

# D6.2 - Exploitation and Dissemination Report

<b>Deliverable ID:</b>	D6.2
<b>Dissemination Level:</b>	PU
<b>Project Acronym:</b>	TAPAS
<b>Grant:</b>	892358
<b>Call:</b>	H2020-SESAR-2019-2
<b>Topic:</b>	Digitalisation and Automation principles for ATM
<b>Consortium Coordinator:</b>	CRIDA
<b>Edition date:</b>	15 June 2022
<b>Edition:</b>	00.01.01
<b>Template Edition:</b>	02.00.03

## Authoring & Approval

### Authors of the document

Name / Beneficiary	Position / Title	Date
E. Iglesias / <b>CRIDA</b>	WP6 Leader	15/06/2022
N. Valle / <b>CRIDA</b>	Project Member	03/05/2022

### Reviewers internal to the project

Name / Beneficiary	Position / Title	Date
J.M. Cordero / <b>CRIDA</b>	Project Coordinator	31/05/2022
R. Rodríguez / <b>CRIDA</b>	Project Coordinator Alternate	31/05/2022

### Approved for submission to the SJU By - Representatives of all beneficiaries involved in the project

Name / Beneficiary	Position / Title	Date
J.M. Cordero / <b>CRIDA</b>	Project Coordinator	31/05/2022
Antonio Gracia / <b>BRTE</b>	Project Member	31/05/2022
Ian Crook / <b>ISA</b>	Project Member	31/05/2022
Gennady Andrienko / <b>Fraunhofer</b>	Project Member	31/05/2022
George Vouros / <b>UPRC</b>	Project Member	31/05/2022
Hugo Salinas / <b>INDRA</b>	Project Member	31/05/2022

### Rejected By - Representatives of beneficiaries involved in the project

Name and/or Beneficiary	Position / Title	Date
-------------------------	------------------	------

### Document History

Edition	Date	Status	Name / Beneficiary	Justification
00.00.01	03/05/2021	Draft	E. Iglesias	New document.
00.00.02	17/05/2022	Draft	E. Iglesias/N. Valle	Update of sections 3, 4 and 5.
00.01.00	27/05/2022	Final	E. Iglesias/N. Valle	Update of section 6.
00.01.01	15/06/2022	Final	E. Iglesias	Integration of SJU review comments.

**Copyright Statement** © 2022 – TAPAS Consortium. All rights reserved. Licensed to SESAR3 Joint Undertaking under conditions.

# TAPAS

## TOWARDS AN AUTOMATED AND EXPLAINABLE ATM SYSTEM

This document is part of a project that has received funding from the SESAR Joint Undertaking under grant agreement No 892358 under European Union's Horizon 2020 research and innovation programme.



### Abstract

---

This document describes the different communication, exploitation and dissemination activities that have been achieved within the TAPAS project. Undertaken by TAPAS partners, these activities have been developed to guarantee the use and exploitation of TAPAS results and achievements. Dissemination and Exploitation was focused in ensuring that TAPAS outputs are in line with stakeholders' needs and expectations, linking the relevant participation of TAPAS partners with the SESAR Industrial Research and paving the way to further research and exploitation of TAPAS outputs.

## Table of Contents

Abstract .....	4
<b>1 Introduction</b> .....	<b>7</b>
1.1 Overview of the deliverable .....	7
1.2 Applicable reference material .....	7
1.3 Acronyms and Terminology .....	7
<b>2 Summary of TAPAS' CDE Plan</b> .....	<b>9</b>
2.1 Communication objectives and strategy.....	9
2.2 Dissemination objectives and strategy .....	9
2.3 Exploitation strategy and objectives.....	9
<b>3 Communication Activities</b> .....	<b>11</b>
3.1 List of Communication Channels and Activities .....	11
3.2 Channels .....	11
<b>4 Dissemination Activities</b> .....	<b>18</b>
4.1 List of Dissemination Activities.....	18
4.2 Description of the activities. ....	18
<b>5 Exploitation Activities</b> .....	<b>24</b>
<b>6 Success of CDE activities</b> .....	<b>27</b>
<b>7 References</b> .....	<b>30</b>

## List of Tables

Table 1. Channels list and links.....	11
Table 2. List of dissemination activities.....	18

## List of Figures

Figure 1. Home of TAPAS' Website. ....	12
Figure 2. TAPAS objectives page. ....	12
Figure 3. TAPAS consortium page. ....	13
Figure 4. TAPAS news, events and publications page. ....	13
Figure 5. TAPAS outcomes page.....	14
Figure 6. TAPAS contact us page. ....	14

Figure 7. TAPAS website footer.....	15
Figure 8. TAPAS Twitter banner. ....	15
Figure 9. Example of tweets. ....	16
Figure 10. TAPAS' LinkedIn profile. ....	16
Figure 11. Example of LinkedIn publications.....	17
Figure 12. TAPAS' newsletter. ....	17
Figure 13. TAPAS' SID poster. ....	19
Figure 14. TAPAS' SID video. ....	20
Figure 15. ER4 Workshop participants. ....	21
Figure 16. Example of outcome from the Workshop.....	22
Figure 17. Assistants to the last AB Workshop. ....	23
Figure 18. First page of the paper submitted to Applied Intelligence Journal.....	25

# 1 Introduction

## 1.1 Overview of the deliverable

The present deliverable describes the CDE (Communication, Dissemination and Exploitation) activities conducted during the TAPAS project, including a qualitative and quantitative analysis of its success.

The document provides first the context in which the CDE activities are framed, i.e., TAPAS' CDE Plan [1]. For the sake of completeness, a brief description of the communication, dissemination, and exploitation strategy and objectives of the project is provided. This information comes in what follows in Section 2 (Summary of TAPAS' CDE Plan). Interested readers are referred to [1] for more details.

In Section 3 (Communication Activities), Section 4 (Dissemination Activities), and Section 5 (Exploitation Activities) we describe the CDE activities conducted during the project, including a description of the channels used to broadcast the information.

In Section 6 (Success of CDE activities), an analysis of the impact of the CDE activities in terms of attachment to the plan, fulfilments of goals, and KPI target achievements is provided.

## 1.2 Applicable reference material

The CDE plan (Deliverable 6.1) was presented in [1]. This is the primary reference material interested readers are referred to. All the communication activities conducted have followed such a plan. The plan satisfies the content and activities identified in Section 3.10 of the Exploratory Research (ER) Project Execution Guidelines document [2], the article 38.1 of the Grant Agreement concerning the communication activities of the partners, and the instructions provided in the H2020 Communication Guide with regard to the communication strategy [3]. It is also compliant with the H2020 Guidelines on open access to research data. Unless otherwise stated in this PMP, the execution of the project will be fully compliant with the latest version of the S2020 Project Handbook available in STELLAR Program Library [2]. It is also compliant with the SJU slides used for the KoM [4].

## 1.3 Acronyms and Terminology

Term	Definition
AI	Artificial Intelligence
ANS	Air Navigation Systems
ATC	Air Traffic Control
ATCO	Air Traffic Controller
ATFCM	Air Traffic Flow and Capacity Management
ATM	Air Traffic Management
CD&R	Conflict Detection & Resolution
EASA	European Aviation Safety Agency

ER	Exploratory Research
Horizon 2020	EU Research and Innovation programme implementing the Innovation Union, a Europe 2020 flagship initiative aimed at securing Europe's global competitiveness.
IPRs	Intellectual Property Rights
KPA	Key Performance Area
ML	Machine Learning
SESAR	Single European Sky ATM Research Programme
SJU	SESAR Joint Undertaking (Agency of the European Commission)
SJU Work Programme	The programme which addresses all activities of the SESAR Joint Undertaking Agency.
SESAR Programme	The programme which defines the Research and Development activities and Projects for the SJU.
TRL	Technology Readiness Level
VA	Visual Analytics
XAI	Explainable Artificial Intelligence
WP	Work Package

## 2 Summary of TAPAS' CDE Plan

---

D6.1 (Communication, Dissemination and Exploitation Plan) was submitted and approved by SJU. The deliverable detailed the communication and dissemination plan, including exploitation matters, for TAPAS project. It identifies a focal contact for communication purposes. The deliverable includes three project key messages and a short description to be broadcasted in different media with the aim at making the project understandable at a first glance. It states the Dissemination and Exploitation objectives. The deliverable also described the intended communication, dissemination, and exploitation strategy to reach the established goals. This strategy included the communication target audiences, communications channels and dissemination means (including the project's website, the social media, etc), the open-to scientific publications, and the strategy to engage different stakeholders. Finally, a detailed communication and dissemination plan of activities was presented.

### 2.1 Communication objectives and strategy

The goal of the Communication Plan is to promote the project and its results. For this purpose, the plan presented in this section defines clear objectives and sets out a specific strategic planning for the communication activities in a strategic and effective manner.

The established communication objectives were:

- To optimise the information flow among the project members and organize an efficient communication between involved stakeholders;
- To broadcast the project to the affected target audiences and main stakeholders, including other Exploratory Research and SESAR2020 projects;
- To inform and communicate the project results to the interested policy body.

The communication strategy supported the exploitation of project results, focusing on the coordination of the outreach and dissemination activities necessary to achieve the project exploitation targets and promoting the work done during the project by using appropriate and useful tools, methods and channels.

### 2.2 Dissemination objectives and strategy

The dissemination of scientific discoveries is one of the inherent activities of TAPAS project, whose results aimed at being general principles for deploying AI/ML automation in ATM.

Regarding the dissemination objectives, they have changed as the project progressed. At the beginning of the project, dissemination focused specially on catching the interest of target stakeholders and getting their feedback to ensure that their inputs feed TAPAS activities. Later on, dissemination priorities gradually moved towards the publication of results to ensure their further exploitation.

### 2.3 Exploitation strategy and objectives

The exploitation goals are linked with the utilization of TAPAS' results in further research activities and in developing enhanced prototypes that will improve the ones developed within the scope of the project.

The main results of TAPAS achieved during the project have been:

1. Principles for transparency in AI/ML automation in ATM domain
2. Reference of XAI methods applicable in ATM domain
3. Reference on visualization in Visual analytics methods in ATM domain.
4. ATFCM and CDR prototype based on XAI and VA techniques

As established in CDE Plan [1], the exploitation strategy was divided into three main areas:

1. Outputs. It has taken into account the basic principles and the formulated Technology Concept, as well as general guidelines for further applications.
2. Documents. Proper technical reports (both intermediate and final deliverables) and research papers to make available to the community the outputs of the project have been generated.
3. Users. This area focused on the exchange of information of the TAPAS achievements among the projects and the potential users of the results. In this way, it has been very important for this area, to take advantage of the Advisory Board.

Finally, CDE plan also described the main exploitation objectives as: use of TAPAS outcomes beyond TAPAS project lifecycle in other different projects as a baseline for further developments in automation and application of XAI/ML and VA techniques and use of Principles for transparency in AI/ML automation in ATM domain to be used by the industry when developing new automated systems.

## 3 Communication Activities

Different communications activities have been conducted during the project. They follow the CDE plan (D6.1 [1]), which included a set of clear objectives to be covered by a planned strategy; differentiated target audiences; selection of the appropriate timeliness and communication means for each of the target audiences.

### 3.1 List of Communication Channels and Activities

Channel	Link
TAPAS Website	<a href="https://tapas-atm.eu/">https://tapas-atm.eu/</a>
TAPAS Twitter	<a href="https://twitter.com/TAPAS_SESAR_ER4">https://twitter.com/TAPAS_SESAR_ER4</a>
TAPAS LinkedIn	<a href="https://es.linkedin.com/in/tapas-project-744b3b208">https://es.linkedin.com/in/tapas-project-744b3b208</a>
SESAR newsletter	<a href="https://www.sesarju.eu/news/explainable-ai-key-unlocking-potential-automation-air-traffic-management">https://www.sesarju.eu/news/explainable-ai-key-unlocking-potential-automation-air-traffic-management</a>

Table 1. Channels list and links.

### 3.2 Channels

#### 3.2.1 TAPAS Website

The project website is <https://tapas-atm.eu/>. In the header, it contains the logo of the project, as well as the title and acronym together with a brief description of TAPAS and its main high-level objectives; it also includes links to the different social media (Twitter, LinkedIn). In the upper bar, there is a menu with links to the different parts of the webpage: Objectives, Consortium, News and Publications, Outcomes and Contact Us. See Figure 1

Once the user clicks on the different links of the menu, he/she reaches all the sites included in the web. See Figure 2 to Figure 6.

Finally, in the footer of the page the funding acknowledgement, including the EU emblem and SJU logo, as indicated in the GA has been included. See Figure 7.

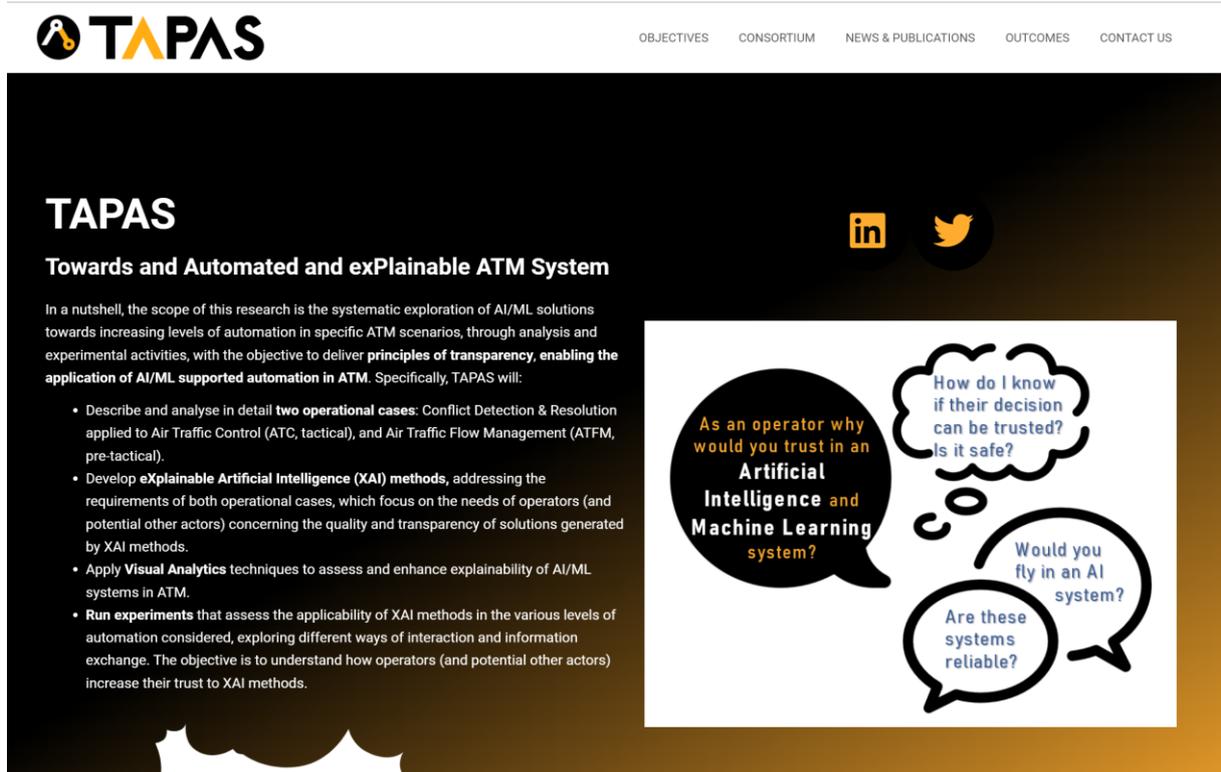


Figure 1. Home of TAPAS' Website.

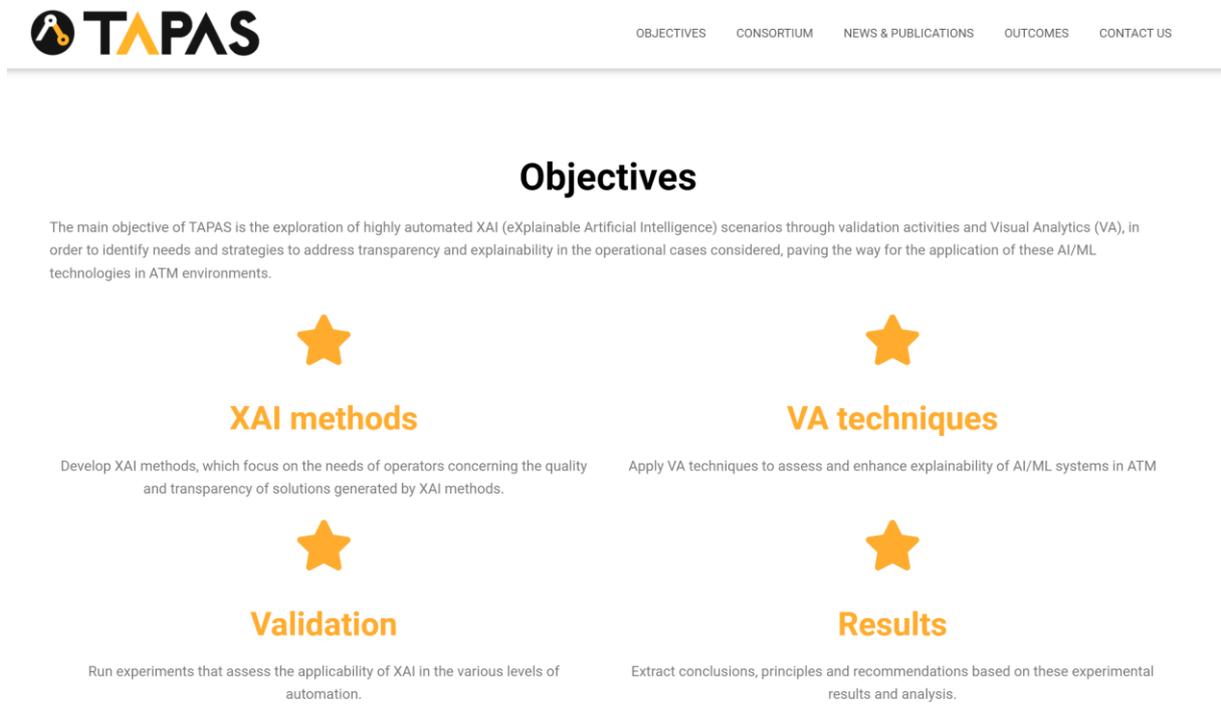


Figure 2. TAPAS objectives page.

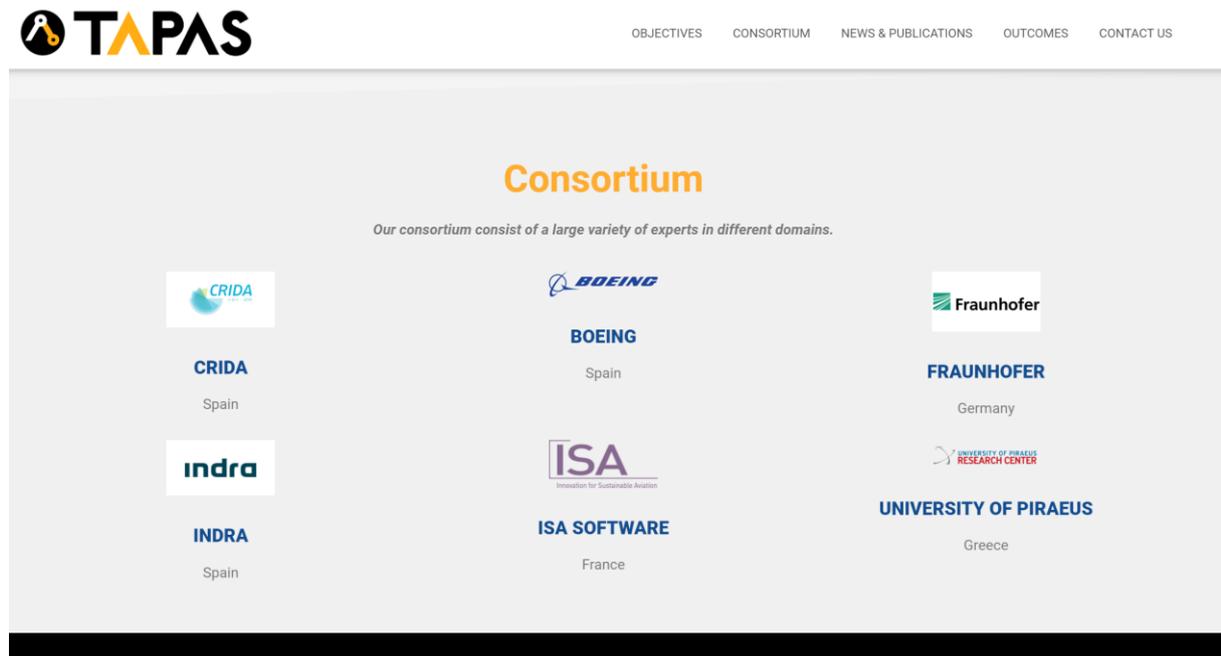


Figure 3. TAPAS consortium page.

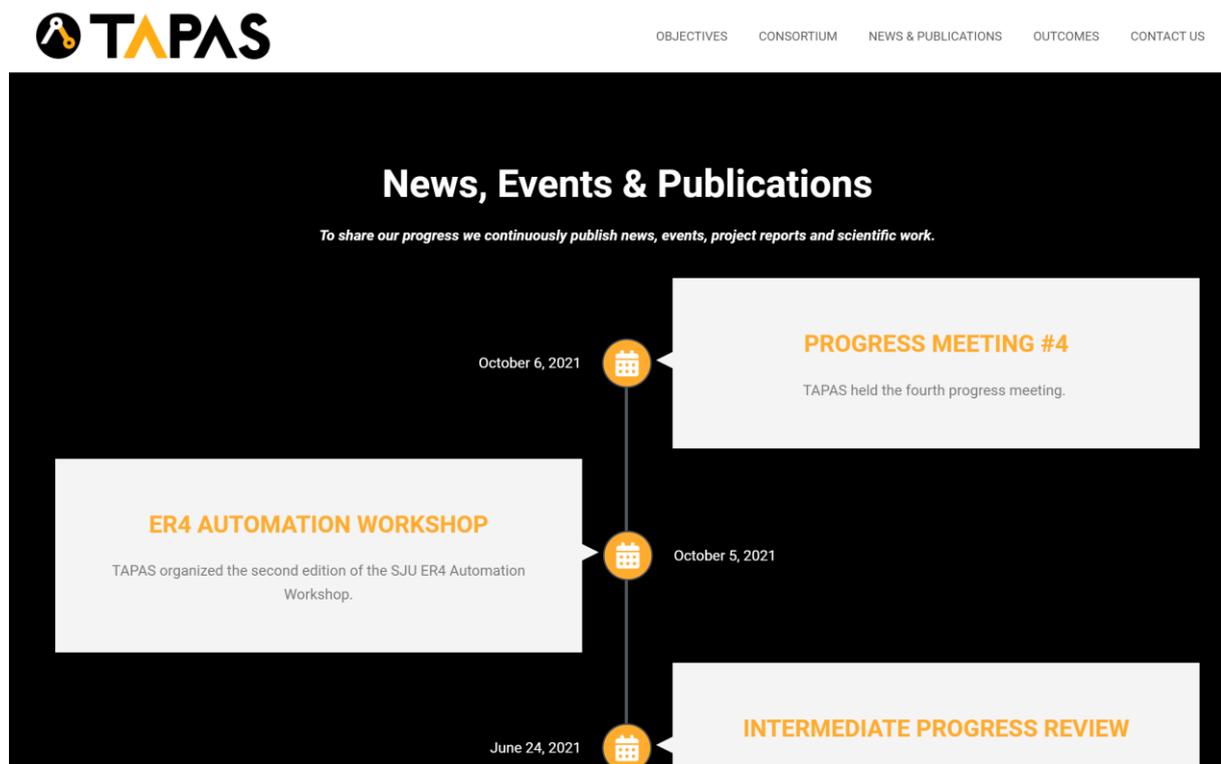


Figure 4. TAPAS news, events and publications page.

## Outcomes

### Deliverables

- D2.1 TAPAS Use Cases Description
- D2.2 Consolidated Requirements and Functional Roadmap
- D3.1 Use Cases Transparency Requirements
- D3.2 Principles for Transparency in AI/ML automation in ATM (Interim)
- D4.1 TAPAS Integrated Prototype (Interim)
- D4.2 Reference of XAI Methods (Interim)
- D4.3 Visualisations and Visual Analytics Methods (Interim)

Figure 5. TAPAS outcomes page.

## Contact us

For further information about the TAPAS project, please do not hesitate to contact us by filling out the following form:

First Name \*

Last Name \*

Email Address \*

Comments / Questions \*

Figure 6. TAPAS contact us page.

And follow us on our social media:

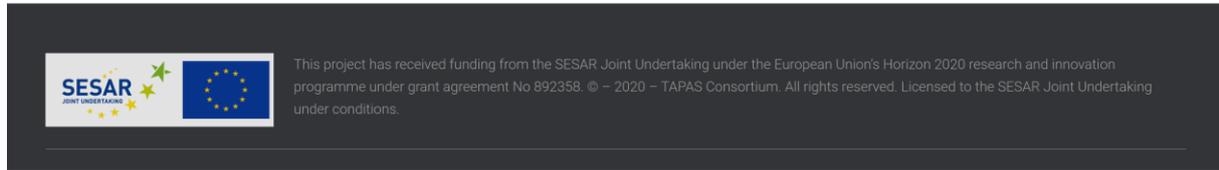


Figure 7. TAPAS website footer.

### 3.2.2 TAPAS Twitter

TAPAS created a profile in Twitter, whose link is [https://twitter.com/TAPAS\\_SESAR\\_ER4](https://twitter.com/TAPAS_SESAR_ER4), a communication channel intended to target the general public.



Figure 8. TAPAS Twitter banner.



Figure 9. Example of tweets.

### 3.2.3 TAPAS LinkedIn

TAPAS also created a profile in LinkedIn (<https://es.linkedin.com/in/tapas-project-744b3b208>) to wider the target audience.

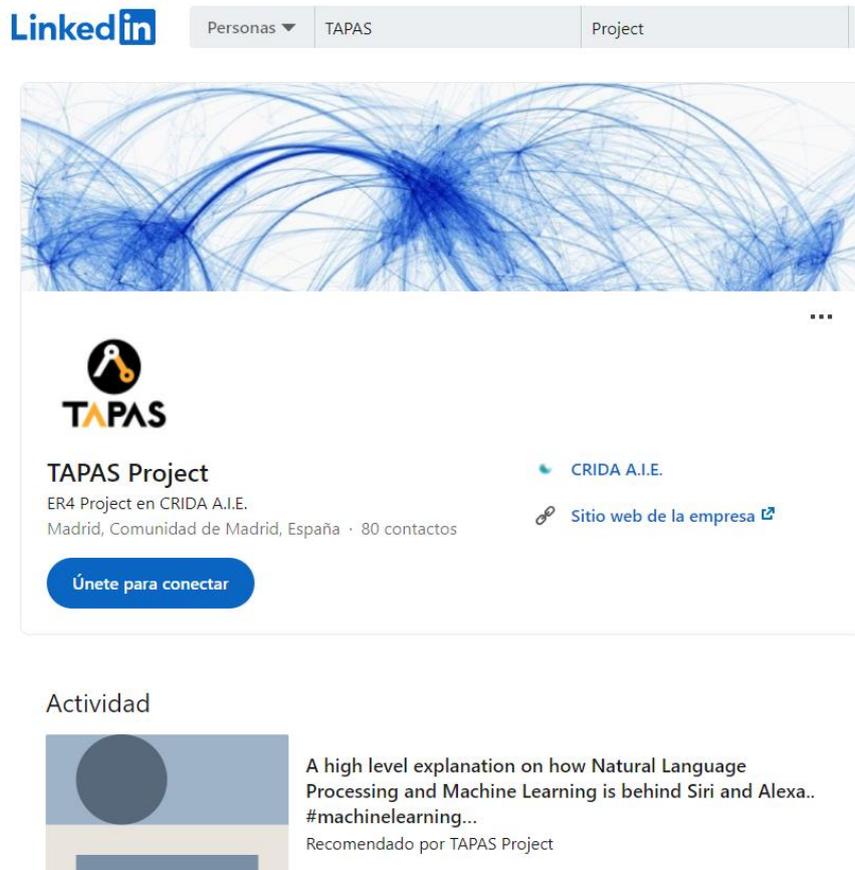


Figure 10. TAPAS' LinkedIn profile.

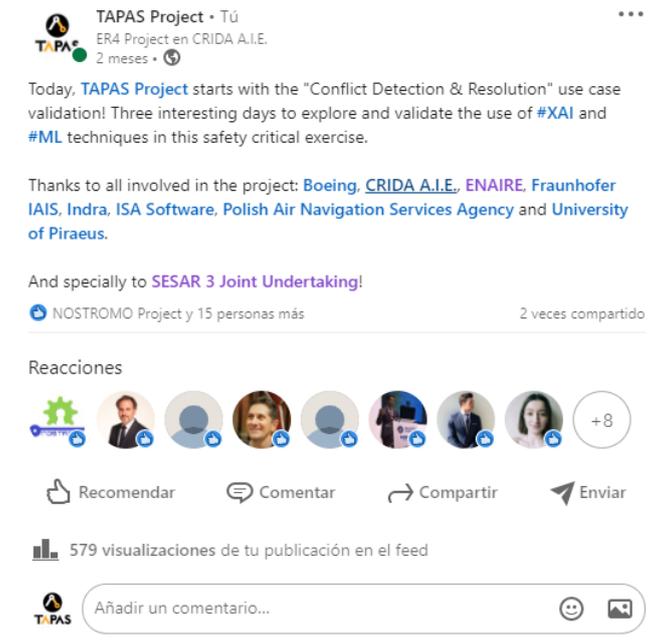
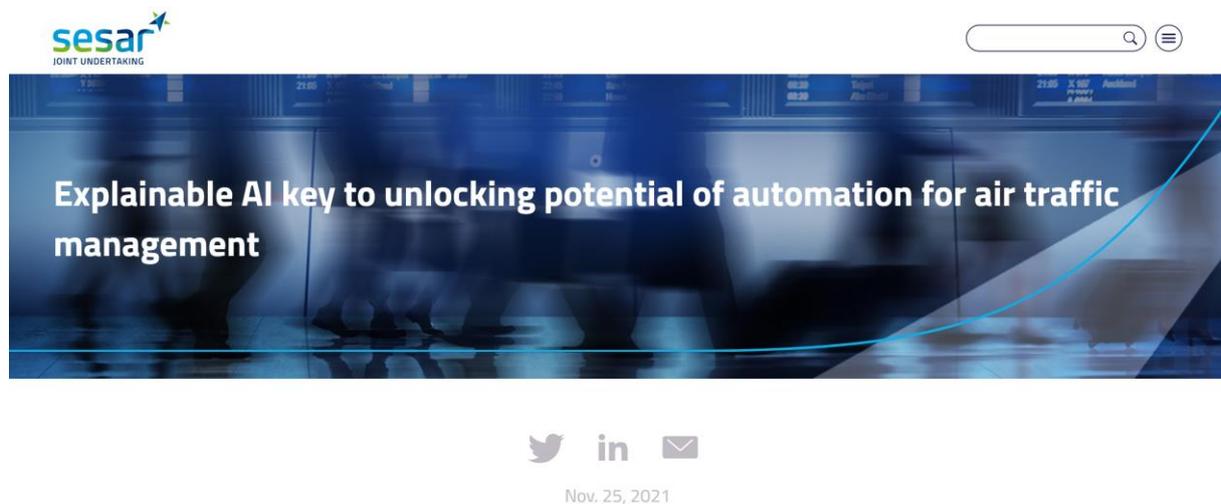


Figure 11. Example of LinkedIn publications.

### 3.2.4 SESAR newsletter.

TAPAS published a newsletter on 25<sup>th</sup> of November 2021, within the SESAR website. It described how applications of explainable artificial intelligence can improve trust in automated ATM systems.



Researchers in the SESAR JU project, TAPAS, have completed a series of tests showing how applications built using explainable artificial intelligence can improve trust in humans operating automation-enhanced air traffic management (ATM) systems. The algorithms will be now be adapted further to research AI-based automation support for in other ATM domains.

Figure 12. TAPAS' newsletter.

## 4 Dissemination Activities

### 4.1 List of Dissemination Activities.

Following the dissemination plan (D6.1 [1]) with the objective of maximising scientific impact and scientific excellence, different dissemination activities have been conducted during the project. See Table 2.

Activity	Brief Description
SESAR Innovation Days 2020.	<a href="#">Poster</a> and <a href="#">video</a> .
ER4 Automation Workshop. First Edition.	Presentation of TAPAS Project.
ER4 Automation Workshop. Second Edition.	Organization of the Workshop and presentation of TAPAS Project.
Advisory Board Workshops.	Organization of the Workshops and presentation of the main outcomes to the AB experts.
Digital Academy Webinar.	Participation in the Digital Academy Webinars organised by SESAR.

Table 2. List of dissemination activities.

### 4.2 Description of the activities.

#### 4.2.1 SESAR Innovation Days 2020.

TAPAS project participated at the 2020 SESAR Innovation days, Dec. 7-10, 2020. A poster (see Figure 13) and a video presentation (see Figure 14) were created. Everything was incorporated in TAPAS' virtual booth.

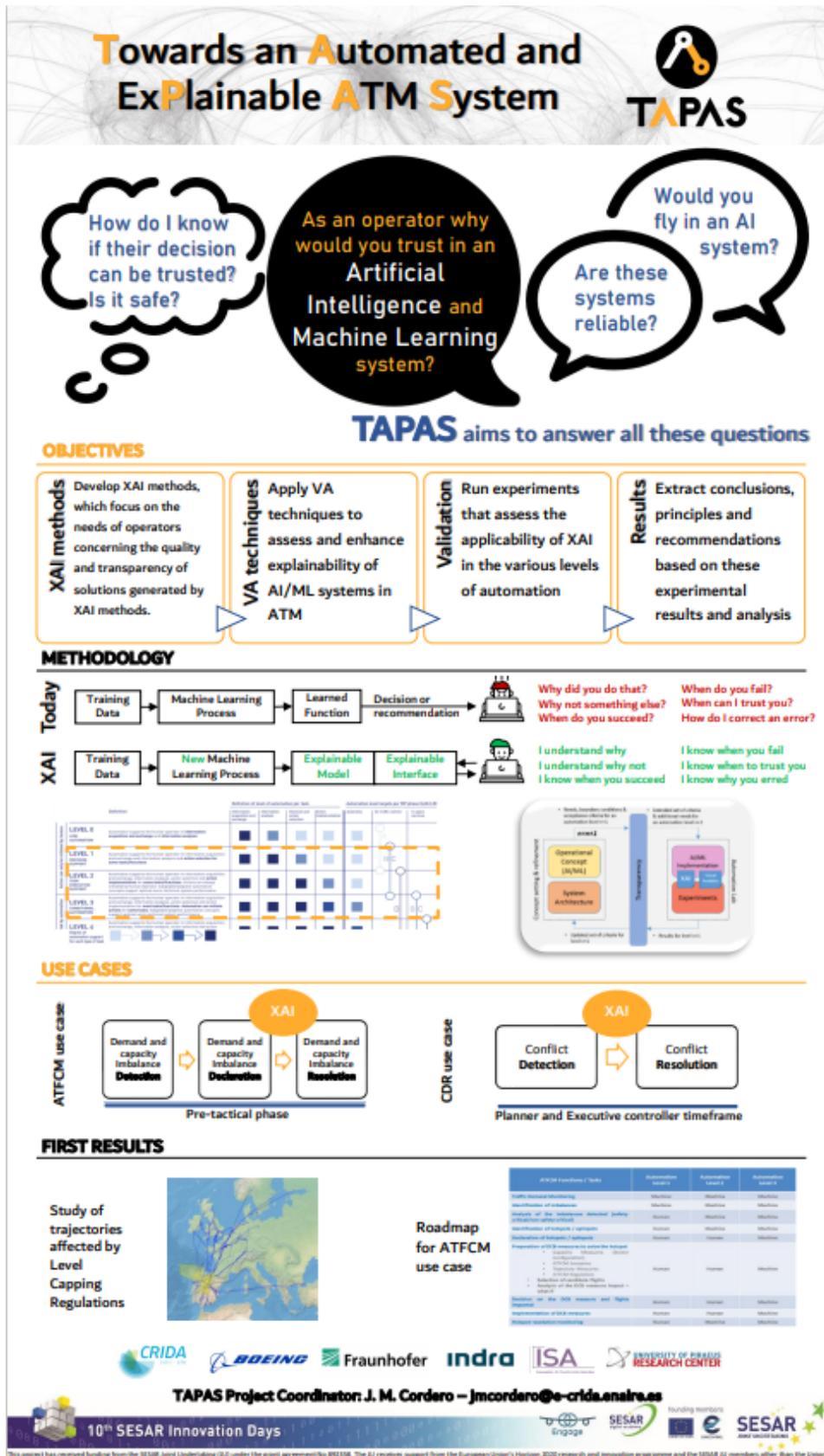


Figure 13. TAPAS' SID poster.



## USE CASES

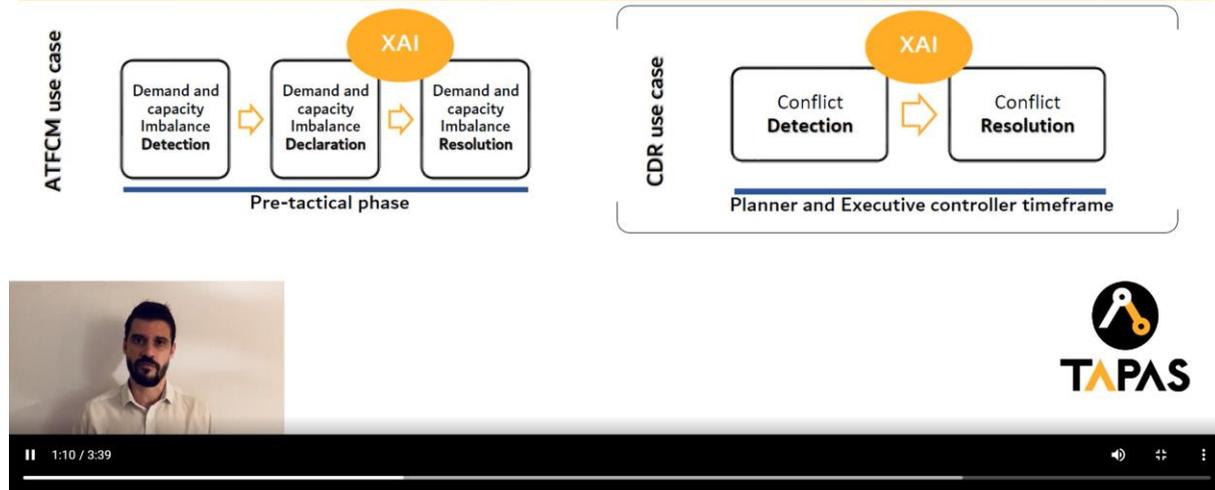


Figure 14. TAPAS' SID video.

### 4.2.2 ER4 Automation Workshop. First Edition.

On 8<sup>th</sup> of March 2021, the first edition of the ER4 Automation Workshop was held. The overall goal of this workshop was to identify all commonalities and possible collaborations among all the automation related projects. The session was moderated by Alessandro Prister and Andreas Hasselberg.

During the Workshop, José Manuel Cordero, Project Coordinator, gave an overview of TAPAS project and participated in the discussions. Moreover, several TAPAS partners presented some technical aspects of the project.

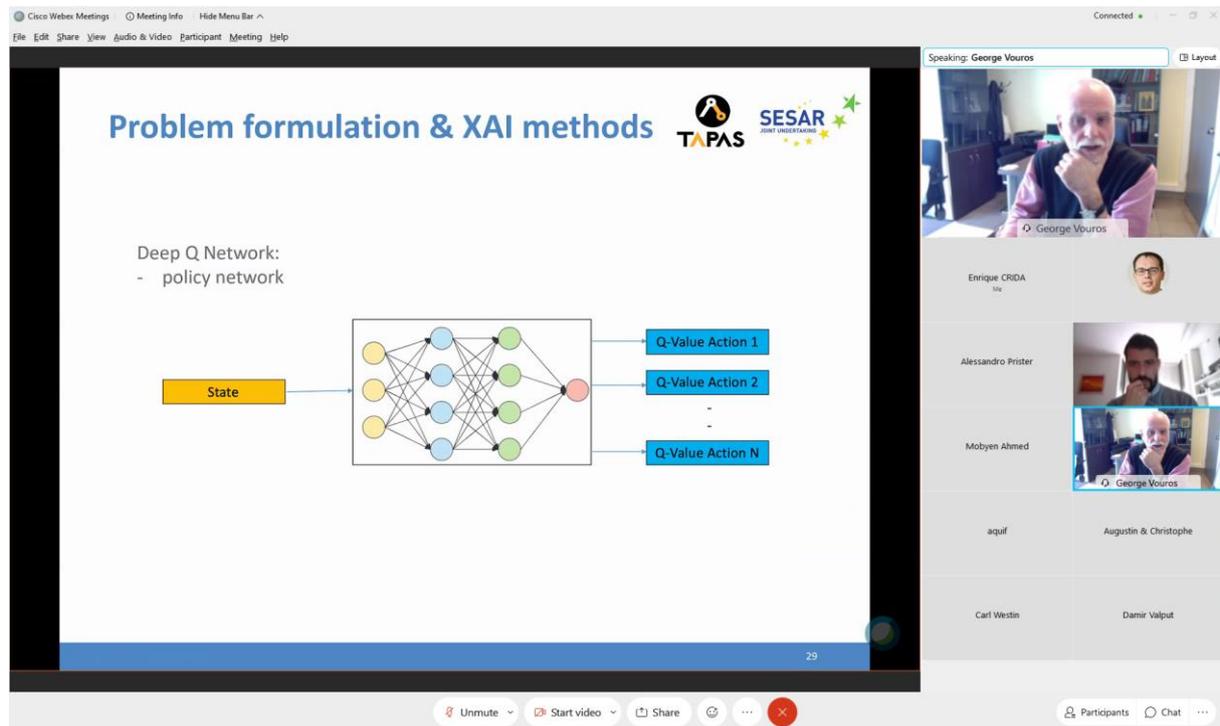


Figure 15. ER4 Workshop participants.

#### 4.2.3 ER4 Automation Workshop. Second Edition.

On 5<sup>th</sup> of October 2021, the second edition of the ER4 Automation Workshop was held. In this case, the discussions were conducted by Enrique Iglesias, WP6 leader of TAPAS project. This session was split into two different parts:

1. First part with the presentation of the first results of all the projects involved in the Workshop.
2. Second part that provoked the discussion among all the partners with the following objectives:
  - a. To share outcomes, issues and lessons learnt.
  - b. To discuss about dataset generation for AI/ML in ATM.
  - c. To determine potential fields to use Automation in ATM.
  - d. Next steps.

Figure 16 shows as an example the main outcome of the first topic of the discussion.

# First Interactive Discussion



Objective: To share outcomes, issues and lessons learnt.

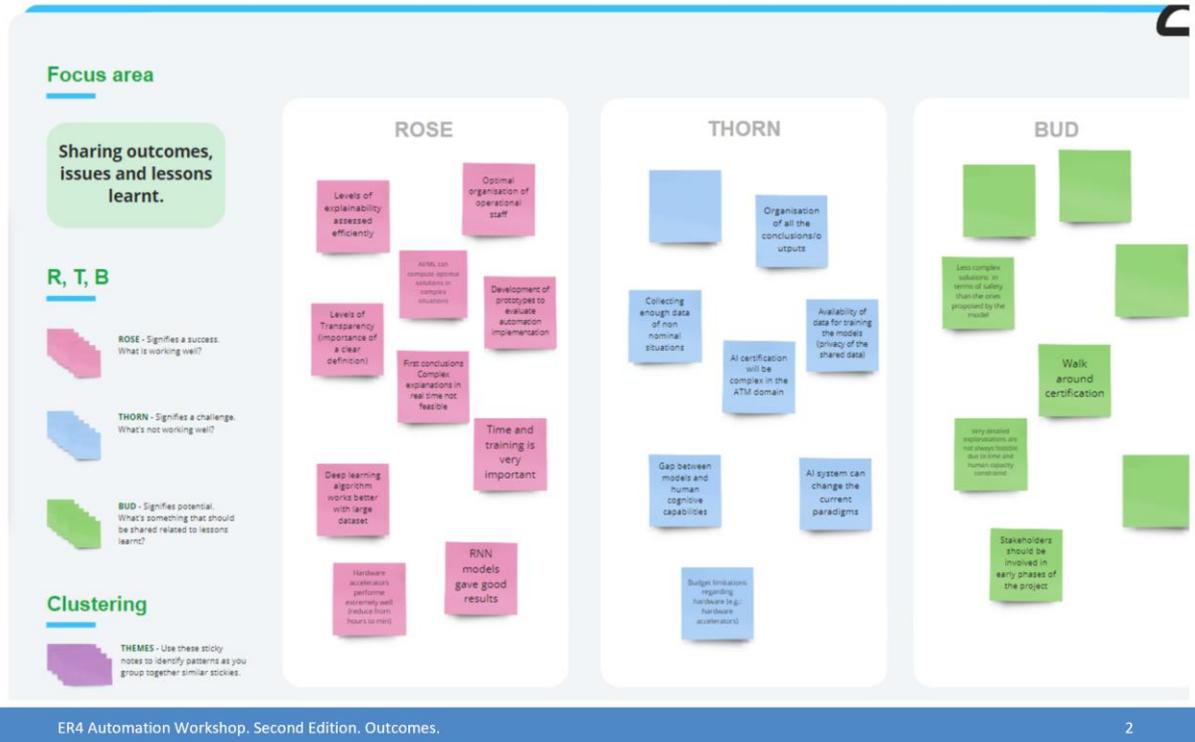


Figure 16. Example of outcome from the Workshop.

## 4.2.4 Advisory Board Workshops

TAPAS organised four different workshops with its Advisory Board: September 10<sup>th</sup>, 2020, March 1<sup>st</sup>, 2021, January 17<sup>th</sup>, 2022 and May 19<sup>th</sup>, 2022. In these dates, the outcomes of the projects were shared and all the interesting points of view of the different experts involved in the AB were taken into account in the following developments of TAPAS.





Figure 17. Assistants to the last AB Workshop.

#### 4.2.5 Digital Academy Webinar

TAPAS participated in the SESAR Digital Academy Webinar titled “Digital Solutions for Resilient ATM”, held on 28<sup>th</sup> of May 2022, where the main outcomes of the Conflict Detection and Resolution (CD&R) use case were presented. Moreover, first conclusions to the project were presented.

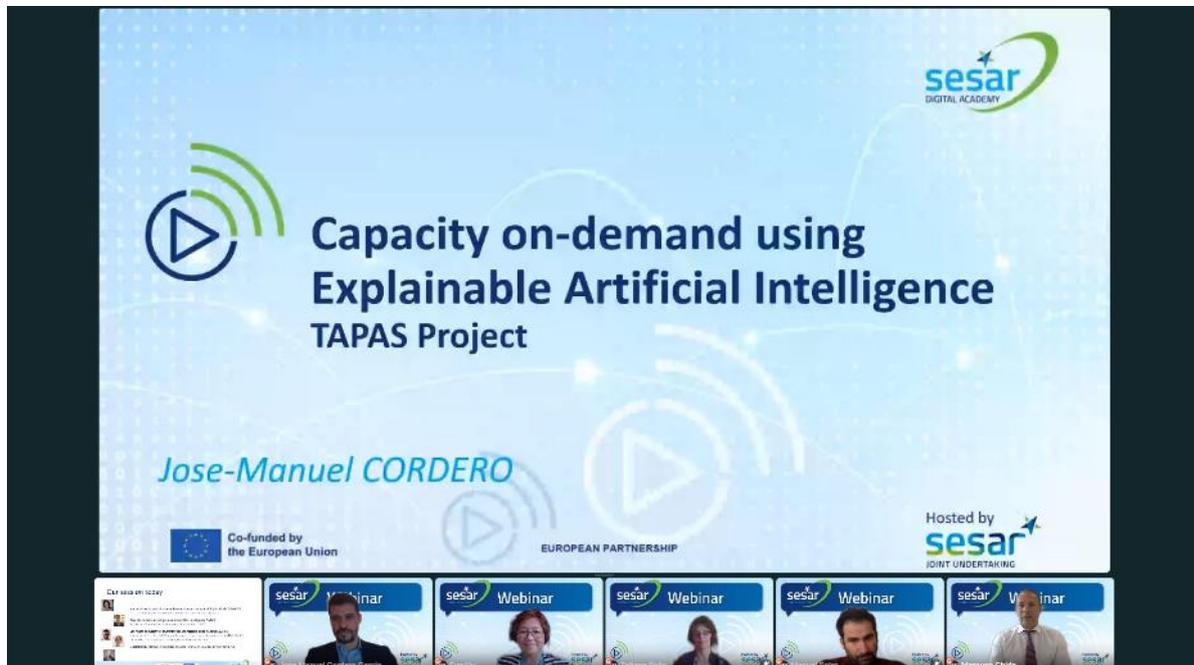


Figure 18. Participation in SESAR Digital Academy Webinar.

## 5 Exploitation Activities

In the CDE Plan (D6.1 [1]), it was identified the exploitation interests of each of the partners managing IPRs and data sharing to ensure the timely conduction of intended research activities and taking the proper actions to protect particular result.

### 5.1.1 List of Exploitation Activities

Activity	Brief Description
XRL Survey.	<b>Explainable Deep Reinforcement Learning: State of the Art and Challenges.</b> George A. Vouros, University of Piraeus, Greece.
XAI at ATFCM	<b>Explaining Deep Reinforcement Learning Decisions in Complex Multi Agent Settings: Towards Enabling Automation in Air Traffic Flow Management.</b> Theocharis Kravaris et al.
VA paper.	<b>Supporting Visual Exploration of Iterative Job Scheduling.</b> Gennady and Natalia Andrienko et al.

### 5.1.2 XRL Survey.

On March 2022, the Association for Computing Machinery (ACM) accepted the survey produced by George Vouros, from the University of Piraeus, titled “Explainable Deep Reinforcement Learning: State of the Art and Challenges”. By clicking on this [link](#), the reader will have full access to the document.

### 5.1.3 XAI at ATFCM

In May 2022, the last version of the paper “Explaining deep reinforcement learning decisions in complex multi agent settings: towards enabling automation in air traffic flow management” was submitted after the approval by the Applied Intelligence Journal with minor changes (including bios and photos from the authors). Once the link to the paper is public, it will be included in the document.

# Explaining Deep Reinforcement Learning Decisions in Complex Multiagent Settings: Towards Enabling Automation in Air Traffic Flow Management.

Theocharis Kravaris<sup>a</sup>, Konstantinos Lentzos<sup>a</sup>, Georgios Santipantakis<sup>a</sup>, George A. Vouros<sup>a</sup>

<sup>a</sup>University of Piraeus, Piraeus, Greece e-mail: georgev@unipi.gr

---

## Abstract

With the objective to enhance human performance and maximize engagement at all times during the performance of tasks, we aim to provide advanced automation levels for decision making and task execution support in complex and large-scale multiagent settings, while advancing trustworthiness to systems. Towards these goals, this paper presents a deep multi-agent reinforcement learning method for resolving demand - capacity imbalances in real-world Air Traffic Management settings with thousands of agents. Agents comprising the system are able to jointly decide on the demand measures to be applied to resolve imbalances, while they provide explanations on their decisions, which are rendered via appropriate visualizations. The paper presents how major challenges of scalability and complexity are addressed, and provides results from evaluation and validation exercises involving human experts.

**Keywords:** Air traffic management, multiagent deep reinforcement learning, interpretability, stochastic decision trees, explainability, visualization

---

## 1. Introduction

Complex and large-scale multiagent problem settings typically involve a large number of self-interested agents with interacting, and potentially conflicting decisions / actions, and dynamic avalanches of actions' effects in space and time, affecting the state of others. Such settings appear in various real-life domains (urban traffic congestion, air traffic management and network routing), with emerging challenges. This class of problems comprises interesting real-world congestion problems, which have drawn much attention in the AI and autonomous agents research (e.g. [2],[5],[24],[51],[54]) for at least two decades [12] and have been the focus of game theoretic models for much longer [38][28].

Aiming to contribute to the automation of operations in a complex and large-scale multiagent setting, we need to meet not only domain-specific objectives, but also objectives regarding human performance and engagement. In this context, a new important challenge emerges, regarding trustworthiness in the system, in the sense that operators should be comfortable relinquishing control to it, given appropriate explanations on system's decision making [26]. Major factors affecting trustworthiness include quality of automated solutions, as well as quality of explanations provided. As far as we know, while many works address the computation of problems' solutions in complex multiagent settings, there is not any work that addresses the dual challenge of providing (a) qualitative solutions in large scale settings and (b) coherent and concise explanations regarding agents' joint decision making. Scalability and complexity are the major challenges to be addressed

in meeting the objectives.

In this work we address the challenging issues of scalability and complexity towards advancing automation in real-world multiagent settings with thousands of agents, aiming to (a) compute qualitative solutions to congestion problems and (b) provide explanations on how individual agents' decisions jointly affect their common setting.

Specifically, in the air-traffic management (ATM) domain, congestion problems arise naturally whenever demand of airspace use exceeds capacity, resulting to "hotspots". This is known as the *Demand - Capacity Balance (DCB) problem*. Hotspots are resolved via airspace management or flow management solutions, including regulations that generate delays and re-routings to flights, causing unforeseen effects for the entire system, and increasing the factors of uncertainty regarding the scheduling of (ground and airspace) operations. For instance, flight delays cause the introduction/increase of time buffers in operations' schedules, and may accumulate demand for resources within specific periods per day. These effects are translated into costs and loss of reliability, increasing airlines' environmental footprint and affecting customers' satisfaction.

Increased demand for airspace use is the major factor for unprecedented measures applied to flights (over 90% in some airspaces) [13]. It got significantly worse in 2018 [16] when delays across Europe more than doubled, due to the increase in traffic, among other factors. In general, all performance analysis and studies lead to the idea that the ATM system in the post-Covid-19 era was very close to, or already at, a saturation level. These issues, in conjunction to the foreseen increase in air traffic [14][15] impose

Preprint submitted to XYZ

September 24, 2021

Figure 19. First page of the paper submitted to Applied Intelligence Journal.

#### 5.1.4 VA paper.

Several project members led by Gennady and Natalia Andrienko produced a Visual Analytics related paper titled “Supporting Visual Exploration of Iterative Job Scheduling” , which has been approved and published in the Journal “IEEE Computer Graphics and Applications”. By following this [link](#), the reader will have access to the abstract of the document.

## 6 Success of CDE activities

Activity	Description	KPIs and targets	Compliance of KPIs and targets
Workshops	Organised three different workshops to promote the use of the project outputs and results	+3 workshops organized by TAPAS.	<b>POK.</b> Currently, one workshop has been organised, in the context of ER4 Automation Workshops. However, two additional workshops have been planned: once after the summer break+ (it was planned during the WAC but Maturity Gate was scheduled at the same time), and one during SIDs 2022 in Budapest.
		+2 stakeholders reached and interested in further exploitation.	<b>OK.</b> Several universities and research centres (University of Zagreb, Deepblue, etc) are interested in TAPAS results and further research.
		+7 key Stakeholders contacted to make TAPAS results known.	<b>OK.</b> More than seven stakeholders have been contacted to explain TAPAS outcomes: CAAs, Industry, Universities, etc.
Conferences and presentations	Attend to different conferences to raise awareness about TAPAS results and challenges, and get feedback on expectations	+6 conferences and seminars in which TAPAS project will be presented.	<b>POK.</b> TAPAS has participated in SIDs 2020, AB workshops and SESAR webinars. The total number of conference and seminars has been 6: 1 SIDs seminar, 4 AB workshops and 1 SJU Digital Academy Webinar. However, this KPI has been marked as POK, since TAPAS plan to

Activity	Description	KPIs and targets	Compliance of KPIs and targets
			participate in more conferences and seminars.
		+4 workshops organized by other projects in the ER4 call or by the SJU with TAPAS' participation.	OK. TAPAS has participated in workshops organised by MAHALO and ARTIMATION.
		+50 attendees to TAPAS's sessions in seminars and conferences	OK. During the SESAR Digital Academy Webinar we reached more than 50 attendees.
Scientific publications	Maximize the impact of the research and enable the value of results to be potentially wider than the original focus.	+3 TAPAS presence in Publications	OK. Currently, 3 scientific publications have been submitted, approved and published.
TAPAS Website	To communicate project achievements and announce workshops and latest news	Update at least once a month TAPAS website.	OK. The website has been maintained up to date every month, adding deliverables, calendar of events, etc.
		+200 unique website visitors throughout the project lifecycle	OK. TAPAS' website has reached more than 8500 visitors and more than 30800 visits.
Social Media	Use Twitter and LinkedIn to reach out to society and broadcast, TAPAS results and progress, work, workshops and other announcements.	One update per month in Twitter and LinkedIn	POK. TAPAS has reached the number of 20 publications both in LinkedIn and Twitter. According to KPI definition, TAPAS should have done one update per month, and considering the duration of the project until Maturity Gate (24 months), the number of publications should have been 24.

Activity	Description	KPIs and targets	Compliance of KPIs and targets
Leaflets, posters, press releases	Maximize the impact of the research and broadcast TAPAS results and achievements	+4 websites where TAPAS is placed	<b>OK.</b> TAPAS appears in SESAR website and in three websites related to scientific publications.
		+6 leaflets, posters or press releases published within TAPAS framework.	<b>POK.</b> Currently, one poster, one newsletter and one video have produced. However, TAPAS is working in the development of one CORDIS article, one leaflet and other newsletter.  By date of the submission of this document, only three elements have been published (one poster, one newsletter and one video). However, more activities have been planned, but since they are not finished, the compliance of this KPI has been marked as POK.
Email	To coordinate and communicate updates and other relevant information to all Consortium members and to communicate with members of other relevant SESAR Projects.	+1 progress meeting per semester to communicate TAPAS progress and general status, together with WP status and foreseeing risks.	<b>OK</b>
		+1 scheduled meeting between WPs that have dependencies between one another	<b>OK</b>
Meetings and teleconferences	To communicate TAPAS progress and general status and to coordinate activities among WP.	+1 progress meeting per semester to communicate TAPAS and WP progress and status.	<b>OK</b>
		+1 meeting between WPs that have dependencies	<b>OK</b>

## 7 References

---

- [1] TAPAS Dissemination, Exploitation, and Communication Plan, D6.1, Version 00.01.04, 24th June 2021.
- [2] Project Handbook of SESAR 2020 Exploratory Research Call H2020-SESAR-2019-2 (ER4) (Programme Execution Guidance), Edition 03.00.00, March 2019.
- [3] TAPAS Project Grant Agreement number: 892358, 2020, call H2020-SESAR-2019-2, topic SESARER4-01-2019.
- [4] SJU slides, SESAR 2020 Communication and Dissemination, Kick-Off Meeting, June 2020.