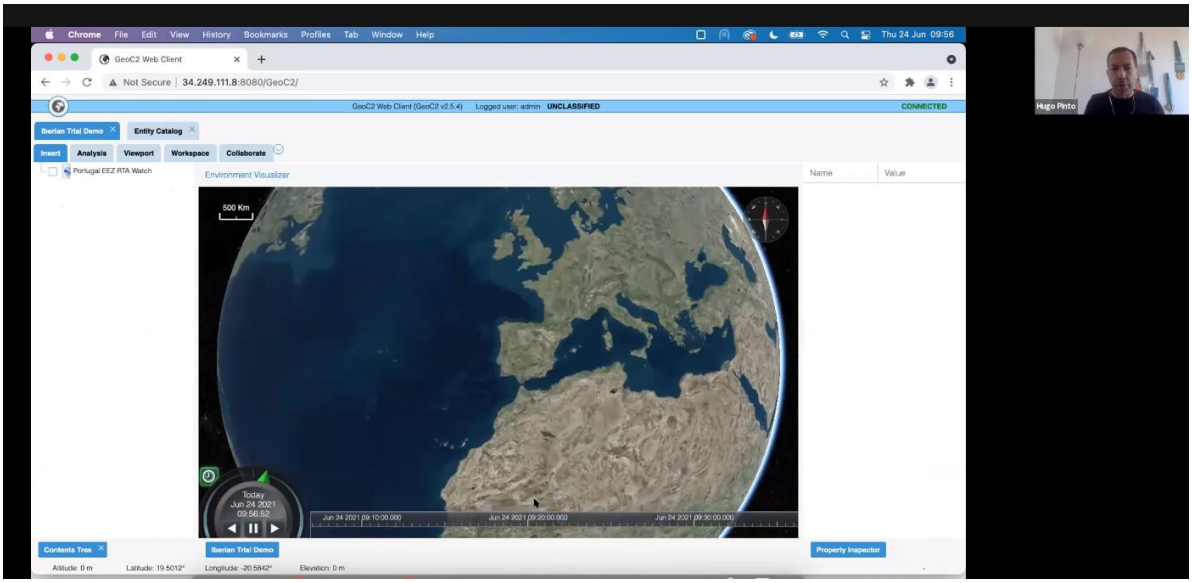

Figure 48: Mr. Hugo Pinto (INV) while demonstrating Trial 1

The **second demonstration** was made by **Dr. Marios Moutzouris** *(STWS)* who showcased the ANDROMEDA trial 2, the Greek – Bulgarian Land Border – Maritime Trial.

Operational Situation

- Trial Leader: SATWAYS.
- End-Users: Hellenic Coast Guard, Hellenic Police *(Headquarters, Alexandroupolis, Nea Vyssa)*, Hellenic Ministry of Defence, Bulgarian Maritime Administration.
- Scenarios: Irregular Migration *(land)*, Irregular Migration *(river)*, SAR *(Delta/sea – river)*, Cross border drug dealing, Request for identification, vessel position & activity.
- Validation period: July 2020 – June 2021 *(12 months)*.
- Category: Mixed cross country, cross sector Land and Maritime trial involving 4 Authorities *(2 Countries: Greece + Bulgaria)*

Operational Goal

- Integration with legacy systems and new surveillance equipment *(mast, patrol boat, fence)* including telecoms for real-time video streaming *(radars, AIS, cameras)*.
- Detection of possible patterns of anomalous behavior of the vessels/vehicles used for trafficking in human beings.
- Detection of objects that identify a group of people moving along the land border line.
- Better performing tools for earlier detection of suspicious activity and identification of threats.
- Generate improved COP and share information between the main actors in e-CISE format.

Validation Releases

- 1st release validation: July 2020.
- 2nd release validation: October 2020.
- 3rd release validation: December 2020.
- 4th release validation: June 2021.

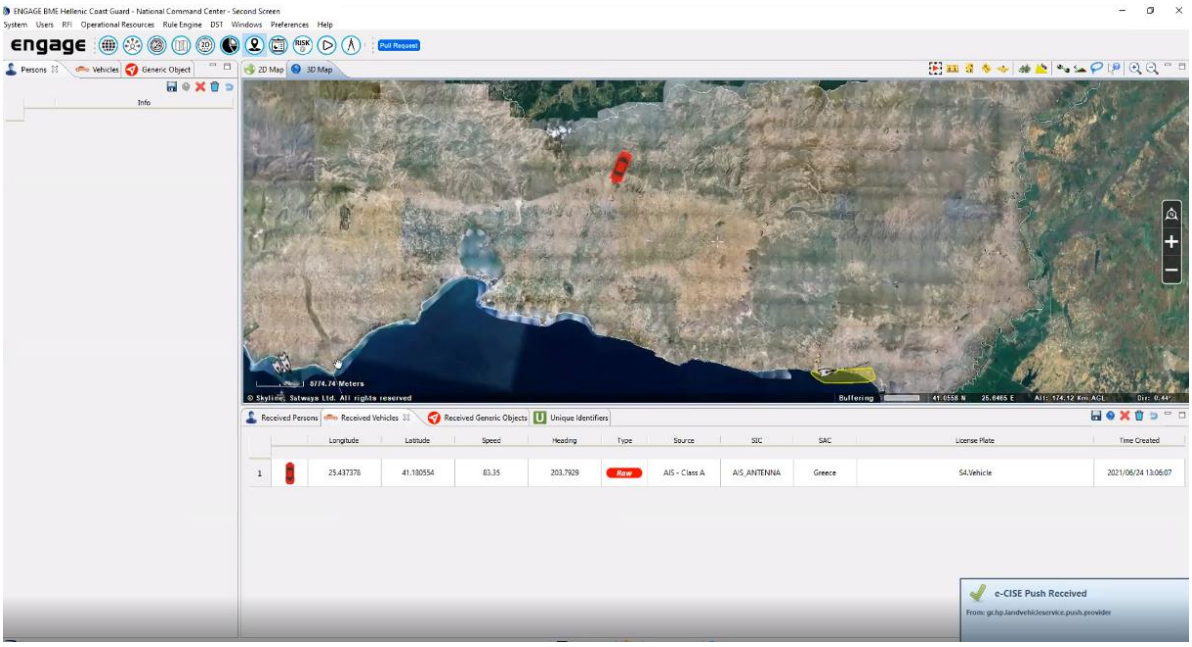

Figure 49: Dr. Marios Moutzouris (STWS) while demonstrating Trial 2

The **third demonstration** was made by **Mr. Roberto Leuzzi** *(CODIN)* who demonstrated the ANDROMEDA trial 3, Ionian - Adriatic Maritime Trial

Operational Situation

- Trial Leader: CODIN
- End-Users: Hellenic Coast Guard, Hellenic Ministry of Defense, Italian Navy, Maritime Safety Department of Montenegro
- Scenarios: SAR, Smuggling, Human Trafficking
- Validation period: September 2020 – June 2021 *(10 months)*
- Category: Cross country, cross sector Maritime Border trial involving 4 Authorities *(3 Countries: Italy + Greece + Montenegro*

Operational Goal

- Recognition of vessels with divergent behavior
- Monitoring vessel behaviors by acquisition of AIS and meteo data
- Detection and monitoring of vessels abnormal behavior based upon departure port or location at sea, test data fusion services and DSS tools.
- Information exchange capabilities through e-CISE format.

Validation Releases

- 1st release validation: October 2020
- 2nd release validation: November 2020
- 3rd release validation: December 2020
- 4th release validation: March 2021

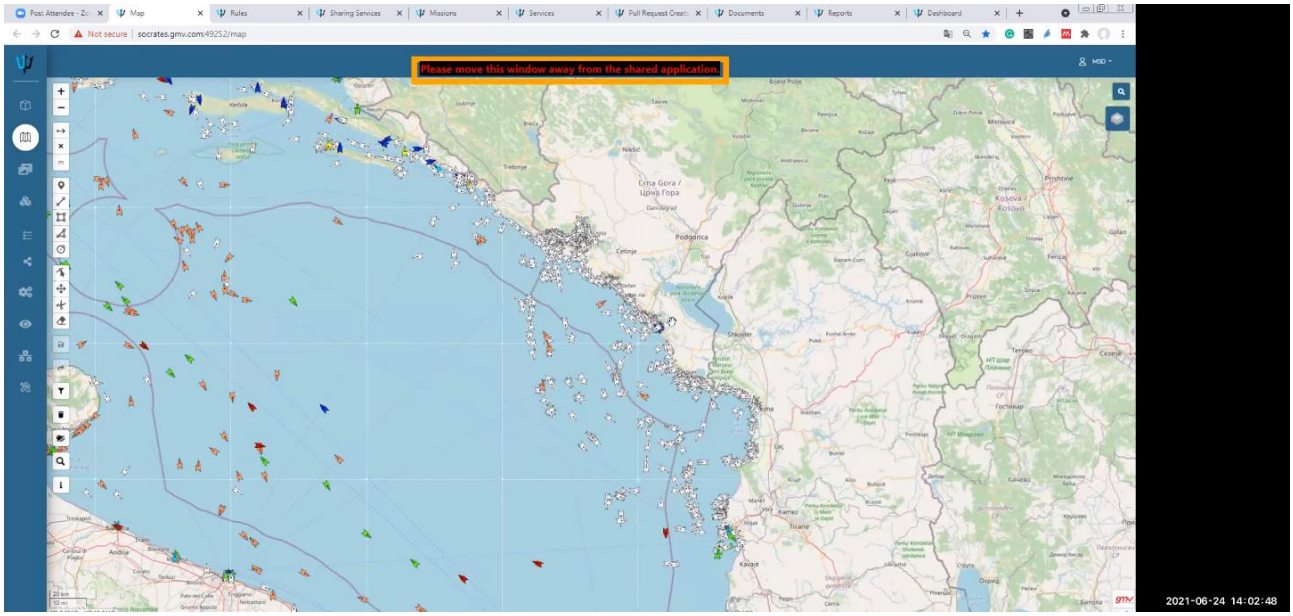

Figure 50: Mr. Roberto Leuzzi (CODIN) while demonstrating Trial 3

3.4.3 Round table Discussion – Demonstration Event

The round table discussion of the Demonstration event was moderated by **Mr. Alkis Astyakopoulos** (*KEMEA)* and the speakers who participated as panelists were **Mr. Gianluca Luraschi** *(EMSA)*, **FRONTEX**, **Mr. Franco Oliveri** *(JRC)*, **Cdr. Luca Bertocchi** *(ITN)*, **CTEN Loureiro da Paixão** *(PTN)*, **Lt. Cdr. Iordanis Naziris** *(HCG)*, **Police Major Dimosthenis Kamargios** *(HPL)*, **Police Captain George Tournakis** *(HPL)*, **Mr. Giannakelis** *(HN)*, **Mr. Nexhat Kapidani** *(AMSPM)*, **Chief Expert Kamen Krachmarov** *(EAMA).*

Question 1: Which is from your perspective the most important result and advancement that ANDROMEDA brings in the CISE world in general? Please provide us your future activities, plans regarding CISE updates and your guidelines or the way of improving ourselves and getting as much as familiarized and as much closer to a more operational way at CISE.

- **Mr. Gianluca Luraschi** response: I think a couple of important results that you should consider for the future of this initiative is the sustainability over the period that project finishes, that is something that you have to sorted out by yourselves. In terms of results, I want to say that are two things that sound very promising and interesting for the further future. The one is the probably known as CISE 3 type of family of services, one called command, one collaborative and the last data streaming services. So the work that you have shown to us and you have done in command and control type of activity is very promising to me. It is showing somehow that the collaborative services can be beneficial to be implemented in CISE. That was the one interesting result that we can demonstrate further and added in the next CSG meetings *(CISE Stake Group meetings)*. The next is in October and you can participate to show what you have done and achieved in ANDROMEDA project. The second important result is the standardization, but we have to be very concerned about. CISE as a mentor of data and service model should aim to have a quite good level of interoperability among different sectors. The complexity of the data model should be as much as possible limited to enable an exchange of information among the seven sectors that are now a part of the CISE type of maritime functions. So when we further specify a data model to reach a level of clarity that will be useful to a specific sector, we have to be concerned about the fact that driving the process in a such type of exercise could create and increase a complexity to share info with other types. So we have to balance the richness of the

data model that you have further elaborated. On the other hand, we have to be sure that the interoperability with other sectors are preserved and not being implemented.

Question 2: What is your overall feedback for ANDROMEDA project regarding the results that you have seen? Regarding the CISE data model how helpful you see this extension is and how this can be done in the future when the V2 of CISE node will be available publicly?

- **Mr. Franco Oliveri** response: I would like to start looking the ANDROMEDA project from the outside. I would praise the interpretation of the C2 system since I come from the industry that dealing with the military environment and command and control system. I know the complexity of this achievement and I also appreciate the launch of your field trials. It is something that we would like to duplicate in other project and it is very commendable that you manage to have such a log field trial. I also appreciate the type of useness that you presented. I was lucky enough to be on that patrol boat and I know the complexity of that specific piece of land border. So the overall lessons from the project are very positive and also in due for the future provisioning of this type of tool to the practitioners. As for the extension of CISE, I would also like to praise and be ready to take on board CISE to be able to make it operational as soon as possible. At this stage I know that David will help you out during the initial stage of the development of e-CISE. I know that everyone will give out their best but we have to be careful. We know there are risks but I'm very optimistic and know that we will do everything within the right framework.

Question 3: What is your overall feedback about the project and its capabilities? How those capabilities can support and help your daily operations in Italian navy? What is your overall feedback from the trials?

- **Cdr. Luca Bertocchi** response: I would like to thank you for the organization and invitation. We were managing WP2 *(end-users and operational aspects and requirements).* We participated in the Adriatic and Iberian trials. From my point of view, the entire project worked very well and demonstrated the importance of interoperability between the command and control system and maritime situational awareness systems. During the trial we develop different scenarios mainly in real time environment (smuggling, human trafficking etc.) and in this framework we share data in order to produce a common maritime operational picture between different end-users. From the operational point of view, the main goal is the generation of a single track with as much attributes as possible and is very important to reduce and avoid the operator work, especially the one related to the validation of a track and the validation of situation. The operator has to realize what is going on in real time in the field. Considering the long-lasting demos, probably the CISE consent needs continuous development and process and the ANDROMEDA – CISE goals are on demonstration of this. Because ANDROMEDA tries to unlock additional application for improving them in the border maritime surveillance. We need this continuous development because of the expansion of the networking to different entities that in various ways can share data services. In short the same data or the same tracks of interest are observed and managed with different eyes and different awareness, according to institutional tasks of the organizations. Personally, I believe that the maritime land combination must be pursued in order to develop a common and standardized form of data exchange and rules. The role of the data is playing a really important role in this type of a function. Baseline as a main reference there should be a greater willingness, a greater commitment to sharing data between countries, institutions and agencies with a view to exploit as much as possible the type line of a CISE concept and architecture.

Question 4: From your side, the Hellenic Coastguard, can you please overall let us know how much satisfied are you from the ANDROMEDA system capabilities and which is the most important result of the system advancement that you keep and would like to see?

- **Lt. Cdr. Iordanis Naziris** response: It was quite challenging for us, regarding the scenarios, the trials we were involved in the Greek – Bulgarian one and the Ionian – Adriatic. Based on this experience

we would like to express our satisfaction concerning the capabilities of ANDROMEDA system. Quick information sharing within the authorities is quite important for us and I believe it is the main advantage of ANDROMEDA. I would also like to thank SATWAYS because through the validation procedure they manage to adapt the ANDROMEDA system to HCG needs, incorporating most of our remarks and comments. So overall we are satisfied with the system and its capabilities. Of course, there are some minor issues that could be improved but we don't forget that is in a research level yet. However, the solution proved it is efficiency. Some other features I would like to highlight is the capability to share in real time all these data including radar data, video from camera etc. It is very useful to have a visual perception of the event. The mapping of all needed data is very important. Furthermore, the capability to exchange data between land and maritime authorities is very significant, since HCG closely cooperates with Hellenic Police for common operations and this was successfully demonstrated through the Greek – Bulgarian trial. The mobile version of the system was very efficient and handy also. The capability to detect abnormal behavior improves operational awareness. Artificial intelligence is here and helps a lot. All these results to better informed decision making. To sum up ANDROMEDA is system with many capabilities and great potential. If I have to highlight the most important result for us, it was the opportunity to interact with other end-users and technical partners. Working with end-users help us identifying common challenges and trying to find smart solutions that serve us all. The collaboration with SATWAYS ensure the development and feasibility of these solutions. The creation of tools that could help us be more efficient with less cost and assisting the decision-making process for us.

Question 5: Please let us know your feedback from the operational usage of those new surveillance equipment that has been installing in the area of Alexandroupolis. Which is the added value given to your operation? What is your overall feedback regarding the collaborations you had during the additional entities during trials?

- **Police Major Dimosthenis Kamargios** response: It was really important for us to be a part of ANDROMEDA project, to see new technologies and test new sensors in our area. It was really effective for us to combine and integrate new sensor which is establishing maritime radars and new cameras in our area and to combine this with all the existing sensors which are used already from our side. It is also really helpful to see the results of the new software from SATWAYS. It is very important for us also to have better and online cooperation and sharing information with other agencies. Another important thing is that we now have a platform to share information directly with them. The last I want to mention is that all the equipment and the software was operated for one year in our area and it will continue to operate.

Question 6: It will be a great pleasure if we will receive your overall feedback from ANDROMEDA and in which dimension you are satisfied from the system capabilities.

- **Police Captain George Tournakis** response: The most important thing that we keep of this is that the long period of trials demonstration is very critical for that kind of projects. First of all because all these products of the project have to be adopted and fit with the legacy systems and it needs time to achieve this on the same time, it is very useful for us to have enough time in order to evaluate the whole project that is running here in the area. I am totally covered with everything that has been said for ANDROMEDA and I totally agree with all of them.

Question 7: I would like to hear from your side what was your experience from trials and how much satisfied are you from the overall project?

- **Mr. Odysseas Giannakelis** response: The ANDROMEDA system was really very flexible and impressed me. The very good cooperation between countries, the fast and secure dissemination of information and the easy to use software are the point that pick my interest. Particular emphasis should be placed on the immediate correction of problems that countered during the test and the resolutions

of all questions in the relevant bodies was a very important factor for the smooth running of the program tests. What I keep from ANDROMEDA is the easy to use software platform and that everything worked in the desire degree.

Question 8: Your overall feedback from ANDROMEDA's capabilities. What will you be interested to keep in Montenegro and how the ANDROMEDA showed the way to continue to bring together Montenegro with EU? Your overall feedback for information sharing.

- **Mr. Nexhat Kapidani** response: Regarding Montenegro we participated in the project, although we are not a part of EU. Having in mind the importance of data sharing you have invited us as external partners to get basic knowledge for CISE and ANDROMEDA. First of all, we have access for the first time in C2 systems and together with the colleagues from Spain we have tried to improve existence functionalities from the perspective of the end-users. Finally, what is by side effect and very important for us is that we started initiated internal discussions about the CISE. We plan a CISE implementation in Montenegro. The most important thing is having in mind the EMSA is technical partner in CISE projects. ANDROMEDA is very important for us for all the knowledge that gave.

Question 9: Can you please provide your overall feedback from your participation in the trial and the way that the project itself has improved your way of working in operational level?

- **Chief Expert Kamen Krachmarov** response: I will try to share with you our impressions from our participation in ANDROMEDA project. Within this project Bulgarian Maritime Administration contributed the achievement of the capability and interpretation of the enhanced EU CISE model by providing added value to our maritime system in the area of our responsibility. During the implementation of ANDROMEDA project, we participated as a full partner in the capacity of end-users providing expertise in the field of maritime integrated surveillance. We believe that to a higher extend the ANDROMEDA project aims to exploit the potential of CISE by validating the system of costal and border agencies. One of the main aims of the project was to improve validate and to demonstrate CISE by extending its scope to land borders and adapting relevant command and control solutions and related services, which according to us are fully completed. Regarding the Greece – Bulgarian trials we think that it was provided and was very well structured and was executed in the line with the real time practical scenarios. The main object of this trial, the interoperability of CISE with the implement of situational awareness using the advantages of ANDROMEDA services and providing the improved operational framework in parallel with the legacy automated surveillance systems controlled by the local C2s, was achieved and completed. In conclusion ANDROMEDA design system's architecture and technical specifications for each trial were not only well defined but were also fully integrated.

4. Conclusion

This document outlined the activities that the ANROMEDA consortium made for organizing its second Workshop as well as its Demonstration Event. In addition, it presented a summary of key information from all topics elaborated by the invited speakers, the discussions made, the questions raised and the responses provided to them. Throughout both of these ANDROMEDA events **twelve** presentations and demonstration were given and **three round table** discussions took place where external prestigious experts participated as panelists. The project team had the opportunity to reveal the ANDROMEDA final results produced; bring up the importance of CISE (e-CISE) also in the land border domain; exchange ideas with other EU funded projects in the same domain and demonstrate through videos the project's trials and their scenarios.

The organization of both events *(2nd Workshop and Demonstration event)* was of great success as the actual attendance for the workshop was **129 people** *(23rd June 2021)* and **113 people** in **Demonstration Event** (*24th June 2021)* while the number of registrations was slightly higher with **133 registrants in both days** *(common registration form)*. Therefore, given the successful organization of these events, ANDROMEDA consortium managed to present and promote the project results to the possible larger multidisciplinary audience, creating opportunities either for new collaborations or direct exploitation of specific solutions.

5. Annex: Quality Review Report

The ANDROMEDA Consortium uses the Quality Review Report process for its internal quality assurance for deliverables to assure consistency and high standard for documented project results.

The Quality Review Report is used individually by selected peer reviewers. The allocated time for the review is 7 calendar days. The author of the document has the final responsibility to reply on the comments and suggestions of the peer reviewers and decide what changes are needed to the document and what actions are to be undertaken.

5.1 Reviewers

Project Coordinator	Athena Foka (MMAIP)
Management Support Team Member	Alkis Astyakopoulos (KEMEA)
Internal Peer Reviewers	David Merino (GMV), Dimitris Katsaros (EXUS)

5.2 Overall Peer Review Result

The Deliverable is:

☐ Fully accepted
☒ Accepted with minor corrections, as suggested by the reviewers
☐ Rejected unless major corrections are applied, as suggested by the reviewers

5.3 Consolidated Comments of Quality Reviewers

General Comments	
Deliverable contents thoroughness	Reviewers comment: Check comments provided with track changes Author's reply:
Innovation level	Reviewers comment: Author's reply:
Correspondence to project and programme objectives	Reviewers comment: Author's reply:
Specific Comments	
Relevance with the objectives of the deliverable	☒ Yes ☐ No ☐ Partially ☐ Not applicable Reviewers comment: Author's reply:
Completeness of the document according to its objectives	☒ Yes ☐ No ☐ Partially ☐ Not applicable Reviewers comment: Author's reply:

Methodological framework soundness	☒ Yes ☐ No ☐ Partially ☐ Not applicable Reviewers comment: Author's reply:
Quality of the results achieved	☒ Yes ☐ No ☐ Partially ☐ Not applicable Reviewers comment: Author's reply:
Structure of the deliverable with clear objectives, methodology, implementation, results and conclusions	☒ Yes ☐ No ☐ Partially ☐ Not applicable Reviewers comment: Author's reply:
Clarity and quality of presentation, language and format	☒ Yes ☐ No ☐ Partially ☐ Not applicable Reviewers comment: Author's reply:

Detailed Comments (please add rows as appropriate)		
No.	**Reference**	**Remark**
1		
2		
3		
4		
5		