Exploitation and Dissemination plan

D5.1

COTTON

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CAPACITY OPTIMISATION IN TRAJECTORY-BASED OPERATIONS

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Abstract

This document describes the exploitation and dissemination activities planned to be undertaken by COTTON partners. COTTON dissemination and exploitation activities have been identified and developed in order to ensure the proper usability and exploitation of COTTON delivered Operational Improvements. Dissemination and Exploitation is oriented to ensuring that its outputs fully satisfy stakeholders' needs, linking the relevant participation of COTTON partners within the SESAR industrial research and facilitating further research or operational exploitation of COTTON outputs.

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Executive Summary

The Exploitation and Dissemination plan aims at ensuring that project results are properly disseminated inside and outside the consortium to the proper audience, at the right moment and following effective means.

COTTON dissemination plan includes the dissemination objectives and the identification of the dissemination material. Additionally, it identifies the required dissemination activities by defining the need of a website, workshops with the stakeholders, conferences and publication for disseminate COTTON results.

COTTON dissemination plan also includes communication among the project partners and external communication to non-partners stakeholders. Moreover, dissemination will allow measuring acceptance of COTTON Operational Improvements and reusing them in other projects.

All dissemination and exploitation actions have been planned following the guidelines provided by the communication plan described in COTTON Project Management Plan.

1. Introduction

1.1. Purpose of the Document

The Exploitation and Dissemination plan aims at disseminating the key information generated during the project's lifetime and planning the exploitation of the project results.

COTTON dissemination plan includes the dissemination objectives, the identification of the dissemination material and the partners´ roles in the COTTON dissemination. Additionally, it identifies the required dissemination activities by defining the need of workshops with the stakeholders, the use of Internet resources, and the most suitable journals and conferences for publication COTTON results. In order to guarantee the accomplishment of the expected measures in dissemination activities, quantitative objectives and expected results in dissemination will be included in the dissemination plan.

COTTON exploitation plan includes the description of exploitable outcomes and the identification of the potential customers and actions taken to ensure the exploitable results satisfies the customer's needs and achieve enough dissemination.

All dissemination and exploitation actions have been planned following the guidelines provided by the communication plan described in COTTON Project Management Plan.

COTTON dissemination and exploitation plan has been developed in accordance with Articles 28 and 29 of the Grant Agreement. According to them:

- Each beneficiary must take measures to ensure 'exploitation' of its results by:
    a) using them in further research activities (outside the action);
    b) developing, creating or marketing a product or process;
    c) creating and providing a service, or
    d) using them in standardisation activities.

- Each beneficiary must 'disseminate' its results by disclosing them to the public by appropriate means including in scientific publications.

- A beneficiary that intends to disseminate its results must give advance notice to the other beneficiaries of — unless agreed otherwise — at least 45 days, together with sufficient information on the results it will disseminate.

    Any other beneficiary may object within — unless agreed otherwise — 30 days of receiving notification, if it can show that its legitimate interests in relation to the results or background would be significantly harmed. In such cases, the dissemination may not take place unless appropriate steps are taken to safeguard these legitimate interests.

- Each beneficiary must ensure open access (free of charge online access for any user) to all peer-reviewed scientific publications relating to its results.

1.2. Intended readership

This document is intended to be used by COTTON members.

1.3. Acronyms and Terminology

Term	Definition
ATC	Air Traffic Control
ATCo	Air Traffic Controller
ATM	Air Traffic Management
DAC	Dynamic Airspace Configuration
FCA	Flight Centric ATC
Horizon 2020	EU Research and Innovation programme implementing the Innovation Union, a Europe 2020 flagship initiative aimed at securing Europe's global competitiveness.
PMP	Project Management Plan
PMST	Project Management Support Team
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.
TBO	Trajectory-Based Operations
WP	Work Package

Table 1: Acronyms List

1.4. Project Introduction

COTTON (Capacity Optimisation in TrajecTory-based OperatioNs) project is addressing the SESAR 2020 Exploratory Research and very large scale demonstrations open call (H2020-SESAR-2016-2). Particularly, research topic ER3-03-2016 *"Optimised ATM Network Services: TBO"*, and specifically the challenge of exploring how the uncertainties associated with the agreed trajectory will impact the quality of the predictions – both volume and complexity of traffic demand – and the effectiveness of DCB processes regarding airspace management.

The main objective of COTTON is to deliver innovative solutions to maximise the effectiveness of the Capacity Management processes taking full advantage of the available trajectory information in a

TBO environment. COTTON will achieve the optimisation of these processes not only incorporating the trajectory uncertainty into an advanced model for demand and capacity balancing, but also integrating complexity and workload algorithms more suitable to the most innovative aspects of the SESAR 2020 solutions dealing with future airspace management – Dynamic Airspace Configuration (DAC) and Flight Centric ATC (FCA) –.

COTTON will assess the impact of its approach on the most relevant Key Performance Areas (KPAs) at local and European level by means of three fast-time simulations to test not only DAC and FCA solutions in isolation but also potential alternatives for their safe integration.

COTTON proposes to address the aforementioned challenge analysing and addressing the needs of existing approaches in complexity assessment and models for demand and capacity balancing to operate in TBO. Instead of starting from scratch, COTTON will take full advantage of existing complexity methodologies as well as innovative models for the prediction of trajectories' uncertainty, focusing its effort on researching how these models and methodologies can integrate the delivery of uncertainty-based complexity assessment as part of an advanced demand/capacity model.

This approach is feasible as COTTON has full access to existing SESAR complexity methodologies (algorithmic approach, Cognitive approach and Convergence-Lyapunov approach) and trajectories' uncertainty models thanks to the composition of its Consortium. COTTON will explore the opportunities to refine these models introducing new trajectory-based complexity metrics for supporting the most innovative aspects of DAC and FCA solutions. It should be noted that COTTON's approach, based on existing methodologies as starting point, would be beneficial to move faster and to facilitate the transference of findings into the SESAR industrial research where concepts such as complexity assessment based on the aforementioned methodologies were considered matured in non-TBO environments.

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2. Dissemination Material and Exploitable Results

2.1. COTTON Objectives

The main objective of COTTON project is to maximise the effectiveness of the Capacity Management processes in TBO taking full advantage of the available trajectory information. To achieve this goal, COTTON identifies the following three main sub-objectives:

- Improve the use of trajectory-based complexity and workload assessment to support Capacity Management enabled by Trajectory-Based Operations (TBO) including uncertainty.

- Identify and promote the benefits of Trajectory-Based Operations (TBO) to develop innovative demand/capacity models based on Dynamic Airspace Configuration (DAC) and Flight Centric ATC (FCA) solutions.

- Explore Dynamic Airspace Configuration (DAC) and Flight Centric ATC (FCA) solutions integration.

COTTON main objective is refined into several sub-objectives as follows:

COTTON WP	Objectives
WP1 Management	To ensure that the work performed is carried on time, within budget and with the required level of quality.
WP2 Complexity assessment in TBO	To overcome the limitations of existing complexity assessment approaches to support Capacity Management processes in a TBO environment.
	To refine the existing complexity methodologies and algorithms integrating uncertainty figures derived from the future TBO environment.
WP3 Advanced Capacity Management processes in TBO	To refine the SESAR2020 Capacity Management processes to address the inefficiencies and limitations derived from their implementation in a TBO environment, considering DAC and FCA solutions.
WP4 Validation of Capacity Management effectiveness	To conduct a feasibility study to confirm the potential usefulness and expected benefits of the refined Capacity Management processes as they are identified in WP3.
WP5 Exploitation and Dissemination	To elaborate and implement the actions required to ensure that the project's results are disclosed and used as much and as widely as possible.

Table 2: COTTON Sub-objectives

2.2. Dissemination and Exploitation Objectives

The objective of the project's dissemination activities is to ensure that COTTON Operational Improvements reach all relevant stakeholders and target group organizations.

More specifically, COTTON exploitation and dissemination related objectives are:

- To broadcast COTTON to the affected actors and identified stakeholders.

- To communicate COTTON results to target stakeholders in a two-way exchange in order to:

   o Obtain users' needs and expertise to be taken into account in COTTON activities;

   o Disseminate COTTON achievements to their potential users thus facilitating the evolution of the project´s solution to further maturity levels

The main differences between dissemination and exploitation are depicted in the following Figure 1. The stress is put on the objective, since dissemination is enabling the use of results while exploitation shall ensure the results are used. Therefore, exploitation audience must be precisely chosen so as to ensure that it is composed of groups and entities that are effectively making concrete use of results.
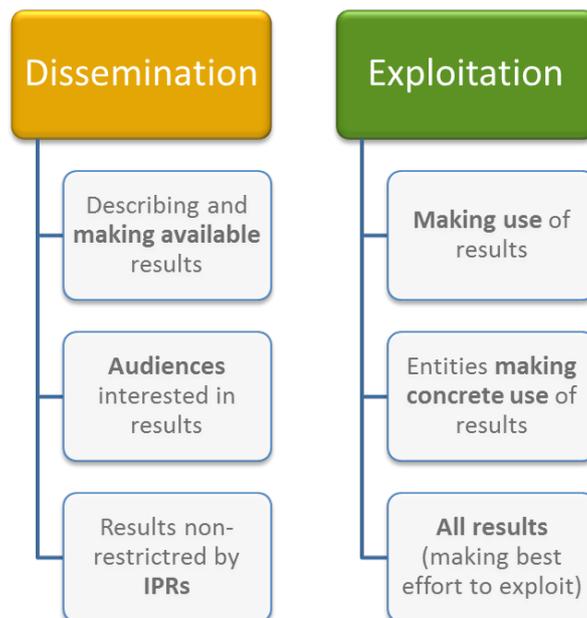

Figure 1: Dissemination versus Exploitation Activities

2.3. Dissemination Material

All the results of COTTON research will be contained in COTTON deliverables; moreover specific research results will also be either published in dedicated publications, presented in conferences, or both. COTTON Milestones indicate when intermediate results such as DCB or complexity algorithm improvements and improved models will be available. These intermediate results will also be used in

COTTON workshops or conferences in order to get stakeholders' feedback for the associated deliverables.

2.4. COTTON Benefits

The results obtained by COTTON project will have an impact in different stakeholders. These expected benefits are listed below:

Stakeholder Groups	Benefits
SJU Project Officer	- COTTON Progress toward expected results; - Project general status including foreseen or actual delays, resources usage, risks or issues, and other managerial aspects; - Content and timing of press releases and joint publications.
ANSPs	- Knowledge gained in Complexity and WL estimation in TBO; - Knowledge gained in managing uncertainty into Capacity Management process at local level.
EASA	- Suitability of COTTON solutions.
EU Commission	- Benefits of COTTON outcomes and their potential application.
R&D Centres	- I+D+i COTTON Operational Improvements.
Industry	- I+D+i Complexity and WL models; - I+D+i Demand and Capacity models.
Universities	- I+D+i COTTON Operational Improvements.
S2020 Projects	- Advances related with the DAC and FCA Solutions.
Other exploratory research projects	- Synergies with other solutions being developed under DCB Exploratory research projects.

Table 3: COTTON benefits for different stakeholder groups

2.5. Exploitable Results

The figure below describes the expected impacts and the qualitative and quantitative indicators that the project has identified to evaluate the achievement of these impacts linked to the project objectives and ambitions.
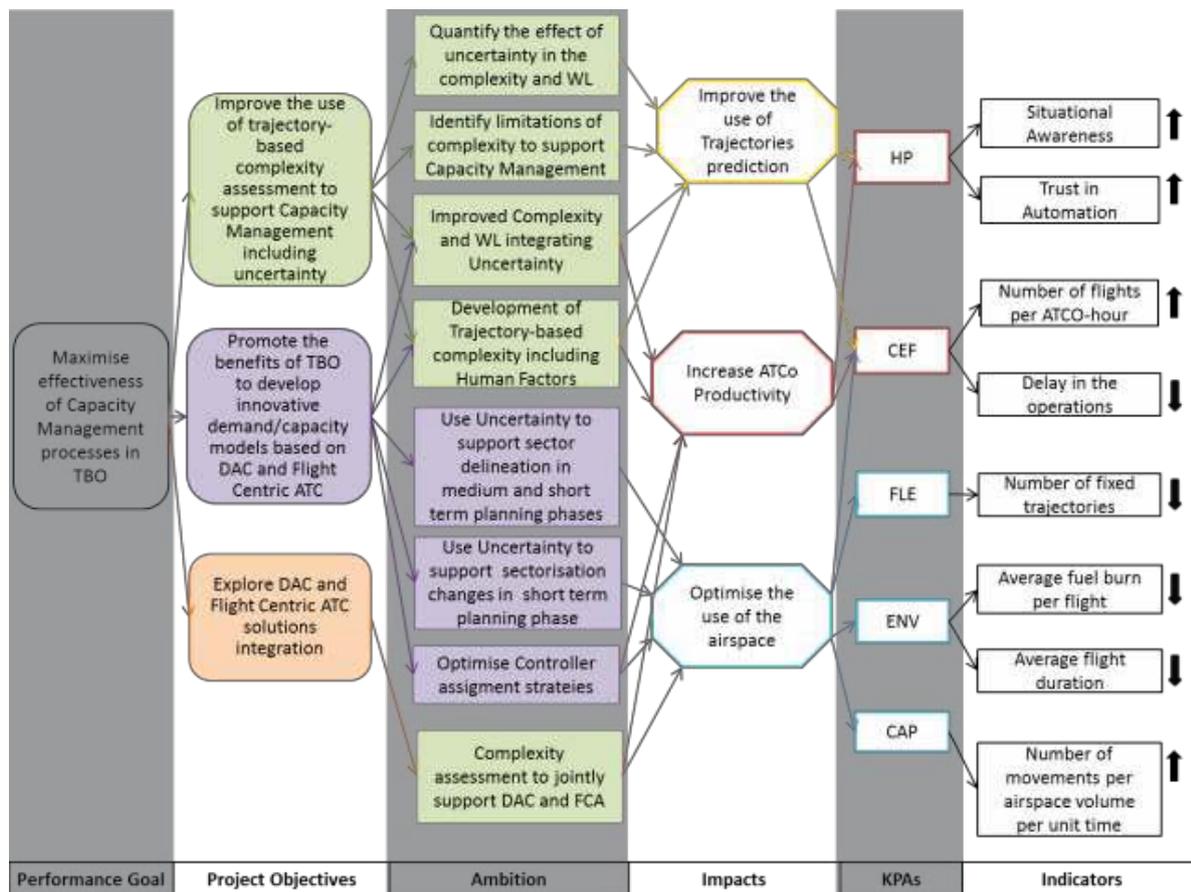
Figure 2: COTTON Benefit Impact Mechanisms

The expected impacts identified are detailed in the following paragraphs as well as the indicators that could be used to estimate their effect:

Optimise the use of the airspace

The optimisation of the airspace use could be obtained as a consequence of integrating the use of the confidence level into the demand and capacity model. The design of sectors and sector configurations in DAC taking into account the uncertainty of the predicted demand will allow a better adjustment of capacity to demand. An improved FCA in which the allocation of trajectories to controllers is based on reliable trajectory information - and taking into account the implied workload per trajectory - will contribute to this optimisation by allowing a better estimation of capacity in FCA areas. Finally, an improved complexity methodology to support DAC and FCA would allow designing airspace integrating DAC and FCA areas maximising capacity.

The effectiveness of the Capacity Management processes could be measured analysing the reliability of the demand predictions and the capacity reached. A confident index could be proposed to give an indication of effectiveness.

COTTON improvements brought to DAC and FCA solutions in particular, and Capacity Management in general, will end up in an increase of Capacity thanks to the better capacity estimation (and as a consequence an increase in the number of movements per airspace volume per unit time that can be managed thanks to COTTON Operational Improvements).

Flexibility and Environmental Key Performance Areas will also be increased, as the proposed sectorisations will be more precise thus requiring less tactical trajectory intervention in the DCB process. The indicators that can be used to estimate these improvements are shown in Figure 2.

Cost-Efficiency will be improved for the same reason; a reduction of the trajectory changes may decrease the average *delay in the operations*.

Increase ATCo Productivity

A better use and understanding of the complexity and workload assessment in a trajectory-based operations environment will allow better assignment of capacity to ATCo (especially relevant in a FCA environment but also in DAC) achieving a better balance of ATCo workload. The introduction and use of uncertainty information in the complexity models will provide a more reliable estimation of the number of ATCos needed to service certain airspace. In addition, the introduction of human factors will allow keeping the ATCo workload at an optimal level maximizing their productivity.

The improvement in ATCo productivity will be translated in more cost-efficient Capacity Management processes with improved human performance. Improvements in Cost-Efficiency could be evaluated in COTTON validations by estimating the expected *increase in the number of flights per ATCo-hour.* The improvements in **Human Performance** will be evaluated in COTTON planned real-time simulations by assessing *situational awareness* and *trust in automation* with the implementation of the improved complexity and workload metrics.

Improve the use of Trajectories Prediction

Uncertainty information is useful to analyze and quantify uncertainty in the complexity and workload metrics as well as to identify the current limitations to support the advanced Capacity Management processes that are being developed in S2020 program, in particular the needs of complexity and workload assessment to support DAC and FCA solutions.

COTTON will improve the capacity adjustment evaluating the complexity per trajectory. The research on how to provide this complexity per trajectory instead of traffic volumes will allow improving the Cost-Efficiency of the Capacity Management processes.

The Cost-Efficiency improvements in the use of uncertainty could be measured through the evaluation of the number of trajectories assigned to each ATCo (*Number of flights per ATCo hour*). The use of uncertainty will also have a positive effect on Human Performance. On one hand the reduction of unpredicted imbalances will increase ATCo *trust in automation*. On the other hand the more suitable complexity metrics and its reliability will improve ATCo *situational awareness.*

3. Target audience

COTTON Management Plan [1] identifies a list of groups of stakeholders that could have an interest or being impacted by COTTON outputs.

The goal of a Communication Plan is setting up a communication framework for the project. COTTON communication activities required to implement the dissemination and exploitation activities will follow the communication guidelines that will be further developed in COTTON Project Management Plan.

The Project Coordinator will take a proactive role in ensuring effective communications on the project and the SJU Communication Department will be consulted as required to ensure that communications are performed according to SJU guidelines.

COTTON communication activities shall ensure:

- Optimizing the information flow among the project members and organizing an efficient communication between involved actors;
- Broadcasting the project to the affected actors and main stakeholders;
- Communicating the project results to the interested policy body.

COTTON Members will have different communications requirements and responsibilities according to their role and responsibilities:

Actors	Communication Requirements
General Assembly	- COTTON Progress towards expected results; - Project general status (foreseen or actual delays, resources usage, budget consumption, risks, administrative or legal issues, etc.); - Content and timing of press releases and joint publications.
Project Coordinator and Project Management Support Team (PMST)	- WP status (tasks, deliverable, risks…) - WP dependencies
WP Leaders	- Content and timing of press releases and joint publications; - Tasks status; - WP dependencies.
Project Members	- Tasks status; - Meetings

Table 4: COTTON Communication requirements to internal actors

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The users will be informed of the generated results by different communications channels consequently to their needs. These channels present different tools to be used to adapt to the communication needs that each stakeholder requires. The selected channels are presented in the table below:

Actors	H2020 Participants Portal	Meetings and teleconferences	Email	Workshops	Website	Scientific Journals and articles	Leaflets, posters, press releases	Conferences and presentations
SJU Project Officer	X	X	X	X				
ANSPs			X	X	X		X	X
EASA					X		X	X
EU Commission					X		X	X
R&D Centres					X	X	X	X
Industry					X	X	X	X
Universities					X	X	X	X
S2020 Projects			X	X	X	X	X	X
Other DCB Exploratory				X	X	X	X	X
Project Members (all)	X	X	X		X			

Table 5: COTTON Communication Channels for the Different Users

4. Dissemination and Exploitation activities

4.1. COTTON Dissemination Needs

The dissemination goals of COTTON will change with the project progress. At the beginning of the project, dissemination will be more oriented to catch the target stakeholders' interest and get their feedback to ensure that COTTON activities are built in the right direction. Then, dissemination priority will be gradually moved towards broadcasting results to ensure their further exploitation. Following figure shows the dissemination and exploitation strategy during the project.
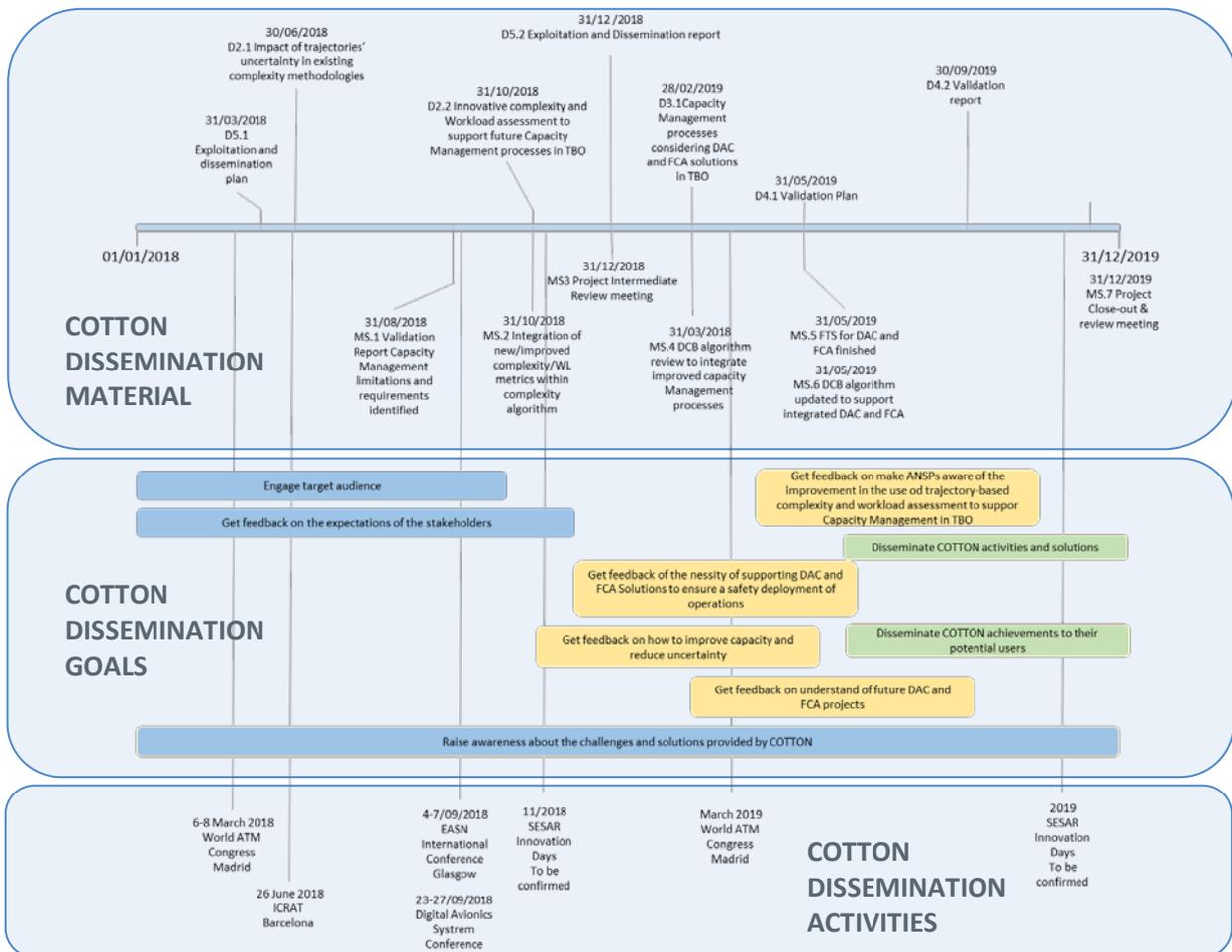

Figure 3: COTTON Dissemination Needs

4.2. Communication Matrix

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The communications requirements of each dissemination activity are documented in the Communications Matrix of the communication Plan. Below, an extract from the Communications Matrix is presented.

Communication Type	Objective of Communication	Medium	Audience	Responsible	Deliverable	Format
Workshops	Disseminate Project results and obtain stakeholders feedback	• Face to Face	• Project Coordinator • WP Leader • WP Team • Stakeholders	WP5 Leader / WP2 leader	• Agenda • Meeting Minutes • Session results	• Word files archived on project SharePoint site
COTTON news, disseminate project results	Announce Project results or events to promote project visibility	• Website • Professional Network • Conferences	• Project Team • Stakeholders	WP5 Leader	• Web announcement	• Web announcement
Announce Workshop	Increase project visibility	• Website • Professional Network	• Project Team • R&D Community • Stakeholders	Project Coordinator	• Web announcement	• Web announcement
Workshop invitation	Involve COTTON stakeholders	• Email	• Stakeholders	Project Coordinator	• Invitation Brochure • Workshop Agenda • Email	• Invitation Brochure • Workshop Agenda • Email
Publications (Scientific Journals, posters…)	Promote COTTON results	• Journals • Conferences	• R&D Community • Stakeholders	All Project Member	• Article • Paper • Poster • …	• Article • Paper • Poster • …

Table 6: COTTON Communication Matrix

4.3. COTTON Dissemination Activities

This section details the dissemination activities planned for COTTON, included the purpose, means, key messages, timing and responsible role for each activity. COTTON planned dissemination activities are the following:

- **Website**
  The website will be will be set up at the beginning of the project (T0+4) to disseminate relevant information. During the execution of the project, the website will be continuously updated to provide information about the latest developments and results of the project to keep everyone in contact with updated information. The information of the website will include also an updated schedule of events (such as conferences, workshops…).

- **Workshops**
  Workshops are a way to let in new ideas and ensure that stakeholders' needs are being addressed. They will embrace objectives such as open debates to gain experience, establish new ideas, and catch the attention and interest, and host gatherings for partners to take an active part in various parts of the project and understand and revise concept terms.

  COTTON consortium will organise two workshops with different objectives:

- **1st Workshop**: this workshop will be organised at the end of Steps 1 and 2 (see section 1.3.5). It will be used to validate the requirements proposed by COTTON related to DAC and FCA solutions. Also, the assurance of coherence and no overlapping with other tasks in SESAR Programme will be evaluated as a mean to facilitate further exploitation of COTTON Operational Improvements;

- **2nd Workshop**: a second workshop will be organised at the end of the project. It will aim to present the final results and assess its alignment with the initial objectives. A great diffusion of the results is also expected at the end of the project as well as to help spread new findings.

Workshops	
1st Workshop	- At the end of steps 1 and 2. - It will be used to validate the requirements proposed by COTTON related to DAC and FCA solutions. - Also the assurance of coherence and no overlapping with other tasks in SESAR Programme.
2nd Workshop	- At the end of the project. - It will aim to present the results and assess its alignment with the initial objectives.

Table 7: COTTON Workshops

- **Conferences and publications**

  COTTON partners will participate in conferences and seminars to raise awareness and gain stakeholder's interest. Publications will also be used as a mechanism of dissemination to serve the same purpose as conferences.

  To reach the SJU/ATM community, the partners have identified the following conferences that could be relevant to disseminate the results of the project:

  - The SESAR Innovation Days 2018, 2019;

  - The International Conference on Research in Air Transportation 2018;

  - The USA/Europe ATM R&D Seminar in 2019;

  - World ATM Congress 2018 and 2019;

  - The EASN International Conference on "Innovation in European Aeronautics Research" in 2018 and 2019.

  Other conferences to present the methodological approach developed by COTTON to the scientific community could be among others:

  - CEAS Air and Space Congress;

  - INFORMS Conference 2018 and 2019;

  - TRISTAN 2019;

  - Digital Avionics Systems Conference 2018 and 2019;

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- Transportation Research Board 2018, 2019;
- ICAS - International council of the aeronautical sciences, 2019;
- *Journée Portes Ouvertes* open days yearly held at ENAC.

Publications are a mechanism of dissemination that can be used in an external way to keep archives of the projects process, help spread changes or new developments between partners, and to give a more tangible feel to news and projects results. The following journals and magazines are identified related to publication of scientific articles and communications:

- Transportation Science;
- Transportation Research;
- Journal of Air Transport Management;
- Journal of Air Transportation.

Following tables describes in details the objectives, responsible partners and planned dates for each dissemination activity.

COTTON Project Results Workshops	
Purpose	Promoting the use of the project outputs and results
	Raise awareness about the challenges and solutions provided by COTTON
	Disseminate and Obtain acceptance of the COTTON proposed methodology
Responsible	WP5 Leader
Key message	COTTON 1st workshop:
	- Validate the requirements proposed by COTTON related to DAC and FCA
	- Assurance of coherence and no overlapping with other tasks in SESAR Programme will be evaluated
	COTTON 2nd workshop:
	- Present the final results
	- Diffusion of the results
Dates	-
Dissemination channels and tools	Target Groups shall be reached directly by contacting companies with experience in the required fields of expertise or by means of emails, Professional Network and website announcements.
Target Group	All COTTON Stakeholder Groups
Success criteria	COTTON results have been properly presented to the audience
	Stakeholder's feedback on the results is collected.
Others comments	The results of this workshop will be included as part of D5.1 Final Project Results Report.

Table 8: COTTON Project Results Workshop Description

Participation and presentation at scientific conferences	
Purpose	Raise awareness about the challenges and solutions provided by COTTON Get feedback on the expectations and experiences of the Stakeholders
Responsible	All
Key message	COTTON will propose solutions to maximize the effectiveness of the Capacity Management processes in TBO by: - Improve the use of trajectory-based complexity assessment to support Capacity Management including uncertainty - Promote the benefits of TBO to develop innovative demand/capacity models based on DAC and FCA solutions - Explore DAC and FCA solutions integration

Date	- World ATM Congress - http://www.worldatmcongress.org/
	  • Madrid, 6-8 March 2018
	- SESAR Innovation Days http://www.sesarinnovationdays.eu/
	  • 2018, To be confirmed
	- International Conference on Research in Air Transportation http://www.icrat.org/icrat/
	  • Barcelona, June 26, 2018
	- The USA/Europe ATM R&D Seminar in 2019 http://www.atmseminarus.org/
	  • To be confirmed
	- The EASN International Conference on "Innovation in European Aeronautics Research". https://easnconference.eu/i/
	  • Glasgow,4-7 September 2018
	- Journée Portes Ouvertes open days yearly held at ENAC . http://www.enac.fr/
	  • To be confirmed
	- CEAS Air and Space Congress –The Council of European Aerospace Societies – https://ceas.org/
	  • To be confirmed
	- Digital Avionics Systems Conference. http://www.dasconline.org/
	  • 23-27 September 2018
	- World ATM Congress - http://www.worldatmcongress.org/
	  • Madrid 1st quarter of 2019 (to be confirmed)
	- SESAR Innovation Days http://www.sesarinnovationdays.eu/
	  • 2019, to be confirmed
	- ICAS - International council of the aeronautical sciences
	  • 2019, to be confirmed

Dissemination channels and tools	Conference attendance, posters, presentations.
Target Group	R&D Community, Universities
Success criteria	Represent and disseminate main COTTON results
Others comments	N/A

Table 9: COTTON Conferences Participation Description

Publications	

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Purpose	Raise awareness and gains stakeholder's interest
Responsible	All
Key message	Depending on the publication it might focus in one of the following topics: - Improve the use of trajectory-based complexity assessment to support Capacity Management including uncertainty - Promote the benefits of TBO to develop innovative demand/capacity models based on DAC and FCA solutions - Explore DAC and FCA solutions integration
Date	From January 2018 to December 2019
Dissemination channels and tools	Articles, Publications, Papers, press releases. - **Transportation Research,** https://www.sciencedirect.com/journal/transportation-research - **Transportation Science,** https://www.informs.org/Publications/ - **Journal of ATM,** http://www.journals.elsevier.com/journal-of-air-transport-management - **Journal of Advanced Transportation,** http://onlinelibrary.wiley.com/journal/10.1002/(ISSN)2042-3195/
Target Group	R&D Community, Universities
Success criteria	Achieve at least the acceptance of one COTTON publication in a scientific journal or conference.
Others comments	According to the Grant Agreement: *A beneficiary that intends to disseminate its results must give advance notice to the other beneficiaries of — unless agreed otherwise — at least 45 days, together with sufficient information on the results it will disseminate.* *Each beneficiary must ensure open access (free of charge online access for any user) to all peer-reviewed scientific publications relating to its results (see Article 29.2 of the Grant Agreement [2]).*

Table 10: COTTON Publications Description

COTTON website	
Purpose	COTTON web will serve to communicate project achievements and announce workshops and latest news to the R&D community. Additionally, it will have SharePoint platform with access restricted to project members.
Key message	COTTON will propose solutions to maximize the effectiveness of the Capacity Management processes in TBO by: - Improve the use of trajectory-based complexity assessment to support Capacity Management including uncertainty - Promote the benefits of TBO to develop innovative demand/capacity models based on DAC and FCA solutions - Explore DAC and FCA solutions integration
Responsible	WP5 Leader is responsible to maintain COTTON website up to date and publish COTTON main achievements. All members will use it to upload working documents and share documentation. Access to the website will be controlled with a username and password.

COTTON website	
Date	From April 2018 until the end of the project
Dissemination channels and tools	Website
Target Group	Project Members, R&D Centres, Universities, SESAR Community.
Success criteria	COTTON website is kept up-to-date as the main information mean to share public documentation with the R&D community and working documents with COTTON members.
Others comments	N/A

Table 11: COTTON Website Description

4.4. Partners' Roles in Dissemination

Dissemination activities will be separated in two main groups according to their means of address:

- Internal dissemination between COTTON partners. Dissemination of evaluation reports and final project reports are included. COTTON partners should be informed of every change or update taking place in the project;

- External dissemination with stakeholders and possible beneficiaries from the projects outcome. Interested parties in the project should be informed of the projects progress and possible changes or updates. Communication will work both ways.

Each consortium member will be assigned specific roles and responsibilities to be carried out following scheduled goals as planned:

Partner	Internal dissemination	External dissemination
CRIDA	Dissemination of COTTON solution among the key ENAIRE's internal actors as a mean to address the envisioned ANSP's challenges dealing with DCB.	Dissemination in ANSP's R&D forums as ENAIRE representative.
DLR	Dissemination of COTTON solution findings (from validation activities)	Dissemination of results through scientific publications and conferences.
EUROCONTROL	Dissemination of COTTON main findings among ECTRL key actors: Network Research Unit, potential end-users as MUAC (future ATC capacity optimization solution), NM (Network Operations Planning).	As PJ08 and PJ09 leader, ECTRL will disseminate COTTON findings in SESAR industrial research projects involving all the projects partners in the preparation of wave 2 activities.
ENAC	Exchange of information about current complexity assessment limitations in the search for new improved methods adapted to SESAR 2020 Advanced Airspace Management.	Dissemination of results through scientific publications and conferences and through Journée Portes Ouvertes, open days yearly held at ENAC that promotes research to a wider

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Partner	Internal dissemination	External dissemination
		audience (research community, industry, government people, students, regular people interested in research that are tax- founded - In 2016 it attracted more than 1000 visitors -.
UPM	Dissemination and knowledge transfer to the various branches of engineering studies inside UPM at master and PhD level. Dissemination at Summer schools and internal R&D UPM conferences. Dissemination inside the Aerospace Engineering School Network PEGASUS.	Dissemination of COTTON activities and solutions on forums related with the following topics and/or disciplines: uncertainty analysis in ATM, Bayesian application in ATM, Human factors in ATM, ATC training for future ATM applications…
TU DELFT	Exchange information (about methods and algorithms) and results of TUD's solution space approach.	Through conferences, inform other stakeholders (outside of aviation) about COTTON. TUD has a network of other transportation domains, which might benefit from COTTON's results, including the automotive domain (i.e., the development towards highly automated self-driving cars) and the maritime domain (vessel traffic management).

Table 12: Dissemination Roles

5. Evaluation of the effectiveness

5.1. Design of Success Criteria

In order to guarantee the accomplishment of the expected measures in dissemination activities, and to facilitate an efficient and transparent project management in general, quantitative objectives and expected results in dissemination will be included in the dissemination plan.

Indicator type	Indicator	Goal
Execution	Minimum number of conferences and seminars in which COTTON project will be presented	3
	Number of COTTON website updates per month	1
	Internet sites where COTTON is placed	2
	Key Stakeholders contacted to make COTTON results known	5
	Number of publications released	2
	Minimum of workshops organized by COTTON	2
Results	COTTON presence in ATM Publications	2
	Number of Key Stakeholders reached and interested in further exploitation	3
	Number of promotional links achieved to COTTON website	1
	Attendees to COTTON's sessions in seminars and conferences	50

Table 13: COTTON Dissemination Indicators

The indicators included in COTTON Dissemination and Exploitation Plan will serve as a starting point and as a valuable criterion in evaluations that will be conducted throughout the project.

Especially in the mid-term evaluation, the review of indicators and the assessment of the activities enable internal trouble detection and its timely correction so that an effective and efficient management and coordination are achieved.

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6. Exploitation Plan

6.1. Exploitation Strategy

The exploitation strategy to ensure that the results are used is described in the following roadmap.
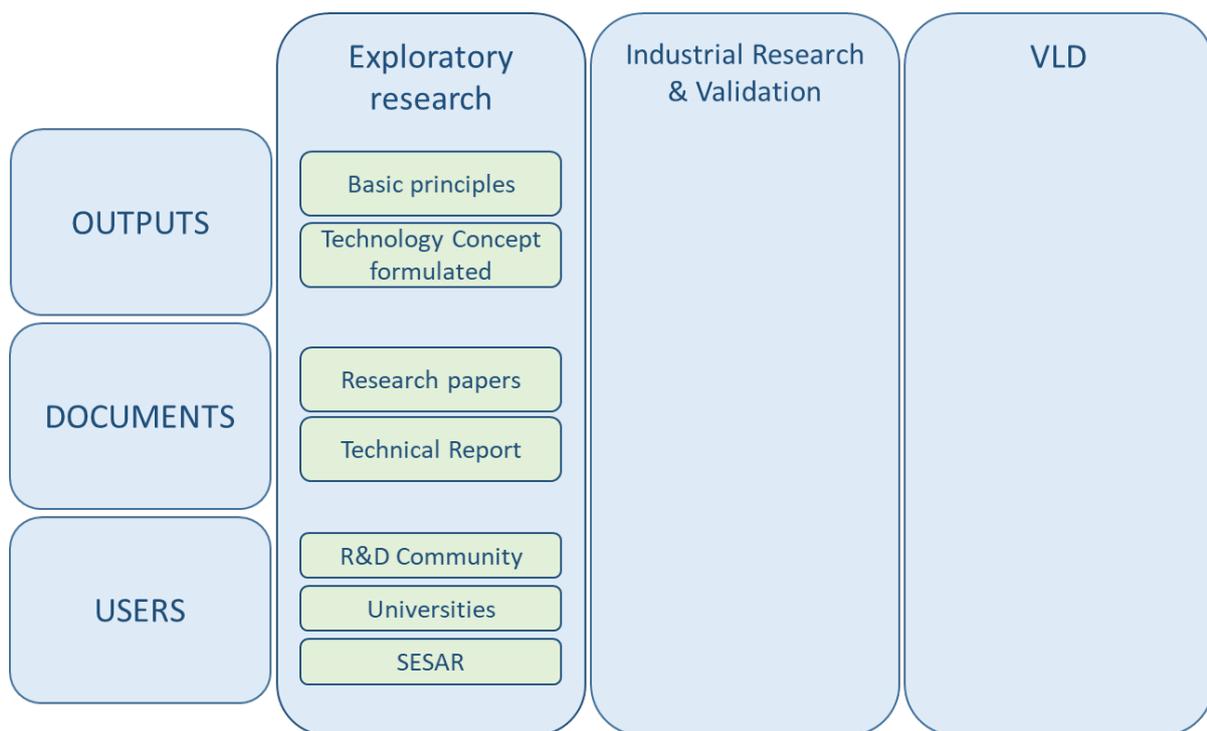

Table 14: Exploitation roadmap

6.2. Exploitation at Consortium Level

COTTON results will allow **UPM** to identify the limitations of the current complexity metrics and to acquire complexity metrics requirements to operate in TBO. These methodologies will have to deal with the trajectories' uncertainty, which will help UPM to comprehend how the FCA and DAC concern operational future. Moreover, this project will improve experimental human factors tests.

The outcomes from COTTON will provide **CRIDA** the capacity to integrate the explored complexity metrics for both DAC and FCA operational environment, especially in the SESAR Projects PJ09 and PJ10 about DCB and FCA respectively. Furthermore to consider these improved metrics for the future researches regarding airspace complexity computations for internal projects in CRIDA and ENAIRE. Moreover, the uncertainty associated to trajectory and traffic will be assessed under an environment with concepts of DAC and FCA integrated together, such as the validation exercises expected to be carried out by 2019.

ENAC will be able to review and improve the complexity metrics that they have previously developed in different projects, and expand their experience in the application of evaluation metrics for the characterization of scenarios.

The participation of **DLR** in the validation phases of the improvements that are identified in the different metrics, will contribute to improve the experience in the application of the concepts of DAC and FCA in different operational situations

Given the wide participation of **EUROCONTROL** in different SESAR projects, the developments and conclusions obtained in COTTON can contribute to the improvement of the proposals in other SESAR solutions

The participation of **DELFT** in this project will allow them to verify the applicability of their metrics proposals in the DAC and FCA concepts, and will contribute to broadening their experience in the application of future operational concepts.

6.3. Exploitation at Stakeholders Level

The identification of the **improvements of the current complexity and workload metrics** will provide a method to deal with the innovative aspects of SESAR 2020 solutions related to the future airspace management.

SESAR Validation infrastructure will prove the innovative trajectory-based approaches to support the future Capacity Management processes considering DAC and FCA solutions.

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7. References

[1]   783222_COTTON_D1.1_Project Management Plan.

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