

CONVERGE - Telecommunications and Computer Vision
Convergence Tools for Research Infrastructures

D4.1: Plan for Dissemination Exploitation, Communication and Training

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CHANGE REGISTER

Version	Date	Editor	Organization	Changes
A	06/07/2023	Dirk Slock and Filipe B. Teixeira	EURECOM / INESC TEC	Initial draft
B	13/07/2023	Sérgio Silva	Adapttech	Added section on exploitation
C	14/07/2023	Filipe B. Teixeira	INESC TEC	Added section on communication
D	20/07/2023	Serge Fdida and Emilie Mespoules	SORBONNE	Added section on engagement with other RIs
E	24/07/2023	Luis Pessoa	INESC TEC	Added executive summary, introduction and conclusion. Expanded exploitation section.
F	25/07/2023	Ibrahim Hemadeh	INTERDIGITAL	Added section on standardisation
G	25/07/2023	Dirk Slock and Raymond Knopp	EURECOM	Added sections on training and dissemination
H	27/07/2023	Walid Dabbous	INRIA	Reviewed and made suggestions.
I	28/07/2023	Ana F. Sequeira	INESC TEC	Changed language to English U.K.

EXECUTIVE SUMMARY

This document presents the plans of the CONVERGE project for dissemination, communication, exploitation and training, including plans for achieving impact in standardisation bodies and plans for engagement with other research infrastructures and initiatives, starting by SLICES-RI but extending to other projects and initiatives worldwide.

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ABBREVIATIONS

3GPP	3rd Generation Partnership Project
5G	Fifth Generation mobile system standard
5G-ACIA	5G Alliance for Connected Industries and Automation
5GTN	5G Test Network
6G	Sixth Generation mobile system standard
AIOTI	Alliance for the Internet of Things Innovation
EMC	Electromagnetic Compatibility
ERM	Electromagnetic Compatibility and Radio Spectrum Matters
ETSI	European Telecommunications Standards Institute
ESFRI	European Strategy Forum on Research Infrastructures
IC	Integrated Circuit
IPR	Intellectual Property Rights
ISG	Industry Specification Group
KPI	Key Performance Indicators
LIS	Large Intelligent Surface
O-RAN	Open Radio Access Network
OAI	OpenAirInterface
PCB	Printed Circuit Board
RAN	Radio Access Network
RFIC	Radio-Frequency Integrated Circuit
RI	Research Infrastructure
RIS	Reconfigurable Intelligent Surface
SDO	Standards Development Organisation
SLICES-RI	Scientific Large-scale Infrastructure for Computing/Communication Experimental Studies – Research Infrastructure

1. INTRODUCTION

The main objective of the CONVERGE project is the development of an innovative toolset combining radio and vision-based communications and sensing technologies to enable an emerging area of research aligned with the motto “view-to-communicate and communicate-to-view”, and through the integration of this toolset, advance the state of the art of a set of Research Infrastructures (RIs) to the greatest extent aligned with the ESFRI SLICES-RI (Scientific Large-scale Infrastructure for Computing/Communication Experimental Studies – Research Infrastructure). This new area of research departs from the traditional and isolated research in each of the fields and aims at creating new knowledge and discoveries at the intersection of wireless communications, computer vision, sensing, and machine learning. This toolset is expected to be deployed into 7 RIs involved in the project, while aligned with the ESFRI SLICES-RI access modes and policies, with the ultimate goal of improving their competitiveness. The toolset and associated RIs will be used by the researchers and industry to study several scenarios in different market verticals of relevance for Europe including telecommunications, automotive, health, manufacturing and media as described in detail in CONVERGE Deliverable 1.1 - Requirements and use cases.

Given the infrastructure development nature of this project, outreach activities are particularly important in order to reach target groups such as researchers and companies that can potentially become users of the CONVERGE RI, but also other important stakeholders as well as the general public.

This document presents the plans of the CONVERGE project for dissemination, communication, exploitation, standardisation, training and engagement with other RIs, including the following sub-sections:

- Dissemination activities: scientific publications in conferences, workshops and journals, white papers, organisation of events such as conferences, workshops, special sessions, tutorials, exhibition booths, public demos, among others.
- Communication activities: media kit, presentation slides template, deliverables template, website, social media, newsletters, posters and leaflets, promotional videos, press-releases and interviews.
- Exploitation: plans of the consortium as well as from each partner for maximizing the impact of the project results, with a more academic/research focus for R&D partners, and a focus on commercial exploitation routes for the companies involved.
- Standardisation: plans for achieving an impact in standardization for a such as 3GPP, IEEE, and ETSI, resulting from the participants’ activity in various standards groups, and simultaneously monitor ongoing standardisation activities for keeping the project aligned with the relevant developments in standards.
- Training: plans for training activities of students and staff of the involved RIs will be addressed to ensure a long-lasting use of the toolset beyond the timeframe of the project and maximise its impact.
- Engagement with other RIs: plans for engagement with other research infrastructures and initiatives, starting by SLICES-RI but extending to other projects and initiatives worldwide.

While this document presents the project’s plan along the different dissemination, communication, exploitation, standardisation, training and engagement with other RIs vectors, the actual developed activities throughout the project will be described in a yearly report along with an assessment of the impact achieved with respect to dissemination and communication KPIs.

2. DISSEMINATION

2.1 Target audience

As a first step in presenting that plan, the intended dissemination groups of audiences are identified. This characterization is helpful for defining appropriate activities that are designed to successfully reach and attract the interests of each particular group.

- As a research infrastructures project, one of the main categories of target audience is the wider academic community. This includes individual researchers, research centres and institutions, and universities from around the globe. The broader fields of research relevant to CONVERGE include signal processing, comprising both communications-oriented signal and image processing, communications engineering, electromagnetics and wave propagation, wireless communications, integrated and printed circuit and hardware design, networking, antennas and metamaterials, as well as machine learning.
- Industrial entities are a core target of the project's dissemination outputs. Research-oriented enterprises, SMEs, manufacturing companies, network operators, software companies, and large industrials of the information and technology sector present key opportunities for industrial exploitation and widespread adoption of the foreseen technological advancements.
- Since the project aims to have a recognisable impact on various standardisation actions, European (as well as global) standardisation and pre-standardisation bodies are of special interest. Examples of such bodies are ETSI, 3GPP, and IEEE (see standardization section).
- Wider partnerships and collaborations with similar research areas such as the 5G PPP, SNS-JU/H2020, KDT or other projects and consortia. Establishing communication channels with such entities is of particular interest due to expected synergies and collaborations.
- The outputs of the project are also relevant to the European Commission (both as a funding and operational agency) and legislative bodies (national or international). 6G systems and networks, and their key enablers such as Reconfigurable Intelligent Surfaces (RIS) or multimodal sensing integrating radio and vision, constitute some of the most highly anticipated technologies of the transition to beyond-5G infrastructure, and will inevitably be subject to societal, political, legislative, and economic policies. Bringing high-level technical knowledge to such bodies is therefore important for the longevity of the results produced by this project.
- The general public at large will be informed, for example through open days at the universities.

2.2 Internal recording and reporting

To facilitate seamless record-keeping, a dedicated Excel file has been established in the project repository, allowing for any partner to introduce new entries related with dissemination and communication actions. In order to facilitate the organization of information, the following sections have been created in this file: 1) events, 2) papers and public documents, 3) news and social media posts, and 4) press-releases. All actions will be communicated through the WP4 e-mailing list and registered in the dedicated Excel file, accompanied by the uploading of the relevant material (e.g., presentation slides, manuscripts) to be stored in the appropriate WP4 sub-folders.

2.3 Dissemination Activities

2.3.1 Research, academic and educational community (publications)

The academic results of the project will be communicated, apart from the deliverables, via (primarily) academic publications, data sets, technical data sheets, etc. Therefore, academic publishing constitutes one of the main pillars of dissemination items. The publications and relevant material will be Open Access, either in Green or Gold form (see Data Management Plan). To enhance their potential outreach, each publication will be followed by an accompanying announcement by the project's social media

accounts and the list of all publications will be visible on the website, with their respective access links. Conference publications will be further accompanied by a presentation and/or poster at their respective venues, as is standard practice by the organisers. Video material of selected presentations will be uploaded to the project's YouTube account – if permitted by the respective licenses. Simultaneously to the focus on highly technical publications, the Consortium will additionally orchestrate collaborations to prepare magazine articles, intended to communicate the project's vision, goals, advancements, and insights to the general public. Such publications are expected to arise, for example, from the contents of deliverables, prototypes, measurements, and Proof-of-Concept campaigns.

2.3.2 Target Conferences and Workshops

Preliminary, intermediate, and final project results will be continuously published through articles and exhibition booths at various international and national known conferences and workshops. Considering the huge number of such conferences, the coordinator and the WP4 leader will keep a critical eye on the quality of them while achieving a qualified selection of appropriate conferences to participate in.

1. **High profile conferences in signal processing, communications and networking domains** will be primarily targeted:
 - IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)
 - IEEE International Workshop on Signal Processing Advances in Wireless Communications (SPAWC)
 - IEEE International Conference on Communications (ICC)
 - IEEE Global Communications Conference (GLOBECOM)
 - IEEE International Conference on Computer Communications (INFOCOM)
 - IEEE European Microwave Week (EuMW)
 - IEEE EMC+SIPI and EMC Europe Symposium
 - IEEE Antennas and Propagation Symposium (APS)
 - IEEE International Microwave Symposium (IMS)
 - IEEE International Conference on Image Processing (ICIP)
 - IEEE 5G World Forum
 - IEEE / CVF Computer Vision and Pattern Recognition Conference (CVPR)
 - IEEE Conference on Virtual Reality
 - International Conference on Computer Vision (ICCV)
 - International Conference on 3D Vision (3DVconf)
 - International Symposium on Antennas and Propagation (ISAP)
 - URSI: General Assembly (GASS), EMTS and Atlantic Radio Science Meetings
 - 6G Wireless Summit
 - Wireless Global Congress hosted by Wireless Broadband Alliance
 - Mobile World Congress
 - TCCA Critical Communications World
 - International Joint Conference on Artificial Intelligence (IJCAI)

2. **Conferences focused on the European community:**
 - European Conference on Networks and Communications & 6G Summit (EuCNC & 6G Summit)
 - European Wireless Conference (EW)
 - European Signal Processing Conference (EUSIPCO)
 - European Conference on Antennas and Propagation (EuCAP)
 - European Microwave Week (EUMW)
 - European Conference on Computer Vision (ECCV)

- IEEE 5G World Forum
 - Wireless Global Congress, hosted by Wireless Broadband Alliance
 - Mobile World Congress
 - TCCA Critical Communications World
3. **High profile conferences in the wider scientific domains** that are relevant to the CONVERGE project:
- ACM Special Interest Group on Data Communication (SIGCOMM)
 - Conference on emerging Networking EXperiments and Technologies (CoNEXT)
 - IEEE Vehicular Technology Conference (VTC)
 - IEEE Wireless Communications and Networking Conference (WCNC)
 - IEEE International Symposium on Personal, Indoor and Mobile Radio Communications (PIMRC)

2.3.3 Target Journals

- IEEE Transactions on Vehicular Technology
- IEEE Transactions on Communications
- IEEE Transactions on Wireless Communications
- IEEE Transactions on Antennas and Propagation
- IEEE Transactions on Microwave Technologies and Techniques
- IEEE Transactions on Terahertz Science and Technology
- IEEE Transactions on Signal Processing
- IEEE Transactions on Machine Learning in Communications and Networking
- IEEE Transactions on Pattern analysis and Machine Intelligence
- IEEE Transactions on Multimedia
- IEEE Transactions on Signal and Information Processing over Networks
- IEEE Transactions on Computational Imaging
- IEEE Transactions on Big Data
- ACM Transactions on Knowledge Discovery from Data (TKDD)
- ACM Transactions on Multimedia Computing, Communications, and Applications (TOMM)
- IEEE Wireless Communications
- IEEE Journal of Selected Areas in Communications
- IEEE Journal of Selected Topics in Signal Processing
- IEEE Access
- IEEE Open Journal of the Communications Society
- IEEE Open Journal on Antennas and Propagation
- IEEE Open Journal of Signal Processing,
- IEEE Communications Surveys & Tutorials
- IEEE Wireless Communications Letters
- IEEE Antennas and Wireless Propagation Letters
- IEEE Microwave and Wireless Components Letters
- IEEE Communications Letters
- IEEE Communications Magazine
- IEEE Signal Processing Magazine
- IEEE Network Magazine
- IEEE Sensors Journal
- Proceedings of the IEEE

- Review of Electromagnetics
- Scientific Reports
- Intelligent and Converged Networks
- ITU Journal on Future and Evolving Technologies
- Journal of web semantics
- Elsevier Neural Computing and applications
- Journal of Machine Learning Research

2.3.4 Workshops/Webinars/Tutorials

The project will organize dedicated CONVERGE workshops or special/convened sessions, organized as part of wider high-profile academic events mainly during the 2nd and 3rd year of its lifetime. Additionally, tutorials and webinars will be given as part of the Partners' participation in conferences and other relevant events. Several of the partners have extensive experience with these activities. The main target venues for such activities are the high profile conferences in signal processing, communications and networking, such as ICASSP, GLOBECOM and ICC, but other possibilities will also be considered.

2.3.5 Contributions to industry and research associations

The consortium will ensure that its results will be frequently communicated to various fora (industrial, academic, legislative, standardisation) and other relevant technical and non-technical bodies. Those contributions will focus on activities in the field of beyond 5G and 6G network declarations and definitions, such as, 6GIA, Wireless World Research Forum (WWRF), One 6G Association, Next Generation Mobile Networks (NGMN), RIS TECH Alliance (RISTA), NATO Communications and Information Agency (NCIA), AIOTI etc. These dissemination activities will be done through the partners, who are members in one or several of these organisations (INESC TEC, INTERDIGITAL, EURECOM, among others).

To that end, CONVERGE aims at capitalising its training and standardisation efforts (see sections below) to extend its dissemination output.

2.3.6 Organisation of a Scientific Challenge

The organisation of a Scientific Challenge inspired in the “ITU AI/Machine Learning in 5G” (see <https://www.itu.int/en/ITU-T/AI/challenge/2020/Pages/default.aspx>) will also be in the scope of this WP4. Also, the IEEE ICASSP conference has been organizing grand challenges for a few years at this annual flagship conference (see e.g., for ICASSP 2024: <https://2024.ieeeicassp.org/call-for-sp-grand-challenges/>). Such a Grand Challenge involves constituting a database of measurements made on the CONVERGE research infrastructure and making it available to the challenge participants. The challenge then will be to apply signal processing and machine learning techniques to these data in order to optimize an objective that needs to be defined. The presentation of the preselected challenge contributions and the selection and announcement of the final winner(s) is then typically organized in a special session or workshop at the flagship conference.

2.4 Dissemination KPIs

The continuous monitoring of CONVERGE dissemination activities will allow us to periodically evaluate the progress towards the achievement of the established Key Performance Indicators (KPIs). These KPIs are presented in Table 1.

Table 1 – Dissemination KPIs

Dissemination action	Expected KPI at the end of the project
Publications in target conferences and workshops	20
Publications in target journals and magazines	6
Organisation of Workshops and Special/convened sessions	6
Delivery of tutorials and webinars	3
Organisation of discussion panels	3
Contributions to industry and research associations	6
Organisation of Scientific Challenge	1

3. COMMUNICATION

In this section, the identified activities in terms of dissemination and communications are outlined, along with the necessary coordination actions and provisions to ensure the long-term dissemination of the project, after the end of its duration.

3.1 Media Kit

The media kit within the dissemination package plays a vital role in conveying the project's message and creating a cohesive brand image. It consists of a collection of graphical materials and templates carefully designed to capture the essence of the CONVERGE project and effectively communicate its objectives, outcomes, and key messages to various stakeholders.

The media kit includes professionally designed project logos, visual elements, and colour schemes that reflect the project's identity and branding guidelines. These assets ensure consistency in visual representation across all project materials, such as presentations, reports, brochures, and social media graphics. By using these templates, project partners and stakeholders can easily create visually appealing and consistent content that aligns with the project's overall image.

Moreover, the media kit provides guidelines and instructions on how to use the graphical materials effectively. It includes recommendations on font usage, image placement, and overall design principles, ensuring that all communication materials maintain a coherent and professional look and feel.

By providing a media kit as part of the dissemination package, CONVERGE empowers project partners, stakeholders, and even external entities to effectively disseminate project information. This consistency in branding and visual representation not only enhances the project's awareness but also facilitates recognition and association with the project's objectives and achievements.

The media kit is conveniently accessible through the project's website, allowing easy downloading of graphical materials, templates, and guidelines by all those involved in the dissemination process.

3.1.1 Logo

The CONVERGE logo aims to integrate on the same image two key elements that represent the project motto “view-to-communicate and communicate-to-view”. The vision element is represented by the camera lens (integrated with the “O”), and the communications element by an antenna array (integrated with the final “E”). Below, different versions of the logo are presented in colour, black and negative.



Figure 1 – Colour version of the CONVERGE logo.



Figure 2 – Black and white version of the CONVERGE logo.



Figure 3 – CONVERGE logo under blue background.



Figure 4 – CONVERGE logo under black background.

3.1.2 Colour Palette

The main colour of the CONVERGE logo is #07074e. A colour-blind friendly palette can be found in Figure 5.

Vibrant palette

#001923	#001444	#07074E	#23084B	#37073C
White Text Contrast 18.05:1	White Text Contrast 17.74:1	White Text Contrast 18.27:1	White Text Contrast 17.39:1	White Text Contrast 16.69:1

Monochromatic palette

#A4A4B4	#6E6E86	#07074E	#0E063D	#10042D
Black Text Contrast 8.55:1	White Text Contrast 4.96:1	White Text Contrast 18.27:1	White Text Contrast 18.88:1	White Text Contrast 19.49:1

Contrasting palette 1

#332C07	#505000	#6E6E86	#07074E	#10042D
White Text Contrast 13.96:1	White Text Contrast 8.44:1	White Text Contrast 4.96:1	White Text Contrast 18.27:1	White Text Contrast 19.49:1

Contrasting palette 2

#031609	#042311	#07074E	#53170C	#370F07
White Text Contrast 18.71:1	White Text Contrast 16.75:1	White Text Contrast 18.27:1	White Text Contrast 14.04:1	White Text Contrast 17.02:1

Figure 5 – CONVERGE colour palette.

3.1.3 Font Family

The logo features the Roc Grotesk Sans Serif Font. It is a user-friendly and contemporary typeface. It falls under the grotesque sans serif category, designed with minimal contrast in its details, making it ideal for displaying small blocks of text.

Deliverables are based on Calibri font for body text Arial for the headings, which should be written in bold, 14pt. Subheadings should be written in Times New Roman, bold, 13pt.

3.2 Presentation Slides Template

To establish a harmonised view of the CONVERGE project, a template for presentation slides has been defined. It is based on Microsoft PowerPoint and can be applied to internal discussions or external presentations. An improved version can be proposed throughout the project to meet specific needs.

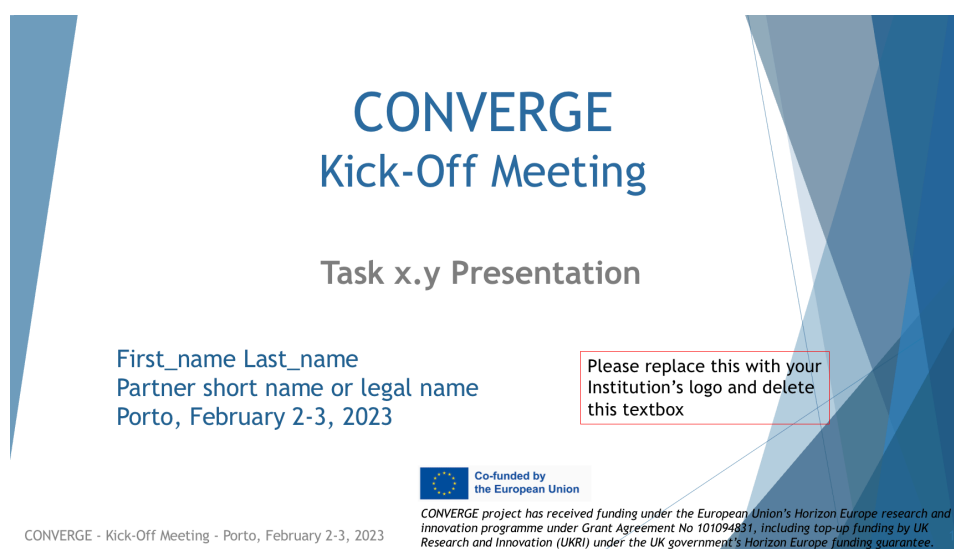


Figure 6 – Presentation Slides Template.

3.3 Deliverable and meeting minutes template

The same process was established for the template for deliverables, which is based on Microsoft Word and can be applied to internal or external documents. Also, providing a template for meeting minutes helps harmonising the communication process among project partners and external entities. The template can be seen in Figure 7. An improved version can be proposed throughout the project to meet specific needs.



CONVERGE - Telecommunications and Computer Vision
Convergence Tools for Research Infrastructures

Dx.x: Title

Work package	WPx	Task	Task x.x
Due date	dd/mm/yyyy	Submission date	dd/mm/yyyy
Leader in charge of deliverable	Leader		
Scientific coordinator:	Manuel Ricardo (INESC TEC)		
Project coordinator:	Luis Pessoa (INESC TEC)		
List of contributors	INSTITUTO DE ENGENHARIA DE SISTEMAS E COMPUTADORES, TECNOLOGIA E CIENCIA UNIVERSITY OF OULU BARCELONA SUPERCOMPUTING CENTER-CENTRO NACIONAL DE SUPERCOMPUTACION EURECOM SORBONNE UNIVERSITE INSTITUT NATIONAL DE RECHERCHE EN INFORMATIQUE ET AUTOMATIQUE CSC - IT CENTER FOR SCIENCE LTD THE QUEEN'S UNIVERSITY OF BELFAST ALLBESMART LDA ADTECHNOLOGIES SA INTERDIGITAL EUROPE LTD FINWE OY FINCLOUD OY		
Dissemination Level	PUSEN <small>PU: Public, fully open, e.g., web (Deliverables flagged as public will be automatically published in CORDIS project's page) SEN: Sensitive, limited under the conditions of the Grant Agreement</small>		

CONVERGE 101094831



Grant agreement no: 101094831

Telecommunications and Computer Vision Convergence Tools
for Research Infrastructures

CONVERGE

Meeting Minutes

Subject	
Location/meeting link	
Date	
Chair	
Participants	INESC TEC UOULU BSC CNS EURECOM SORBONNE INRIA CSC ALLBESMART LDA GREENERWAVE Adaptech Finwe Oy FinCloud Ltd. Rice University RUTGERS QUB INTERDIGITAL
Apologies	

Author	Partner	Document Title	Date	Version
		CONVERGE WPx meeting minutes		A

Figure 7 - Deliverable and meeting minutes template.

3.4 Project Acknowledgement text

A unified acknowledgement text has been agreed upon to be inserted into all Project’s outputs and results (such as publications, datasheets, etc.), as below:

This work was supported by the CONVERGE project which has received funding under the European Union’s Horizon Europe research and innovation programme under Grant Agreement No 101094831, including top-up funding by UK Research and Innovation (UKRI) under the UK government’s Horizon Europe funding guarantee.

Additional optional text:

Views and opinions expressed are however those of the authors only and do not necessarily reflect those of the European Union or UKRI. The European Union or UKRI cannot be held responsible for them.

3.5 Website (Initial Version)

A lightweight initial version of the project website was launched to provide essential information on the project, namely the logo, partners and funding. The website is hosted at INESC TEC and is available through <https://converge-project.eu>. Current contents are shown in Figure 5.

CONVERGE

view-to-communicate and communicate-to-view

Telecommunications and Computer Vision
 Convergence Tools for Research Infrastructures

Website under construction



Figure 8 – Preliminary version of the CONVERGE website.

3.6 Website (Final Version)

The CONVERGE website is a critical piece on the communication plan, as it provides comprehensive and up-to-date information to stakeholders and the public. The planned project website will feature a user-friendly interface, reflecting the project's branding and visual identity, ensuring a seamless experience for visitors.

It will contain essential sections such as:

- **About Us** - describes the project's objectives, work-packages, and consortium members.
- **News and Events** - provides regular updates on project progress, recent achievements, upcoming events, and activities, fostering engagement and promoting awareness.
- **Resources** - offers access to project-related publications, public deliverables, research papers, reports, and other valuable content, enriching the audience's knowledge and understanding of the project's field.
- **Contact Us** - facilitates easy communication for inquiries, collaboration opportunities, and feedback, ensuring stakeholders can interact with the project team effortlessly. The visitor can also subscribe to the CONVERGE newsletter.

Other sections might be added along the project execution. The website will be based on the open-source WordPress platform and hosted at INESC TEC premises.

3.7 Social Media

The presence of CONVERGE on the social media is essential for promotion and engagement among the different target groups. A comprehensive social media strategy will be employed to share regular project updates, success stories, upcoming events, and other relevant information and valuable resources. Visual content, including infographics, images, and videos, will be utilized to enhance engagement and convey key messages effectively. We aim to leverage various social media to reach the different CONVERGE target groups. A call for action should be thought for each publication to increase the engagement and other communication tools, such as the website.

Two social media platforms will be considered: LinkedIn and X (Twitter). These platforms were chosen since they are the main two platforms used by the CONVERGE target groups. Other platforms can be used during the project, if they could bring relevant benefits for the project. Social media analytics will be continuously monitored to assess the performance, optimize content, and fine tune communication strategies to ensure maximum reach and impact.

Publications will be scheduled so that they do not interfere with each other. Each social network might have different contents, taking advantage of the different functionalities and target groups. If multiple publications are prepared for the same period, they should be properly scheduled to avoid a decrease on the reach and interaction.

The publications on the social media can include:

- Important project milestones;
- Announcements regarding deliverables;
- Announcements on a published paper;
- Important consortium meetings;
- Public appearances in exhibitions, workshops and conferences;
- Press-releases and their outcome.

The CONVERGE LinkedIn page can be accessed at the following URL:

<https://www.linkedin.com/company/converge-project>

The CONVERGE Twitter page can be accessed at the following URL:

https://twitter.com/converge_eu

3.8 Newsletter

The newsletter is an important communication tool in the CONVERGE dissemination plan, providing the subscribers project updates, achievements, and milestones. It highlights impactful success stories, upcoming events or milestones, encouraging the scientific community engagement and the general public participation. The contents should have a call for action strategy, pointing the readers to the CONVERGE website, social media, or other strategic destination.

Regular evaluation of engagement and number of subscribers will be performed, making the newsletter an effective means of disseminating the project information and fostering a strong sense of community within the project consortium. The project will send the newsletter every six months to all subscribers. The first newsletter is planned to be sent on M6. Subscriptions to the project newsletter can be done manually or through the project website.

3.9 Posters, Leaflets, Roll-ups

The creation of CONVERGE posters, leaflets and roll-ups aims to create visually engaging and informative materials to promote the CONVERGE key messages, objectives, and research activities. Posters will be designed with eye-catching graphics and concise text to showcase the CONVERGE outcomes, targeting a wide audience in various settings such as conferences, workshops, and exhibitions. Additionally, leaflets will be produced to provide more detailed information about the project, namely the general overview of the project and its tools. These materials will be distributed both digitally and in print, maximizing reach and effectiveness in raising awareness and fostering active engagement with the project's target groups. The produced material should be graphically consistent and aligned with CONVERGE graphical guidelines.

3.10 Promotional video clips (YouTube)

Promotional video clips are important to promote, captivate and inform about the CONVERGE project. These short video clips will showcase the project's objectives, activities, and impact in a visually engaging manner. The videos will be strategically distributed across platforms such as YouTube and social media channels and a website to reach a wide and diverse audience. By utilizing storytelling, testimonials, and visuals, the video clips will effectively communicate the project's achievements, demonstrations of prototypes, proof-of-concept demonstrations, interviews, plenary meetings, or participation in public events. This fosters greater awareness, engagement, and support from stakeholders, partners, and the general public.

3.11 Press Releases and Interviews

The creation of Press Releases aims to proactively engage with media outlets and industry experts to amplify the CONVERGE visibility and impact. Press releases will be strategically composed and distributed to announce significant project milestones, events, and outcomes, targeting both national and international media. These releases will effectively convey the project's key messages, achievements, and contributions to society, fostering positive media coverage and public interest. Additionally, the plan will include conducting interviews with project leaders and experts to promote CONVERGE on specific events or important project milestones.

The Press Releases and Interviews can lead to the presence in press, blogs, newspapers, scientific magazines, podcasts, videocasts, panels, TV and radio broadcasts. The creation of press-releases should be synchronised with other communication tools.

3.12 Communication KPIs

The periodic monitoring of CONVERGE communication actions will allow us to evaluate if communication objectives are being achieved. To assess the impact, we define a set of KPIs that are presented on Table 2.

Table 2 – Communication KPIs

Communication channel	Responsible partner(s)	Activity Timing	Expected KPI at the end of the project
Website	INESC TEC (management) All partners (content contribution)	M3 to M36	~2000 unique visitors
Promotional video clips (YouTube)	All partners	M6 to M36	~200 views
Communication materials (brochures, flyers, posters)	INESC TEC and Allbesmart	M6 to M36	~1000 brochures/flyers/posters
Social Media channels	INESC TEC (management) All partners (content contribution)	M6 to M36	~200 unique followers ~3000 reach
Newsletters	EURECOM	M6 to M36	Every 6 months ~200 subscribers
Press-Releases	All partners	Continuously	5 press-releases
News appearances	All partners	Continuously	50 news, opinion articles or interviews

3.13 Overview of communications activities and target groups

Effective communication lies at the core of the consortium effort to disseminate crucial project information, engage stakeholders, and foster meaningful collaborations. This section presents an overview of the communication strategy devised for CONVERGE.

Table 2 shows a succinct summary of the planned communication activities, the communication channels and the corresponding target groups. This table serves as a valuable reference, showcasing the multifaceted approach we are employing to ensure the wide-reaching impact of CONVERGE.

Table 3 - Overview of communication activities and target groups

Type of information	Communication channels	Target Group(s)
General information about CONVERGE, its main goals and expected outcomes	CONVERGE website Promotional video clips (YouTube) School visits Science posters Open lectures/public events	General public Citizen organisations Students (colleges and schools) Research infrastructures users Companies

	EU MSCA Researchers’ Night Science/engineering festivals and exhibitions	Individual citizens
Recent news and important updates from the project. Publicity of the organized challenge.	Social media (Twitter and LinkedIn) Press releases TV/Radio broadcast Project website European technology platform events	Scientific community (general) Research infrastructures users Companies Industry platforms Research policy agencies and regulators General public
Educational/training material: - Wireless communications, sensing, vision, radio and ML - Benefits on the European economy - Impacts on everyday lives	Video interviews (YouTube) Website School visits Open lectures Scientific/engineering festivals Training material (YouTube)	Students (colleges and schools) Teachers (schools) General public

4. EXPLOITATION

The preliminary exploitation plans of the project are described in this section, associated with a dedicated task in WP4, Task 4.3. CONVERGE will follow an exploitation strategy that will take advantage of established practice at each of the project partners, to ensure that all useful results are identified, developed, and exploited as soon as possible. The process begins with the identification of exploitable results, with the focus being on the commercial, societal, and political implications, thereby contributing to the commercial and political agendas of the EU, with a special focus on research infrastructures. In CONVERGE, a wide range of research outputs can be considered exploitable, including policy recommendations or standardisation activities (having a dedicated activity), and we will develop effective plans to maximize the impact of CONVERGE on the academic, industry, economy, and society as outlined below. The following exploitation paths are anticipated:

- Identification and tracking of exploitable results: all project partners will formally identify and track exploitable results in a register document which will be updated and developed throughout the project. These results include any IP which has the potential to be used outside or after the project, e.g. new or improved manufacturing processes, methods, designs, devices or products. The progress of these results will be tracked and assessed throughout the project, including the identification and development of exploitation routes.
- Intellectual Property Rights (IPR): IPR exploitation will be explored through patenting or other appropriate means (e.g. utility models, licensing) as well as through marketing protected IPR to attract third-party license users or establishing new companies on behalf of IP owners.
- Market watch: all partners will provide updates on external activities relevant to the project, such as market news and academic results, which will be compiled into regular market watch reports.
- Identification of commercialization opportunities: by conducting market research (that may be subcontracted or resourced by Technology Transfer and Commercialization Teams at partner institutions), partners will identify potential commercialization opportunities associated with the CONVERGE toolset or parts of the toolset.
- Dissemination/exploitation group: as part of activities ongoing throughout the project, all partners will be expected to continue to grow a group of interested parties (aiming at > 100 contacts), starting from the SLICES-SC and 6G-IA community, and including companies, universities, and other RIs and their wide user base. These links will be established by direct personal recommendation, business meetings, website enquiries, contacts at conferences, exhibitions, dissemination events, workshops. This group will be used as a distribution list for newsletters, promotional videos, and the website feeds. This activity will create an avenue for exploitation of project results.
- Exploitation target groups: the target groups for the exploitation plan include potential customers and partners in the field of wireless communications, computer vision, sensing and machine learning as well as from the associated market vertical segments. These can include companies and organizations involved in the development, manufacturing, and deployment of wireless communications and smart city infrastructure, industrial automation systems, autonomous driving/public transportation, health and media production, among others. The project will also target research institutions, academia, and industry experts who can provide valuable insights, expertise, and collaborations for further development and commercialization of the technology.
- The organization of a dedicated technology transfer Workshop at a highly visible event such as a flagship conference of IEEE ComSoc will be carried out as part of the project's exploitation activities. This workshop is planned towards the end of the project, aimed at an expert technical audience to present the project results and generate interest for exploitation

routes. This will include presentations from project partners, including partners from the USA, and guest speakers from related HE projects, and other RIs.

Table 3 describes planned exploitation routes and specific expected impact of the project within each of the partners.

Table 4 - Expected impact of the project in each of the partners

Partner	Exploitation plan per partner
INESC TEC	Through CONVERGE, INESC TEC will deploy part of the developed toolset at its CONVERGE-PT RI, namely the vision-aided large intelligent surface and mobile base station as well as the two virtual tools 3D environment modeller/vision-radio simulator and ML algorithms for dataset analysis, and therefore boost its scientific competitiveness and reputation as a research infrastructure. It will also increase the attraction of international students and improve the links especially with regional and national companies who will be interested in using the toolset or the obtained datasets for the development of new products and services. The training programs offered in the scope of CONVERGE will benefit the RI staff and will support a higher scientific excellence of MS/PhD students in their studies, further opportunities for intellectual property exploitation and potentially the creation of new spin-off companies.
University of Oulu	The UOULU exploitation plans for CONVERGE include showcasing obtained results at key events and promotion of CONVERGE toolset use and the UOULU open 5G Test Network Partner facility ecosystem and beyond, aimed at rapid business development. Exploitation after the project includes: 1) actively sharing the CONVERGE project results within the industrial consortium partners beyond SNS realm; 2) making CONVERGE results available at UOULU facility as a part of the 5GTN (5G Test Network) for increasing visibility and market uptake of the project outcomes. The 5GTN will also evolve towards the 6th Generation facility via the National 6G Flagship program related activities. UOULU plans also to introduce its assets to the operational production network at the university and also for educational purposes especially in ICT related but also in multi-disciplinary fashion between all faculties in UOULU.
Barcelona Supercomputing Centre	The impact of the CONVERGE project on BSC will be manifested at two levels: 1) internally, through an increase of the expertise level in data analytics in areas not traditionally addressed by BSC. This can lead to new collaborations and getting involved in projects in new areas; 2) externally, through the deployment of the ML tools locally and making them available to a growing user base that includes research institutions, universities, and the industry.
Eurecom	This project will be leveraged to pass a major milestone in the development of OpenAirInterface. The close joint effort between radio, LIS and video teams will accelerate Eurecom's 5G+ developments. The project results will have a significant impact on research facilities enabled by open interfaces and interoperable hardware. Research facilities will increase the knowledge base in the area of Open RAN and core as well as 5G architecture, private networks, integration and operator models. The developed software solutions can be reused in future projects or licensed to third parties. The integration and dissemination of the software solutions developed by the individual partners into a functional 5G+ system gives each

	consortium partner a significantly higher exploitation potential than component-level exploitation by each individual partner.
Sorbonne University	Sorbonne University exploitation plan for CONVERGE is centred on exploring new demands for experimentally driven research in the domain of digital infrastructures and value in the SLICES ESFRI project. This will contribute to leverage a broader adoption and impact of the SLICES ESFRI project that Sorbonne is coordinating. It also includes a growing attractivity for students and the socio-economic stakeholders. As such, CONVERGE will help extend the training activities that will be valuable for Sorbonne students and beyond. Finally, CONVERGE will pave the way towards a better understanding about how a new demand for testing can benefit from SLICES and be integrated.
INRIA	INRIA will leverage CONVERGE results by deploying vision-aided large intelligent surface and 5G base stations as well as the 3D environment modeller/vision-radio simulator. The project will therefore increase the knowledge in the area of OpenRAN, 5G architecture, and vision-radio simulation. Project results will also be exploited to extend the services proposed by the SLICES-RI facility to larger communities including researchers, industrials and MSc and PhD students.
CSC - IT Centre for Science Ltd.	CSC's effort aims at fostering an interoperability approach with regards to services and data. This includes working on technical and organisational aspects and providing direct support to repositories for increasing their discoverability e.g. within EOSC. The CONVERGE project will enable CSC to support the National 6G Flagship program related activities ensuring open access of the data and FAIRness of data and services. IoT, sensor networks and edge computing are areas where there exist growing needs in CSC's research customer base, urging CSC to develop skills, competences and systems to cope with this up-coming growth.
Queen's University Belfast	From the development of new sensing and imaging modalities to the realization of software-defined metasurfaces, CONVERGE will create a multi-disciplinary research environment in CWI RI in Belfast. Due to its interdisciplinary nature, CONVERGE will invoke a broad scientific interest across various disciplines at Queen's University Belfast, particularly in engineering, physics, information technology and data science. Through CONVERGE, QUB will be an integral part of the LIS community in Europe, playing a leading role in applied electromagnetics. This program will place QUB in a unique position in Northern Ireland, ensuring the training of the next generation of skilled scientists, engineers, and researchers. We anticipate that successful implementation of this program will also substantially increase the student intake, and lead to the creation of new spin-off companies, and hence jobs, and new IPs, in line with the strategic vision of QUB, which is the 1st in the UK for entrepreneurial impact and commercializing research.
Allbesmart	Allbesmart offers outsource engineering services to design and develop customized open-source implementations of 3GPP wireless protocols to accelerate 5G and 6G product development. Allbesmart is an associated member of the OpenAirInterface (OAI) Software Alliance and a key contributor to the open-source project. The OAI extension for 6G will be an important tool to develop early prototypes and demonstrators for validating key design aspects in the lab environment to the standardization process in 3GPP. The CONVERGE project will allow Allbesmart

	to test and mature 6G features sufficiently to offer it to our commercial partners and to approach potential new partners for proof-of-concept testing and trials.
Greenerwave	Greenerwave develops electronically tunable metasurfaces and the algorithms needed to control electromagnetic waves using these metasurfaces for a range of applications, including Large Intelligent Surfaces for 5G sub-6GHz and mmWave communication. The tools and expertise that will be developed within the CONVERGE project will help Greenerwave to test its cutting-edge technologies as parts of a large telecommunication infrastructure as well as to enhance the competitiveness of its products on the world market.
Adapttech	Adapttech is a company focused on improving the quality of life for people with physical limitations. Their strategy is to revolutionize the prosthetics market by becoming the key player in data processing and acquisition for lower limb amputees. The prosthetics market currently faces 3 main challenges: Socket Fitting, Functional Level Assessment, and Prosthetic Device Alignment. This project can support the company efforts to develop a new product focused on analysing the patient mobility and posture in order to improve the prosthetic device alignment and determine accurately the level of functionality, and consequently the adequate prosthetic componentry. This can be achieved by the development of a system that combines computer vision and IMU data in order to create a model of the amputee, and extracting the optimal parameters of posture, gait and device alignment. The Model can then be applied to improve the fitting of new amputee's using only the IMU data to extrapolate the best fitting during daily activities.
InterDigital Europe Ltd	InterDigital is one of the world's leading organizations in terms of in-house innovation and technology creation. They are involved in global standardization contribution in the wireless domain. The CONVERGE project aims to increase InterDigital's disruptive technology and innovation creation on Reconfigurable Intelligent Surfaces (RIS), where they already have a strong involvement in both 3GPP and ETSI standardizations. The technologies that InterDigital will create within CONVERGE on Reconfigurable Intelligent Surface applications will be disseminated to these standardization bodies, whilst increasing the company's contributions to beyond-5G and 6G and also licensing opportunities to device and network manufacturers. Moreover, InterDigital will significantly benefit from the wide range of expertise that will be available in the CONVERGE that will allow the company to broaden its knowledge base and also provide additional market and technology development opportunities.

Advisory Board

An external group of advisors will be part of CONVERGE. This board will help develop exploitation strategies and align the project objectives with industrial and end-user requirements, help define its use cases and validate key decisions. This board consists of the following members:

- Andreas Mueller is the Head of Communication and Network Technology in Robert Bosch GmbH in Stuttgart, Germany and Chief Expert for communication technologies for the IoT. He also serves as General Chair of the “5G Alliance for Connected Industries and Automation” (5G-ACIA), which is the globally leading organisation for driving and shaping Industrial 5G.
- Olli Liinamaa has had a long career at Nokia in R&D and product management. In his current role as Ecosystem Manager he is responsible for Nokia/Oulu cooperation within the ICT industry, academy and public sector.

- José Pedro Borrego is a Deputy Director-General for Information and Innovation at ANACOM, the Portuguese Regulatory Authority for Communications. He developed his career as a senior radio engineer, at the Spectrum Control and Monitoring Centre. He is the Chairman of the URSI Working Group E6 on Spectrum Management.
- Naser Damer is a Senior Researcher at Fraunhofer IGD, as a member of the Competence Centre 'Smart Living & Biometric Technologies. He is also a Principal Investigator at the National Research Centre for Applied Cybersecurity CRISP in Darmstadt, Germany. He represents the German Institute for Standardisation (DIN) in ISO/IEC SC37 biometrics standardisation committee.
- Carlos Cordeiro is the CTO of wireless connectivity at Intel Corporation, where he is responsible for next generation wireless connectivity technology strategy, standards, ecosystem engagements, and regulatory. In the Wi-Fi Alliance, he is a member of the Board of Directors and serves as its Technical Advisor.

While informal interaction with the Advisory Board will happen continuously throughout the project, formal interaction moments will occur near key project milestones. For example, the advisory board was invited to a formal presentation of the project use cases and requirements in July 2023 and provided valuable feedback and insights that helped to improve the writing of Deliverable D1.1.

5. STANDARDISATION AND OPEN-SOURCE COMMUNITIES

CONERGE primary objective is to maximize the impact of its innovations within current and future standardization and industry forums, thus creating opportunities for commercial exploitation. This section outlines the first plan for standardization and open-source activities along with their initial accomplishments. It is organized based on the phases of the roadmap and the relevant Standards Development Organisations (SDOs). The plan revolves around making significant contributions to major global Standards SDOs such as 3GPP, IEEE, and ETSI, with the aim of shaping and influencing their processes.

In the context of standardization activities, a number of partners will be monitoring different work groups in different SDO and reporting these activities into relevant WPs in the project. The results reported in different WPs (e.g., WP1, WP2 and WP3) will be identified for potential dissemination in different SDOs.

5.1 Standardization Roadmap

The standardisation roadmap comprises several phases distributed over a specific period, where each phase has a set of predefined requirements and inputs.

- **Technical Requirements:** The technical requirements of CONVERGE are defined in D1.1. This phase starts with defining the system architecture with its individual components related to each toolset. Specifically, the requirements identify the different interfaces between different components of the system including the network deployment scenarios, design of the BS, RIS and UEs interconnected with an array of camera.
- **Identification of missing Requirements for CONVERGE:** Identify the missing requirements for CONVERGE in any SDO. These requirements could be identified based on the activities in WP2 and WP3 throughout the project.
- **Anticipated Contributions:** Based on the missing requirements partners will analyse and anticipate potential contributions. The anticipated requirements could be based on the innovations in WP2 and WP3.
- **Active Contributions:** After anticipating a potential contribution to a specific SDO, a contribution can be prepared by relevant partners.

5.2 Standardization Activities

This section presents the SDOs corresponding to working groups and activities that are relevant to CONVERGE project scope. The CONVERGE advisory committee collects information from members who are participating, contributing, and monitoring to different SDOs.

5.2.1 3GPP

3GPP covers a wide range of telecommunications technologies, which include radio access networks (RAN), service capabilities and core networks (CN). 3GPP specifications and technical studies are based on contributions by member companies and organizations that are actively participating in working groups. In 3GPP, there are three main technical specification groups (TSGs), which include radio access networks (RAN), services and systems aspects (SA) and core network and terminals (CT). This SDO is one of the primary targets of CONVERGE.

CONVERGE partners will be monitoring standardization activities in 3GPP and report to the consortium. Potential opportunities in 3GPP are RAN1 and RAN4. Different CONVERGE system components could be mapped to a specific work group. For example, although Reconfigurable

Intelligent Surfaces (RIS) has not been specified in the current specification phase, it may however be considered in future releases. In this context, the different phases of RIS standardization activities are shown in Figure 9. Currently, the RIS is still part of the pre-standardization activities (e.g., ETSI ISG RIS), but could be mapped into future releases. As shown in the figure, after the pre-standardization stage the initial case studies on RIS could start in Rel-19, and more advanced proposals could be discussed in Rel-20+ releases.



Figure 9 - RIS phases in 3GPP.

5.2.2 ETSI

The European Telecommunication Institute (ETSI) is an independent European standards organization in the field of information and telecommunications. In ETSI, standardization work is carried out in different committees, which are of different types and aims. The main types of technical groups in ETSI are namely: Technical Committee (TC), ETSI Project (EP), ETSI Partnership Project and Industry Specification Group (ISG).

In CONVERGE, there are opportunities to engage and disseminate the project results into two ISGs, namely ISG RIS and ISG THz:

- ISG RIS: This ISG was launched in September 2021 and is responsible for streamlining pre-standards efforts on Reconfigurable Intelligent Surfaces (RIS) technologies and applications. Specifically, this ISG captures the work related to the use cases and deployment scenarios for RIS, and identifies the set of relevant RIS components, which are important for paving the way for future standardization in 3GPP. Interdigital chairs this ISG.
 - CONVERGE can be proactive in engaging and contributing to ISG RIS by disseminating the results from WP1, WP2 and WP3 into relevant work items.
- ISG THz: This ISG is responsible for streamlining pre-standards efforts on Tera Hertz (THz) communications (0.1 – 10 THz). Interdigital is the Secretary of this ISG.
 - CONVERGE can be monitoring different work items in ISG THz through published technical contributions.

5.2.3 O-RAN

Open Radio Access Network (O-RAN) is an organization driven by member operators and vendors, which focuses on the RAN part of the mobile network. It was first introduced in 2018 and was an evolution of 3GPP's Rel-15. CONVERGE will be monitoring relevant activities and report back to the project.

5.2.4 Other

Other SDOs were reported by different partners, which can be relevant to the project, such as

- AIOTI
- ETSI Electromagnetic compatibility and Radio spectrum Matters (EMC and ERM)

The contributions of CONVERGE to standards developing organizations are summarized in Table 4.

Table 5 - CONVERGE contributions to standardization bodies.

SDO	Main Contributors	WP	Description
3GPP	INTERDIGITAL, EURECOM	WP2, WP3	Monitoring activities and report to the project. Potential opportunities for active participation in RAN1 through liaison statements and white papers.
ETSI	INTERDIGITAL, INESC TEC, GREENERWAVE, Adaptech	WP1, WP2, WP3	Monitoring activities and report to the project and disseminating results to relevant ISG and work items (ISG RIS, ISG THz, ERM)
O-RAN	SORBONNE	WP1, WP2, WP3	Monitoring 5G and 6G related activities and report to the project. Include CONVERGE components to the O-RAN architecture.
AIOTI	INESC TEC	WP1, WP2, WP3	
6G-IA	INESC TEC, SORBONNE	WP1, WP2, WP3	

6. TRAINING

One of the objectives of WP4 is to organize and deliver training events for CONVERGE with the goal of promoting CONVERGE research infrastructure and fostering the engagement of the external R&D community on experimentation in the convergence of radio and vision and associated machine learning. The training events will target getting novice and expert users, from multiple disciplines, acquainted with the tools and infrastructure of CONVERGE research infrastructure. This involves also information exchange between partners of the project. In detail, the technical objectives set by this training activity are the following:

- to identify the training needs and training methodologies that will be followed
- to develop and provide the respective training material to organize CONVERGE training events (training sessions, webinars, plugfests, hackathons)
- to facilitate researcher mobility for the exchange of know-how among the users of the facilities.

6.1 Researcher Mobility

The CONVERGE Researcher Mobility programme targets members of the consortium, as well as researchers not affiliated with any of the consortium partners, who want to use CONVERGE facilities in other countries to conduct their experimentation. There are two mobility categories:

- **Researcher Mobility for Knowledge Transfer.** This is a short mobility program (typically of one week) that is meant only for training (i.e., learning the infrastructure of a CONVERGE site and how to use it), and it is reserved to the members of the consortium. Some initial meetings in WP2 have quickly revealed that there will be a need for knowledge transfer for infrastructure components that are developed by one partner and are co-developed or used by another partner.
- **Researcher Mobility for Micro-project.** This is a longer mobility program that is meant for carrying out a micro-project with a tangible scientific output for CONVERGE (e.g., a dataset, a software package, an infrastructure component, a joint collaboration for a publication, or official technical report), and it is open to both members of the CONVERGE consortium and researchers not affiliated with any of the consortium partners. This mobility program is intended to contribute to the knowledge transfer outside the consortium and the wider take-up of the CONVERGE research infrastructure.

The need for the first type of researcher mobility will arise early on in the project while some of the mobility of the second type may occur later on when some of the research infrastructure gets stabilized.

6.2 CONVERGE Summer School

Beyond individual researcher mobility, a Summer School allows to provide training to a wider group of researchers and users. Such an event will typically be organized at the premises of one of the partners. A three-day school allows to take a deep dive into some of the available open-software and hardware solutions for building experimental telco networks that can be used by researchers to develop innovations leading to 6G network architectures in initiatives such as CONVERGE, SLICES-RI, PAWR, Fabric and Horizon Europe SNS JU. A key objective of the school may be to highlight cloud-native tools leading to fully converged cloud and telecommunication infrastructures. The school may cover initiatives including O-RAN, ONF Aether/SD-Fabric/SD-RAN, OpenAirInterface RAN and Core, Mosaic5G, Magma and related cloud-native frameworks based on Kubernetes. In addition, for newcomers to the 3GPP ecosystem, the school can also provide a crash course on 3GPP networks and

protocols. The attendance for the summer school can be made hybrid, to spread the instruction beyond attendees who are physically present.

6.3 Webinars

Similar to the related activity by the OpenAirInterface (OAI) Software Alliance, the CONVERGE consortium will launch a Webinar series, a way for the OAI community to engage with the OAI team.

Every two months, architects and engineers from the OAI team as well as those from the wider OAI community speak on different topics covering ongoing work in one of the three OAI project groups: RAN, Core Network, and MOSAIC5G.

The webinars are announced on the mailing lists and social networks. The project webpage will contain the archived webinar videos for those in the community who may want to catch up later.

As an example of a recent OAI webinar: **OAIBOX: OpenAirInterface for 5G research and education in a box**, which was presented by on 28.03/2023 by a CONVERGE partner (Luis Pereira (Allbesmart)), with the following abstract:

The OAIBOX is a plug-and-play 5G test solution based on OpenAirInterface. It has a cloud-based Dashboard for real-time monitoring and control of gNB and CN5G. In this session, we will first present the OAIBOX product line, including the free version of the OAIBOX Dashboard. Following, we will give a live demo of some 5G Lab experiments, following step-by-step instructions from the freely available 5G LAB MANUAL. Lastly, a Q&A will be there to get attendee feedback and answer their questions. Join us in this webinar to learn more about the OAIBOX, a transformative approach to use OAI for 5G education, research, and experimentation.

6.4 Training Workshops

Again, EURECOM and OAI organize regular workshops, at present twice a year. The purpose of these events is to report recent developments in the OAI, publicize the newest projects and collaborations, teach OAI to new members, and give existing members and the broader community an opportunity to meet, discuss and show their recent work.

As an example, the most recent workshop: Spring 2023 OpenAirInterface Hands-On Workshop. This workshop has been designed with an emphasis on training the attendees on OAI software. The OAI experts gathered for two days to address the latest progress in the codebase made over the past year. The workshop demonstrated how OpenAirInterface has made significant strides in becoming a reference implementation for the 3GPP and O-RAN specifications. The complete two-day program can be found here: <https://openairinterface.org/spring-2023-openairinterface-hands-on-workshop/> and included a presentation by a CONVERGE partner (Damien Saucez (INRIA)) on the Deployment of the Slices Project Blueprint.

6.5 O-RAN Plugfests

EURECOM interacts directly with the O-RAN Alliance and has recently signed an MoU to foster development of an OAI-based OpenRAN solution and provide testing of technologies in the context of the O-RAN next-generation research group (nGRG). (O-RAN Press Release Mar. 2023).

EURECOM organizes and hosted the O-RAN Spring 2023 EU plugfest at its premises. These events allow integration of external partner hardware (radio-units and distributed-unit testers) for

interoperability testing. Development is now part of the open-source repository maintained by EURECOM and the OpenAirInterface (OAI) software alliance. This effort made use of existing open-source libraries from the O-RAN software community (O-SC) (fronthaul interfaces) allowing integration of OAI and O-SC software. This is an ongoing integration effort in the OAI community allowing replication of an O-RAN compliant fronthaul network in partner laboratories and will constitute an important element of the CONVERGE training activities.

7. ENGAGEMENT WITH OTHER RESEARCH INFRASTRUCTURES

Beyond dissemination/communication and exploitation (including standardisation), a key objective of WP4 is to effectively engage with other RIs, which is achieved through a dedicated task (Task 4.4). The objective of this task is to engage with other research infrastructures and stakeholders. We will develop actions in order to ensure continuous interactions with a wide community of RI users to constantly align user needs and tools interfaces and capabilities definition, to promote joint collaboration with other RIs and companies, technology transfer and innovation, as well as encouraging RIs to be a supplier for industry support. This is of paramount importance in order to strengthen the impact assessment of the RIs. Moreover, this task will concentrate on the facilitation of the methodologies, the adoption and usage of tools and services that will enable broader thematic clustering and RI interrelationship that will be realized through joint networking activities. The goal is to link industry and science on a series of common actions towards experimentation, verification and reproducibility of scientific results, thus converting raw results stemming from basic and applied research into innovative methods, tools and/or products.

Consequently, a key activity to support the future impact of the CONVERGE project is the engagement with other RIs and similar initiatives not only in Europe but worldwide. This will be of utmost importance to engage CONVERGE into the ESFRI community and the best practices that its projects have developed. This will guarantee the long-term impact of the project. Moreover, the targeted community addressed by CONVERGE is larger than the SLICES-RI community since it relates closely to vertical markets in the telecommunications, automotive, health, manufacturing, and media sectors. Therefore, raising awareness of these communities about scientific research instruments and the full research life cycle is key.

In addition to that, it is important to remind that both CONVERGE and SLICES will benefit from the experience and outcomes of each other: CONVERGE will benefit from the nodes and the number of users of SLICES to test and extend its toolset while SLICES will benefit from the services of CONVERGE to cover other sectors and a wider community.

Nevertheless, as a starting point, the dissemination and collaboration strategy with other RIs will focus on SLICES-RI. Based on the first outcomes of this plan, the project will extend its strategy to other RIs as part of Task 4.4, when found relevant.

7.1 Description and characteristics of SLICES-RI

<https://www.slices-ri.eu/>

SLICES is a flexible platform designed to support large-scale, experimental research focused on networking protocols, radio technologies, services, data collection, parallel and distributed computing, and in particular cloud and edge-based computing architectures and services.

SLICES consortium gathers partners from 15 European countries and has received the endorsements of key stakeholders and the political support of 12 European Governments. SLICES is currently integrated into the 7 national roadmaps: France, Greece, Italy, The Netherlands, Switzerland, Norway, and Poland.

A significant step forward in the creation of the SLICES Research Infrastructure was the inclusion of SLICES in the ESFRI 2021 roadmap, thanks to the commitment of the partners and the above-mentioned supports. In parallel, three EU projects are currently ongoing under the umbrella of SLICES and mark significant milestones towards the fully operational phase of the RI: SLICES-DS [1] (design study – finalised in 2022); SLICES-SC [2] (starting community); SLICES-PP [3] (preparatory phase).

Among the goals of SLICES, we can highlight that the RI aims to engage, in a long-term and sustainable, and aligned way, communities involved in:

1. Novel Digital Infrastructure technologies and paradigms;
2. Future Internet large-scale testbed development and operation;
3. Operation of Platforms as a Service;
4. Development of the software necessary to control and manage the RI. It will also link the communities with transversal (vertical) applications and provide synergies between academia, industry, and business actors.

To achieve this goal, SLICES is addressing (i) the research infrastructure dimension and technologies, (ii) the FAIR data and reproducibility, (iii) the capacity building and education. It will involve stakeholders from the supply side to the demand side, enabling the testing of new technologies but also accelerating the deployment of transformative services.

These objectives will be reachable thanks to the experience and expertise of the SLICES partners on the operation and experimentation with real infrastructures, covering the following areas:

- Advanced wireless networking
- Smart infrastructure operation and management
- Design and validation of new distributed infrastructures and hyper-converged infrastructures
- Energy efficiency and carbon footprint
- Security and privacy

7.2 CONVERGE integration into SLICES

As previously stated, one of the objectives of the CONVERGE project is to develop an innovative toolset that will be deployed into different infrastructures mostly aligned with SLICES-RI in order to improve their competitiveness.

Thanks to the participation of several SLICES members in CONVERGE (Sorbonne University, INRIA, EURECOM, and UOULU), the integration of the project toolset will be progressive to guarantee its proper alignment with SLICES in different fields such as access modes and policies, Open Science and Open Innovation (following the ESFRI methodology), user interface and connection with EOSC. The final goal is to create a credible path for the future exploitation of the developed toolset.

As there exist some overlaps in the scientific questions addressed by both projects, SLICES solutions and practices will be onboarded into the CONVERGE project and progressively extended to new technologies covered exclusively in CONVERGE (which is the case of Computer Vision technologies).

7.3 SLICES community building strategy and replication to CONVERGE

In parallel and as a support to the technical work, the CONVERGE's dissemination and exploitation strategy will aim to contribute to the integration into SLICES-RI but also to present the CONVERGE solution to other potential users and infrastructures. The activity related to the engagement with other RIs, at an early stage of the project, is essential to ensure the success and impact of CONVERGE. To facilitate this, the project partners will organise and propose a series of training sessions and events, as well as the dynamization of an Advisory Board (described in the previous section) and creation of a dissemination/exploitation group. This group will help to identify the main stakeholders (at least >100 contacts), from related projects and RIs, (starting from SLICES and 6G-IA communities) and invite them to take part in joint workshops and activities (e.g., contributing to the organisation of the planned technology transfer workshop). This target group will include companies, universities, and other RIs and their wide user base.

Based on the SLICES experience (especially SLICES-SC), the CONVERGE strategy will join and/or replicate part of the activities already defined in SLICES-SC, and when possible, be directly involved in community-building activities proposed by this RI.

Among the activities defined in the SLICES community-building strategy, the focus will be put on the activities described in Table 5.

Table 6 – Replication to CONVERGE of SLICES-SC activities.

SLICES-SC activities	Replication to CONVERGE
<p><u>SLICES events & workshops</u>: a series of events and workshops are planned during the duration of SLICES-SC project (at local, European, and international level). To guarantee a wider audience, these events are collocated with other international events, when possible (e.g., EuCNC, Globecom, Mobicom, etc.). Some events are co-organised with international partners, for instance the PAWR office.</p> <p>SLICES also plans to organise hackathons.</p>	<p>CONVERGE will propose its own list of events and workshops. A significant overlap exists.</p> <p>Joint events and/or hackathons with SLICES or other RIs can be proposed.</p>
<p>SLICES Academy [4]: The purpose of this portal is to propose to the community a single-entry access point to all the training material developed in SLICES (not limited to SLICES-SC), such as recorded training events (e.g., summer schools), webinars, theNetworkingChannel, MOOCs and a code repository. At an early stage, the content will mainly consist of the existing courses and training material developed by the SLICES partners. The objective is to quickly propose content designed and developed by the RI itself.</p>	<p>On the one hand, the training material developed in the framework of CONVERGE can be also published on the SLICES Academy portal to reach the wider possible audience.</p> <p>On the other hand, the training material developed by the consortium will be published on both the CONVERGE website and a dedicated YouTube channel.</p>
<p>TheNetworkingChannel [5]: launched during the pandemic and promoted by the EMPOWER [6] project (coordinated by Sorbonne University) and the PAWR [7] office, its goal is to propose a series of events as an online “channel” where the global networking research and education community will be able to meet and share.</p> <p>The discussions are scheduled for every other Wednesday, at 8 am PST (11 am EST, 5 pm CET, 1 am JST). The sessions are recorded and available on the dedicated YouTube [8] channel.</p> <p>The Channel is now supported by SLICES and is an efficient tool to disseminate on SLICES and reach potential users and RIs, beyond the European community (USA, Brazil, Japan, etc.).</p>	<p>CONVERGE can participate in some of the sessions and present its toolset as a solution for the community.</p> <p>This kind of event usually targets worldwide users and RIs.</p> <p>A full replication of this tool is not considered at this stage.</p>

7.4 CONVERGE’s RI engagement beyond SLICES

Once the RIs engagement strategy has been fully tested on SLICES, the CONVERGE consortium will replicate it to the other similar projects and RIs, mostly in, but not limited to, Europe.

Among the RIs identified at this stage, we can highlight the following three ESFRI projects, and landmarks. All of them belong to the “data, computing and digital infrastructures” domain. Depending on the evolution of CONVERGE and its needs, the partners will explore other RIs belonging to other ESFRI domains.

- EBRAINS [9] – European Brain ReseArch INfrastructureS (project)
 - Topic: Health.
 - Countries: FR; BG; CH DK; EL; ES; IT; NL; NO; SE.
- SoBigData++ [10] – European Integrated Infrastructure for Social Mining and Big Data Analytics (project)
 - Topic: Social data analysis.
 - Countries: IT; BG; CH; EE.
- PRACE [11] – Partnership for Advanced Computing in Europe (Landmark)
 - Topic: Computer science.
 - Countries: CH; DE; ES; FR; IT; AT; BE; BG; CY; CZ; DK; EL; FI; HU; IE; IL; LU; NL; NO; PL; PT; SE; SI; SK; TR; UK.
- EGI [12]: A special emphasis will be put on EGI that is the federation of computing and storage resource providers united by a mission of delivering advanced computing and data analytics services for research and innovation.

In addition to the above-mentioned RIs, the CONVERGE partners will also engage with other similar projects or initiatives, such as the ones listed below. Several members of these projects are also partners in the identified RIs and will help the CONVERGE consortium to reach out to these RIs.

- Hexa-X [13]
- Meta-Wireless [14]
- RISE-6G [15]
- EUDAT Collaborative Data Infrastructure [16]
- AIMM [17]
- ETSI ISG RIS [18]
- 6G Flagship Program [19] (Finland)
- 5GTN [20] (Finland)
- COSMOS [21], POWDER [22], AERPAW [23], ARA [24], COLOSSEUM [25] (USA)
- 6G/B5G Promotion Strategy [26] (Japan)
- IMT-2030 Promotion Group [27] (China)
- ETRI [28] (South Korea)
- Belfast Region City Deal [29] (United Kingdom)
- ns-3 network simulator [30]

Consequently, a significant impact on the number of operators and future users that will seek to use the CONVERGE toolset to design, conduct and assess their experimentation is expected to rise through the adoption of common tools and frameworks that are respectively used in their in-house R&D activities.

8. CONCLUSIONS

This deliverable has presented the project's plans and measures to ensure the successful dissemination, communication, and exploitation of its results. In its first 6 months, the CONVERGE consortium has identified the relevant venues to publish project results and organise events, has set up a communication infrastructure (media kit, web page, templates, social media accounts), defined the possible paths towards exploitation both at consortium level and partner level, described its plans for training, and identified the opportunities to increase the impact of the expected results by influencing standardisation as well as by engaging with other RIs, especially SLICES, but going beyond to other RIs and initiatives worldwide.

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