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D7.2 INTERMEDIATE REPORT ON STANDARDIZATION, DISSEMINATION AND EXPLOITATION OF RESULTS

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Abstract	This document presents UNITY-6G's Intermediate Report on Standardization, Dissemination, and Exploitation of Results, providing a comprehensive review of the activities conducted during the project's first 18 months. It evaluates the implementation of the strategic framework established in D7.1, documenting the project's progress in communication, community-building, and technical outreach. The report assesses the effectiveness of the tools and channels deployed to date, analyzes the consortium's contributions to global standardization bodies, and updates the individual exploitation pathways for all partners. By comparing achieved results against initial Key Performance Indicators (KPIs), this document ensures the project remains aligned with its impact goals and provides an updated roadmap for the final 18 months of the UNITY-6G lifecycle.
Keywords	Communication, dissemination, stakeholder engagement, outreach, liaisons, standardization, exploitation, impact creation

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EXECUTIVE SUMMARY

This document provides a detailed reporting and evaluation of the activities performed to maximize UNITY-6G's visibility and impact during its first half (M1–M18). It serves as a transition point, evaluating the effectiveness of the initial strategic framework while refining the methodologies and tools that will guide the consortium in the second half of the project. The report is structured around the three interconnected pillars that define the project's outreach and sustainability:

- **Communication, dissemination, and community building:** A comprehensive assessment of the tools and channels deployed, including the visual identity, web presence, social media engagement, and the production of scientific publications and white papers. It highlights the successful growth of the UNITY-6G stakeholder community and the impact of the consortium's presence at international events and workshops.
- **Standardization:** A review of the technical contributions made to date within relevant Standard Development Organizations (SDOs), such as 3GPP and ETSI. This section documents the active roles held by partners and the progress made in influencing the emerging 6G technical landscape.
- **Exploitation:** An update on the management of Intellectual Property (IP) and the evolution of individual exploitation strategies. This ensures that the innovations generated by UNITY-6G are mapped toward clear commercialization pathways, academic legacy, and industry adoption.

By measuring these activities against the project's Key Performance Indicators (KPIs), the report confirms that the consortium has built a strong foundation for impact creation. Furthermore, this document provides an Updated Strategy for M19–M36, describing our outreach and exploitation tactics to reflect the maturing technical results and evolving stakeholder needs. This ensures that UNITY-6G maintains its momentum and maximizes its long-term contribution to the global 6G ecosystem.

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ABBREVIATIONS

AI	Artificial Inteligence
AP	Access Point
API	Application Programming Interface
ATIS	Alliance for Telecommunications Industry Solutions
B5G	Beyond Fifth Generation Cellular Network Technology
D	Deliverable
dApps	Decentralized Applications
DOI	Digital Object Identifier
DLT	Distributed Ledger Technology
EC	European Commission
ENI	Experiential Networked Intelligence
ESA	European Space Agency
ETSI	European Telecommunications Standards Institute
ICT	Information and Communication Technology
IEEE	Institute of Electrical and Electronics Engineers
IP	Intellectual Property
ITU-T FG-AINN	International Telecommunication Union (ITU-T) Focus Group on Artificial Intelligence Native for Telecommunication Networks
KER	Key Exploitable Result
KPIs	Key Performance Indicators
M	Month
MWC	Mobile World Congress
NTN	Non Terrestrial Networks
O-RAN	Open Radio Access Network
RAN	Radio Access Network
SDOs	Standard Development Organizations
SNS JU	Smart Networks and Services Joint Undertaking
TN	Terrestrial Networks

TSN	Time-Sensitive Networking
UBBA	Utility Broadband Alliance
ZSM	Zero-touch network and Service Management
3GPP	3rd Generation Partnership Project
3GPP SA5	3GPP Service and System Aspects Working Group 5
6G	Sixth Generation Cellular Network Technology
6G-IA	6G Smart Networks and Services Industry Association

1 INTRODUCTION

1.1 PURPOSE OF THE DOCUMENT

Following the strategic foundation laid out in D7.1 *Dissemination, Standardization, and Exploitation Plan*[1] (submitted to the EC in March 2025), this document serves as the formal assessment of UNITY-6G's impact creation strategy. The purpose of this document is twofold. First, it provides a transparent audit of communication, dissemination, and standardization activities conducted to date, measuring their effectiveness against the project's KPIs. Second, it serves as an operational update; it incorporates the lessons learned from the first half of the project to refine the strategy for the remaining 18 months (M19–M36). This ensures that the consortium's efforts remain synchronized with the maturing technical outputs and the evolving global 6G landscape.

1.2 UNITY-6G MISSION AND PROJECT STATUS OVERVIEW

The Information and Communication Technology (ICT) sector faces a critical sustainability challenge, with communication networks projected to reach 20% of global electricity usage by 2025[2]. In response, UNITY-6G is dedicated to addressing these energy and environmental concerns by developing a highly sustainable, scalable, and AI-native architecture. By integrating advanced technologies such as Distributed Ledger Technology (DLT), semantic communications, and digital network twinning, the project seeks to enhance the cost-efficiency and trustworthiness of integrated 6G services across the edge-cloud continuum.

A core component of the UNITY-6G mission is the evolution of a real-time, network state-aware Open RAN, leveraging complementary distributed software functions alongside xApps and rApps to enable data-driven management for use cases with strict timing and reliability requirements. As the project moves into its second half, the technical focus shifts from the definition of these common interfaces and service-based architectures toward the validation of these innovations through digital twins and integrated network demonstrators. Consequently, the communication, dissemination, standardization, and exploitation activities detailed in this report are designed to ensure these technical breakthroughs contribute effectively to the global transition toward a more resilient and sustainable communication infrastructure.

[1] https://unity-6g.eu/wp-content/uploads/2025/04/UNITY-6G_D7.1.pdf

[2] https://www.iea.org/reports/world-energy-outlook-2024

2 COMMUNICATION, DISSEMINATION, AND COMMUNITY BUILDING M1-M18

2.1 COMMUNICATION AND DISSEMINATION STRATEGY: SUMMARY OF THE APPROACH TAKEN

The communication and dissemination strategy for UNITY-6G serves as a strategic framework designed to maximize the project's visibility and long-term impact. This approach defines the methodologies and tools that guide the consortium in effectively sharing advancements, fostering collaborations, and ensuring the uptake of project results across industry, academia, and policy stakeholders. Throughout the first 18 months (M1–M18), the strategy has focused on establishing a strong foundation for impact creation, ensuring consistency and alignment across all project partners.

The implementation of this strategy is centered on the following core methodologies:

- **Phased impact creation**: The consortium followed a structured three-stage evolution, with the M1–M18 period covering Stage 1 (Awareness Creation and Strategic Planning) and the transition into Stage 2 (Community Engagement and Initial Results Dissemination).
- **Stakeholder-driven outreach**: Outreach activities are guided by an initial stakeholder mapping exercise that categorizes target groups, such as researchers, industrial players, and standardization bodies, based on their level of influence and interest in the project. This mapping allows the consortium to prioritize engagement efforts and tailor communication strategies to ensure the right messages reach the appropriate audiences.
- **Visual coherence and consistency**: To reinforce credibility and professionalism, the project established a cohesive visual identity at the outset, including a defined color palette, logo variations, and standardized templates for various outputs. Under the guidance of the WP7 leader from Martel (MAR), these elements are consistently applied by all partners to ensure project recognition across all communication channels.
- **Open science and transparency**: UNITY-6G adheres to the principles of open science, ensuring that research findings and publications are openly accessible via the project website and the Zenodo repository. This approach balances transparency with the need to protect intellectual property and sensitive information.
- **Strategic collaboration**: The strategy leverages the existing networks of consortium members to establish liaisons with related initiatives to maximize outreach through joint dissemination efforts and knowledge exchange.
- **KPI-based monitoring**: All outreach and impact-creation efforts are continuously monitored and evaluated against a set of established Key Performance Indicators (KPIs), ensuring the effectiveness of the communication tools and channels used.

By establishing this robust framework early in the project, UNITY-6G has ensured that its communication and dissemination activities are coherent, consistent, and fully aligned with its overarching mission of pioneering sustainable and scalable 6G architectures.

2.2 COMMUNICATION AND DISSEMINATION OBJECTIVES

The communication and dissemination activities conducted during the first 18 months (M1–M18) were guided by a set of objectives aimed at increasing the visibility, reach, and impact of the project. Progress towards these objectives is summarized below.

- **Establish strong digital presence**: One of the key objectives was to create and maintain effective digital communication channels to support project outreach and stakeholder interaction. This objective was successfully achieved through the launch and continuous promotion of the project website and UNITY-6G LinkedIn, which exceeded the initial targets in terms of traffic and follower base.
- **Increase project visibility and awareness within the 6G ecosystem:** The consortium aimed to position UNITY-6G as a trusted and well-recognized initiative within the international 6G landscape. This objective was achieved through active participation in major industry and scientific events, including MWC, EuCNC & 6G Summit, and several IEEE conferences, where project objectives, progress, and early results were presented to relevant audiences.
- **Disseminate scientific and technical results**: The consortium sought to ensure the timely dissemination of research outcomes through high-quality scientific and technical venues. By project midterm, UNITY-6G had published 52 publications in leading journals and conferences, including the IEEE Open Journal of the Communications Society, IEEE Communications Standards Magazine, and IEEE Network, significantly enhancing the project's visibility and impact.
- **Engage relevant stakeholder communities**: Another objective was to establish meaningful interactions with stakeholders from academia, industry, and the broader 6G community. Through targeted dissemination activities, participation in events, and collaboration with related initiatives, the consortium expanded its network and strengthened the visibility of project activities and results.
- **Ensure accessibility of project outputs**: In line with Horizon Europe requirements and the project's commitment to open science, publications and dissemination materials have been systematically made available through the project website and the Zenodo repository, supporting transparency, accessibility, and long-term availability of project outputs.

Overall, the communication and dissemination objectives defined for the M1–M18 period have been successfully achieved. The consortium has established a solid foundation for broader outreach and stakeholder engagement, positioning UNITY-6G for intensified dissemination activities during the second half of the project.

2.3 COMMUNICATION AND DISSEMINATION TOOLS AND CHANNELS

2.3.1 Visual identity

To ensure UNITY-6G is easily recognizable and maintains a professional image, a cohesive visual identity was established at the project's outset. This identity serves as the foundation for

all communication and dissemination materials, reinforcing the project's credibility across diverse channels.

The deployment of the UNITY-6G visual identity (shown in Figure 1) has focused on the following key assets:

- **Logo and iconography**: The primary UNITY-6G logo and its variations have been consistently applied to all materials.
- **Color palette**: The defined color scheme has been utilized across the website, social media graphics, and event materials to maintain a distinct brand presence.
- **Branded templates**: Standardized templates for PowerPoint presentations, press releases, posters, and deliverables were distributed to all partners.
- **Typography**: The project has maintained a professional appearance by adhering to established typography styles that prioritize readability and consistency in all digital and printed outputs.

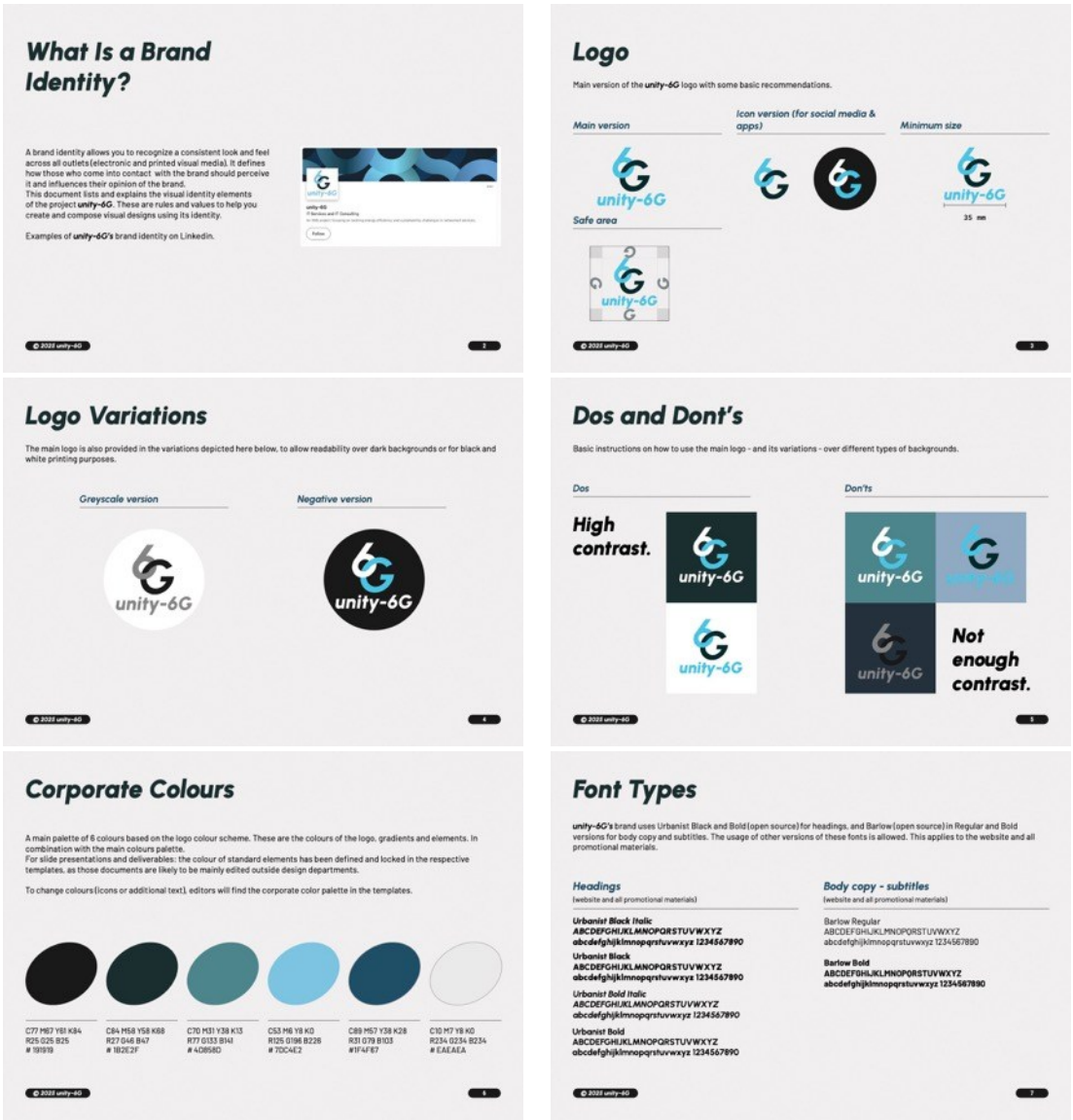


Figure 1: UNITY-6G brand guidelines

The use of these assets has been monitored by the WP7 leader (MAR). All produced materials, including the project roll-up, brochure, one-pager with QR code, and architectural and use cases visuals, have successfully integrated these elements, strengthening project recognition within the 6G ecosystem. This consistent application has been vital in fostering a sense of alignment and active participation from all consortium members.

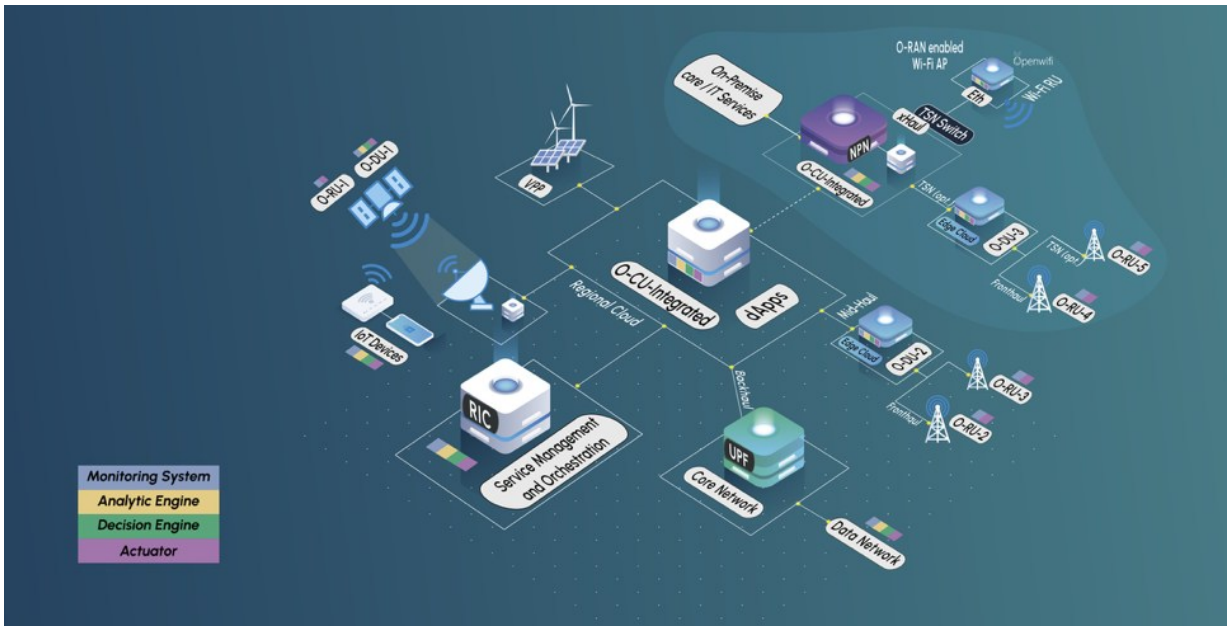


Figure 2: UNITY-6G architecture graphic

Figure 3: One-pager with QR code (left) and bookmark, front and back (right)

2.3.2 Website

The UNITY-6G website (unity-6g.eu) serves as a key reference point and central repository for all project-related content. It is designed to be the main hub for stakeholders to access the latest news, results, and resources, ensuring that the project's visibility is maintained throughout its lifecycle and beyond (the website will remain online after the project's

conclusion). Launched in M1, the platform has evolved alongside the project to reflect its maturing technical and dissemination outputs.

Figure 4: UNITY-6G website – responsive views

The website provides a comprehensive and structured overview of the project through a wide range of dedicated sections and pages:

- **ABOUT**
  - Background and Scope – Overview of the project objectives, challenges, and technological vision.
  - UNITY-6G Architecture – Description of the project architecture, including its key components and design principles, complemented by a bespoke graphic.
  - UNITY-6G Use Cases – Four dedicated pages presenting UNITY-6G use cases, each complemented by a bespoke visual.
  - Consortium – Information about the consortium and the project leadership team.
- **NEWS**
  - **News Articles** – Regularly populated page featuring project news and announcements, organized into categories to facilitate navigation and searchability.
  - **Newsletter** – Subscription portal and archive of released newsletter editions.
  - **Press Releases** – PDF versions of official press releases issued by the project.
  - **Press Clippings** – Curated collection of external media coverage and references to UNITY-6G across online, professional, and technical publications.
- **EVENTS** – Overview of upcoming project-related events.
- **LIBRARY**
  - **Deliverables** – Repository of non-sensitive project deliverables.
  - **Papers** – Collection of peer-reviewed publications produced within the project.
  - **Datasets** – Collection of non-sensitive research datasets generated by the project consortium.

- **Contributions to SDOs** – Overview of the project's contributions to standardization activities.
- **Videos** – Multimedia repository featuring project videos, including interviews, explainers, and demos.
- **Promotional Materials** – Downloadable promotional assets, including brochures, posters, and roll-ups.

This structured organization ensures that different stakeholder groups—including researchers, industry representatives, policymakers, and the wider public—can easily access the information most relevant to their interests.

To keep the community informed and engaged, the website is continuously updated to reflect project evolution. During the reporting period, content across the website was regularly expanded and updated, with particular emphasis on:

- **News articles**: Over 80 news articles were published on the project website during the reporting period, providing a chronological narrative of the project's activities and milestones. To facilitate searchability, news articles are categorized (as shown in Figure 5).

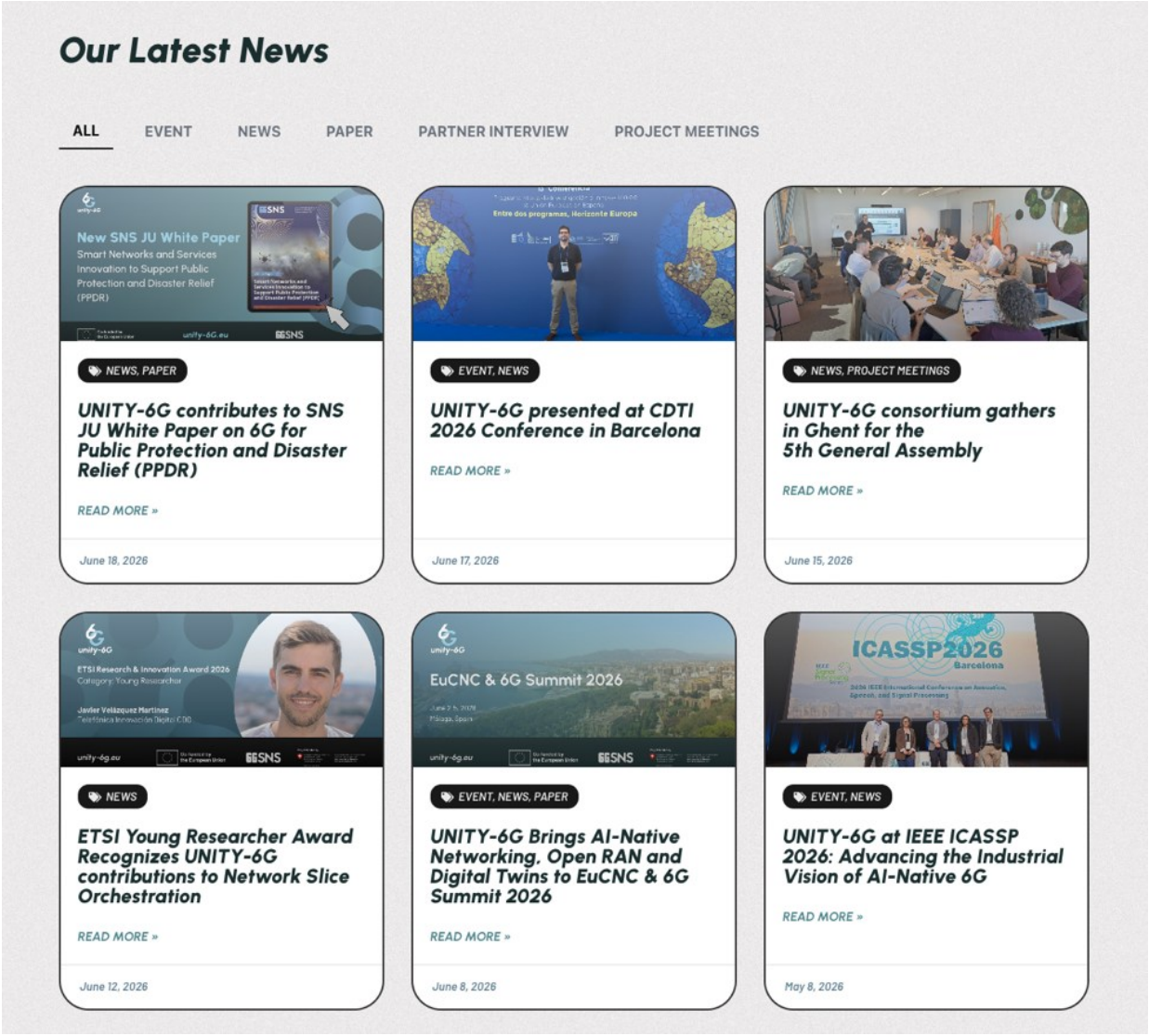


Figure 5: UNITY-6G news section

- **Promotional and multimedia assets**: The project website hosts the full suite of videos (including the "UNITY-6G Overview," "In a Nutshell" animated explainer, and demo videos), as well as downloadable versions of promotional and supporting materials, such as the project brochure, roll-up, and the bespoke architecture graphic (presented in Figure 2).
- **Deliverables**: Public deliverables are made available for download upon their submission to the EC, serving as a transparent record of the project's progress. Note: Except where IP protection requires a temporary embargo.

The website utilizes Matomo analytics, which provides the consortium with detailed insights into visitor engagement and content effectiveness while remaining fully compliant with GDPR regulations. This data allows the WP7 leader to refine communication tactics based on which resources attract the most interest.

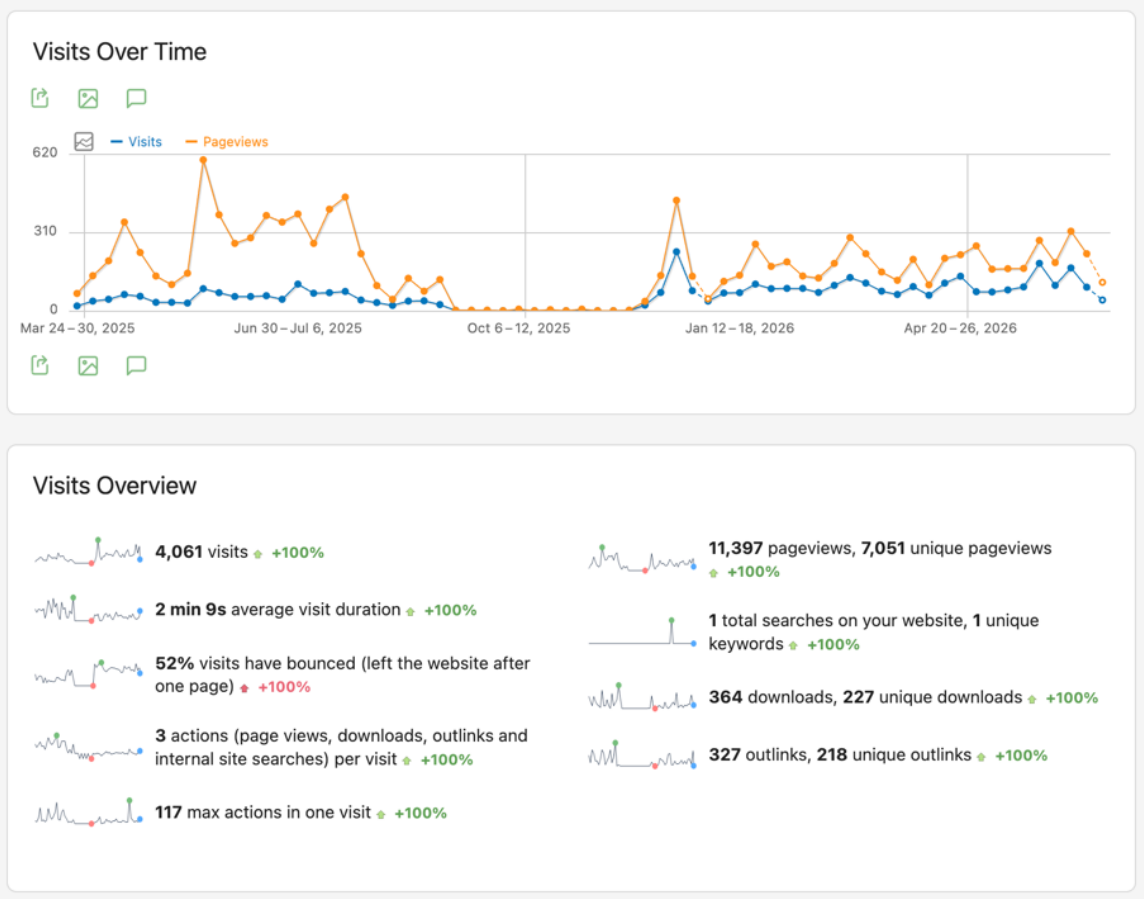
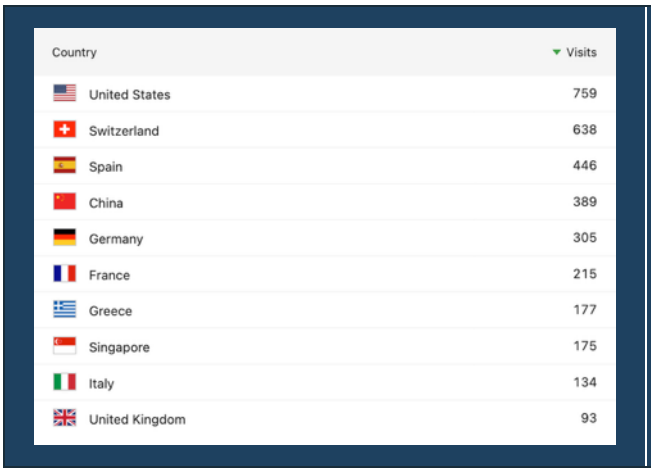


Figure 6: UNITY-6G project website – visitor analytics (M1-M18)

As shown in Figure 6, during the first 18 months of the project, the UNITY-6G website has shown steady growth in both visibility and user engagement, reaching **4,061 visits** and attracting visitors from across Europe and beyond. Traffic peaks were closely linked to major dissemination activities, including conference participation, publication announcements, and project news, demonstrating the positive impact of coordinated communication efforts. At the same time, visitor behavior suggests sustained interest not only in general project information but also in technical content, with users frequently exploring sections related to the project's scope, consortium, architecture, deliverables and scientific publications. As a result, the website has successfully established itself as the central entry point for project information and

a key channel for disseminating UNITY-6G activities, achievements and research outcomes to a broad range of stakeholders.



Country	Visits
United States	759
Switzerland	638
Spain	446
China	389
Germany	305
France	215
Greece	177
Singapore	175
Italy	134
United Kingdom	93

Figure 7: Top countries website visitors

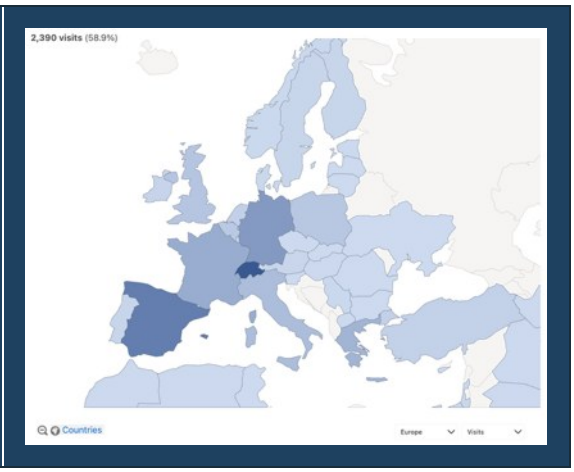


Figure 8: Geographic distribution of European website visitors (2,390 visits during M1-M18)

2.3.3 Newsletter

The UNITY-6G e-newsletter serves as a key channel for communicating project progress, research achievements and upcoming activities to external stakeholders. During the first reporting period, **2 newsletter issues** (the 3rd is planned for June 30, 2026) were published, covering major project developments, scientific publications, event participation, technical achievements and consortium news. Both newsletters are available on the website[3]. By M18, the newsletter had reached **103 active subscribers**, achieving the project's target for this period. Engagement levels were strong, with open rates of 50% and 58.3%, and click rates of 23.1% and 14.6% respectively demonstrating sustained interest in project activities and results.

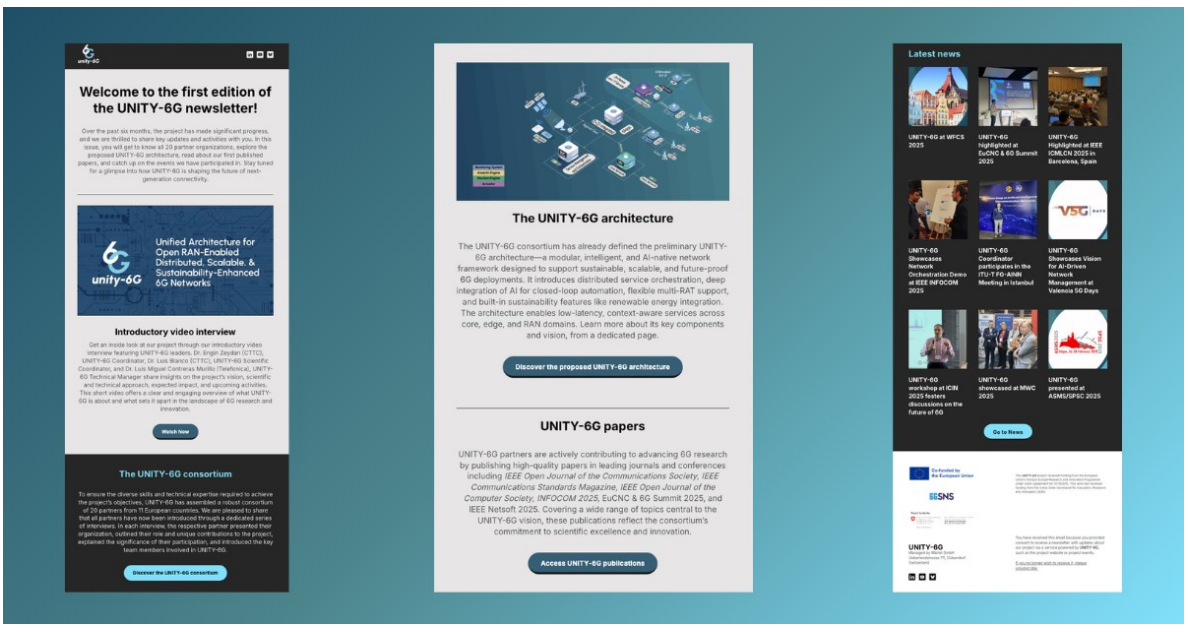


Figure 9: Example UNITY-6G Newsletter - 1st Issue (June 2025)

[3] https://unity-6g.eu/newsletter/

2.3.4 Social media channels

During the first 18 months of the project, UNITY-6G steadily expanded its social media presence and established social platforms as an important channel for communicating project developments to the wider research and innovation community. Regular updates covering publications, conference participation, technical achievements, demonstrations, and project meetings helped maintain a consistent online presence throughout the reporting period.

LinkedIn remained the project's primary social media channel, reaching **513 followers** by M18 (as of June 25, 2026). Available analytics for the most recent 12-month period indicate strong performance, generating more than 37,500 impressions and achieving an average engagement rate of approximately 15%, reflecting sustained audience interest and interaction with project content. The platform successfully reached its intended stakeholder groups, particularly researchers, engineers, and technology professionals. In parallel, to maximize outreach efficiency, the project established a presence on Bluesky, hoping to provide an additional channel for sharing project news and updates. However, while promising for general public discourse, the platform currently lacks the necessary institutional infrastructure, robust native analytical tools, and targeted professional stakeholder groups required to effectively support an EC dissemination strategy at this project stage.

Overall, social media activities contributed to increasing the visibility of project results, broadening stakeholder reach and strengthening UNITY-6G's presence within the European 6G research and innovation ecosystem.

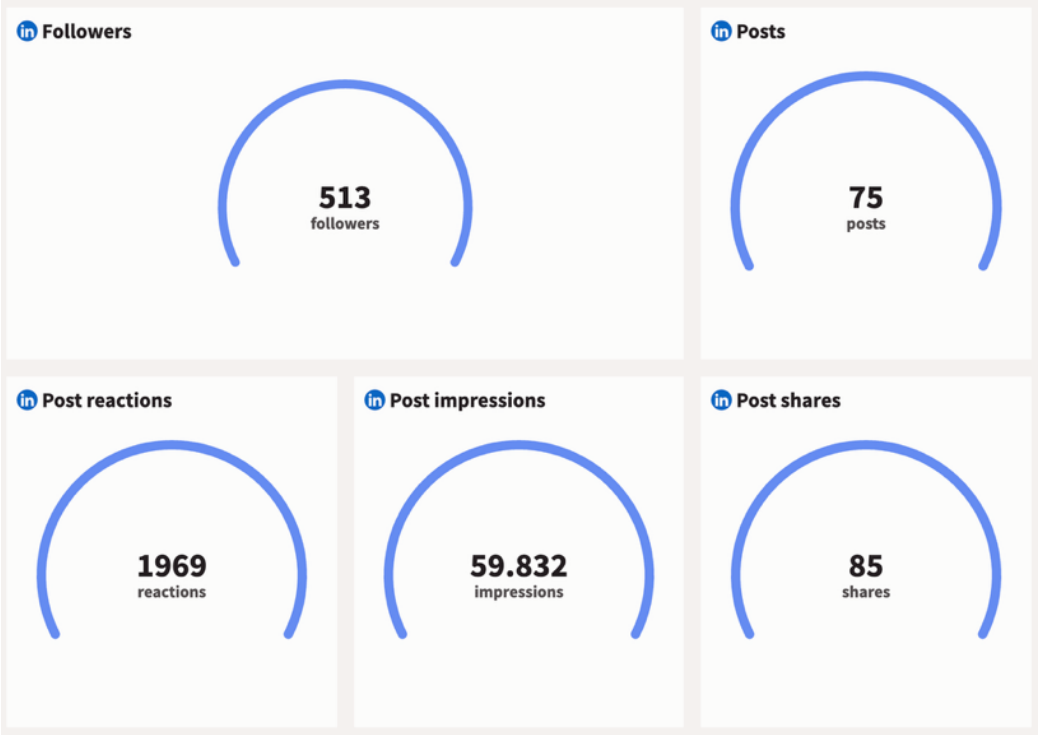


Figure 10: Hootsuite analytics for the UNITY-6G LinkedIn page

2.3.4.1 YouTube

Video content has complemented the project's dissemination activities by providing accessible and engaging formats for presenting project concepts, technical developments, and demonstration results. During the reporting period, the UNITY-6G YouTube channel hosted

project overview videos, technical demonstrations and event-related content, accumulating **364 views** with **14.5 hours of watch time.**

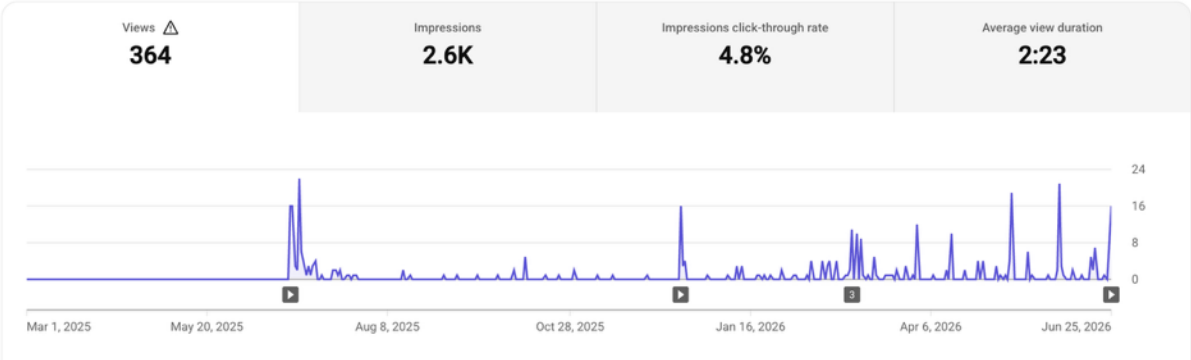


Figure 11: Viewer analytics for the UNITY-6G YouTube channel

The most viewed videos included the project overview and introductory materials, alongside demonstrations showcasing technical innovations developed within the project. Viewer traffic was primarily generated through external sources and dissemination activities conducted via the project's website, newsletters, and social media channels. These results demonstrate the value of video-based communication in supporting the dissemination of project outcomes and increasing the accessibility of complex technical topics to diverse stakeholder audiences.

2.3.5 Events

To maximize project visibility, foster collaboration, and influence standardization, the consortium actively attends and co-organizes high-profile, international events, which involves presenting technical papers, participating in panels, and conducting live demonstrations of the core UNITY-6G innovations. To date, the consortium attended over 50 events (e.g., different editions of MWC and EuCNC & 6G Summit, and several IEEE events, e.g., PIMRC) and (co) organized 16 (e.g., Special session "AURA-6G: Towards an AI-native, service-oriented, ubiquitous and verifiable 6G integrated fabric", Workshop “Integrated 6G Architectures and Technologies for Terrestrial and Non-Terrestrial Networks”). The full list of attended and (co)organized events is presented in the next pages.

Figure 12: Photos of selected dissemination activities (ICASSP 2026, ETSI SNS4SNS 2026, NTN, Security & Resilience 2025, IEEE ICDCS 2025, EuCNC & 6G Summit 2025)

Table 1: Full list of attended and (co)organized events by UNITY-6G

#	Event	Date & Location	Partner(s) Involved	Type of Activity	Contribution
1	KTH Seminar	20 February 2025, Kista, Sweden	CTTC	Invited seminar	AI-native and sustainable 6G infrastructure
2	O-RAN face-to-face meeting	24-27 February 2025, Paris, France	TID	Standards engagement	Operational closed-loop lifecycle for TNM
3	Advanced Satellite Multimedia Systems Conference and Signal Processing for Space Communications Workshop 2025	26–28 February 2025, Sitges, Spain	DLR, CTTC, UNIBO	Scientific conference and Special session/Panel	NTN integration and sustainable 6G architectures
4	Mobile World Congress 2025	3–6 March 2025, Barcelona, Spain	several consortium partners	Booth presence, demos, networking	CAMARA Edge Discovery demo; early dissemination of UNITY-6G architecture and innovations
5	International Conference on Information Networking 2025	9–11 March 2025, Paris, France	CTTC	Workshop co-organization	2nd Workshop on 6G Network Use Cases and Verticals; AI/ML, O-RAN, 6G architectures
6	Valencia 5G Days	27–28 March 2025, Valencia, Spain	CTTC	Invited talk and panel	AI-driven network management and automation
7	MEC Congress 2025	31 March 2025, Rotterdam, Netherlands	FDI	Paper presentation	Energy-efficient MEC-enabled O-RAN scheduling
8	ITU-T Focus Group on Autonomous Intelligent	14–15 April 2025, Istanbul, Türkiye	CTTC	Standards engagement	AI-native disaster handling use case

	Networks and Network Automation – 2nd Meeting				
9	Wireless Community Event	April 2025, Leuven, Belgium	imec	Industrial engagement	Wireless TSN research infrastructure
10	IEEE Smart Internet of Things Conference 2025	May 2025, Sydney, Australia	HES-SO	Paper presentation	Energy-optimal load shifting strategies
11	IEEE 802 Wireless Interim Session 2025	11–16 May 2025, Warsaw, Poland	imec	Standards participation	openwifi and sub-20MHz co-OFDMA
12	IEEE International Conference on Computer Communications 2025	19–22 May 2025, London, United Kingdom	CTTC	Technical demonstration	Cloud-native mobile core, slicing, 3GPP Split 7.2
13	ETSI TeraFlowSDN Hackfest #7	19–22 May 2025, Castelldefels, Spain	TID	Tutorial and live demo	Network Slice Controller integration with ETSI TeraFlowSDN
14	IEEE International Conference on Machine Learning for Communication and Networking 2025	26–29 May 2025, Barcelona, Spain	NBC	Booth and poster	AI-driven cloud-edge workload prediction and orchestration
15	European Conference on Networks and Communications & 6G Summit 2025	3–6 June 2025, Poznań, Poland	CTTC, KEY, MAR, Rimedo Labs, SRS, imec, TID	Booth, demos, papers, workshops, special sessions	Posters, demos, orchestration, AI-native 6G, Open RAN, transport orchestration
16	Mediterranean Communication and Computer Networking Conference 2025	June 2025, Cagliari, Italy	HES-SO	Paper presentation	Ground vehicles as moving urban base stations

17	IEEE Workshop on Factory Communication Systems 2025	10–13 June 2025, Rostock, Germany	Nokia, imec	Special session, tutorial, demo	Wi-Fi 7/8, LiFi, W-TSN, deterministic wireless networking
18	IEEE Conference on Network Softwarization 2025	23–27 June 2025, Budapest, Hungary	CTTC, SRS, TID	Demonstration	Cloud-native deployment of RAN/Core/Transport with slicing
19	ITU-T Focus Group on Autonomous Intelligent Networks and Network Automation – 4th Meeting	11 July 2025, Geneva, Switzerland	CTTC	Standards engagement	AI-native 6G architecture discussions
20	IEEE International Conference on Cyber Security and Resilience 2025	04-06 August 2025, Chania, Crete, Greece	CTTC	Tutorial	Data engineering, federated learning, blockchain for B5G/6G
21	IEEE International Conference on Distributed Computing Systems 2025	20–23 July 2025, Glasgow, United Kingdom	CTTC	Tutorial	Data engineering and blockchain for B5G/6G networks
22	IEEE International Symposium on Personal, Indoor and Mobile Radio Communications 2025	7–10 September 2025, Istanbul, Türkiye	CTTC, DLR, UNIBO	Workshop co-organization	TN-NTN integration and seamless 6G architectures
23	ELIXIRION Schools 3 & 4	15 September 2025, Barcelona, Spain	CTTC	Technical lectures	O-RAN NTN, data engineering, KANs for 6G
24	Expert Forum on NTN, Security and Resilience	September 19, 2025, Oberpfaffenhofen, Germany	DLR	Expert forum	Security-by-design and resilient TN-NTN integration

25	Time-Sensitive Networking and Applications Conference 2025	23–24 September 2025, Stuttgart, Germany	imec	Presentation and demo	Deterministic Wi-Fi and W-TSN
26	International Conference on Blockchain Computing and Applications 2025	October 2025, Dubrovnik, Croatia	CTTC, external collaborators	Tutorial	Blockchain and orchestration for B5G/6G
27	COST INTERACT Management Committee Meeting	October 2025, Lille, France	HES-SO	Technical presentation	Energy-efficient network sharing for 6G
28	ACM International Conference on Modeling, Analysis and Simulation of Wireless and Mobile Systems 2025	October 2025, Barcelona, Spain	HES-SO	Conference co-organization and paper	Hybrid network sharing strategies for energy-efficient systems
29	NetworkX, workshop “AI for Networks and Networks for AI - The ETSI Software approach”	14-16 October 2025, Paris, France	TID	Technical presentation	The role of TeraFlowSDN for controlling networks in the AI evolution
30	IEEE International Conference on Wireless and Mobile Computing, Networking and Communications	20-22 October 2025, Marrakech, Morocco	CTTC	Paper presentation	Design and Evaluation of orchestrated E2E cloud-native mobile network
31	OpenSlice Plenary Meeting #7	23 October 2025, Lisbon, Portugal	TID	Plenary participation	OpenSlice orchestration synergies
32	ETSI TeraFlowSDN Hackfest #8	18–21 November 2025, Online	TID	Tutorial and training	Network Slice Controller updates and onboarding

33	IEEE Conference on Communications and Networking 2025	3–5 December 2025, Rabat, Morocco	imec	Paper presentation	Distributed MLO for wireless TSN
34	Italian Networking Workshop 2026	12–14 January 2026, Aosta, Italy	HES-SO	Technical presentations	Intelligent and distributed 6G networking
35	one6G Open Lecture 11	22 January 2026, Online	Several consortium partners	Webinar / lecture	NTN convergence and satellite-edge integration
36	ETSI SNS4SNS 2026	2–5 February 2026, Sophia Antipolis, France	Several consortium partners	Demos and posters	Cloud-native orchestration, trustworthy FL, agentic AI
37	O-RAN face-to-face meeting	2-6 February 2026, Rome, Italy	TID	Standards engagement	UNITY-6G project topics related to O-RAN nGRG
38	ETSI AI and Data Conference	9–11 February 2026, Sophia Antipolis, France	CTTC	Poster presentation	Semantic communications for NTN
39	Mobile World Congress 2026	2–5 March 2026, Barcelona, Spain	Several consortium partners	Booth, demos, networking	Multi-domain orchestration, FL trust, agentic AI automation
40	International Conference on Wireless On-demand Network Systems and Services 2026	2–4 March 2026, Crans-Montana, Switzerland	HES-SO	Conference participation	AI-native and service-oriented 6G networking
41	IEEE International Conference on Industrial Technology 2026	4–6 March 2026, Monterrey, Mexico	Several consortium partners	Tutorial	Quantum-resilient security for industrial 6G

42	125th gathering of the Internet Engineering Task Force (IETF #125)	14-20 March 2026, Shenzhen, China	TID	Standards engagement	5QI to DiffServ DSCP Mapping Example for Enforcement of 5G End-to-End Network Slice QoS
43	DEWICOMM 2026	24–25 March 2026, Dresden, Germany	imec	Workshop participation	W-TSN and deterministic wireless communications
44	International Conference on Information Networking 2026	30 March–2 April 2026, Athens, Greece	Several consortium partners	Technical participation	Cloud-native and AI-driven 6G architectures
45	IEEE International Workshop on Factory Communication Systems 2026	21–24 April 2026, Offenburg, Germany	imec	Technical presentation	O-RAN-compatible IEEE 802.11 APs
46	IEEE International Conference on Acoustics, Speech, and Signal Processing 2026	4–8 May 2026, Barcelona, Spain	Several consortium partners	Panel on unification of architecture	AI-native, distributed, and sustainable 6G
47	IEEE 802 Wireless Interim Session 2026	10–15 May 2026, Antwerp, Belgium	imec	Technical presentation	Wireless TSN for Wi-Fi 9
48	International Conference on Telecommunications 2026 (ICT 2026)	20-22 May 2026, Thessaloniki, Greece	CTTC	Presentation on Semantic Communications	A Service-Based Management Architecture for Intelligent Cross-Domain Orchestration in 6G Networks
49	IEEE/IFIP Network Operations and Management Symposium 2026	18–22 May 2026, Rome, Italy	CTTC, TID	Demo and industrial panels	O-RAN orchestration, trust and AI-native infrastructuresand Next Steps of Industrial Communications and Networks
50	European Conference on Networks and Communications & 6G Summit 2026	2–5 June 2026, Málaga, Spain	CTTC, imec, TID, SRS, KEY, MAR, NBC, DLR,	Booth, workshops, demos, papers	AI-native networking, NTN, NDTs, orchestration, slicing, O-RAN

			PUT, HES-SO, FDI		
51	IEEE Vehicular Technology Conference Spring 2026	9–12 June 2026, Nice, France	FDI	Paper presentation	AI-driven and programmable wireless architectures
52	IEEE Conference on Network Softwarization 2026	29 June–3 July 2026, Berlin, Germany	CTTC	Demonstration	Integration of TN-NTN within O-RAN
53	13th Conference of the EU Research and Innovation Framework Programme in Spain	June 16, 2026, Barcelona, Spain	CTTC	Poster display	AI-native and sustainable 6G infrastructure

2.3.6 Videos

The UNITY-6G project leverages video content as a dynamic outreach tool to simplify complex technical concepts and showcase the project's evolution to both technical and non-technical audiences. Throughout the first 18 months, the consortium has produced eight videos, including a strategic interview with project leaders, an animated explainer, and six technical demonstration videos. More details about each video can be found in Table 2.

Table 2: Overview of video content produced by UNITY-6G

Video title and release date	Type	Focus	Key topics	Dissemination purpose
UNITY-6G Overview June 2025	Project overview video	Introductory interview-based project overview presenting the project vision, ambitions, and expected impact	AI-native 6G, Open RAN, distributed infrastructures, sustainable networking	Introduce UNITY-6G objectives, architecture, and innovation vision to broad stakeholder audiences
UNITY-6G in a nutshell December 2025	Animated explainer	Talks about how UNITY-6G addresses the energy consumption of digital technologies through greener and more intelligent mobile network design	AI-driven optimization, distributed ledger technologies, XR, Digital Twins, Industry 4.0	Disseminate sustainability-oriented innovations and AI-native orchestration concepts
5G Cloud-Native Network Multi-Domain Orchestration Demo March 2026 (MWC 2026)	Demo video	Showcases a full end-to-end distributed 5G mobile network spanning RAN to Core with cloud-native orchestration	Open5GS, srsRAN, O-RAN Split 7.2, TeraFlowSDN, network slicing, orchestration	Demonstrate practical implementation of cloud-native orchestration and multi-domain automation
FL-DApp: Decentralized Application for Reputation-Based Federated Learning March 2026 (MWC 2026)	Demo video	Presents a blockchain-enabled reputation mechanism for trustworthy federated learning in collaborative AI systems	Federated Learning, blockchain, DApps, Polygon Layer-2, smart contracts	Showcase trustworthy AI training, reputation management, and decentralized automation
Agentic Edge Demo March 2026 (MWC 2026)	Demo video	Demonstrates a multi-agent orchestration framework translating high-level operator	Agentic AI, orchestration, autonomous networking,	Illustrate AI-driven autonomous network lifecycle management and

		intents into automated network actions	energy-aware optimization	intelligent orchestration
O-RAN compliant Wi-Fi Access Points for Programmable and Intelligent Multi-RAT Networks June 2026 (EuCNC & 6G Summit)	Demo video	Showcases an O-RAN compliant OpenWiFi Access Point utilizing a standardized E2 interface to stream live telemetry and receive real-time control commands from a Near-RT RIC	Multi-RAT networks, O-RAN E2 interface, OpenWiFi, Near-RT RIC, xApps, industrial IoT	Demonstrate the architectural feasibility of extending O-RAN management to non-3GPP technologies for a unified control plane
From Data to Action - Agentic AI for Proactive CNF Orchestration in 6G Networks June 2026 (EuCNC & 6G Summit)	Demo video	Showcase CFE: a multi-agent AI pipeline that turns CNF telemetry into proactive orchestration decisions: from statistical analysis through model selection to resource reconfiguration	Multi-agent AI, orchestration, A2A protocol, time-series forecasting	Demonstrate agentic AI approach to proactive CNF resource management, end-to-end pipeline from raw telemetry to concrete orchestration decisions
Multi-domain service deployment and termination: hardware demo	Demo video	Showcase the hardware realization of the dynamic service deployment and termination	Service lifecyle, inter domain management and orchestration (IDMO), hardware experiments	Demonstrate the ability of real time and real-life establishment of the Core and RAN network, reinitialize the network after an accident, and terminate when no longer needed.

The performance of the videos is monitored via YouTube Analytics to evaluate engagement and reach across the stakeholder community. As of June 26, 2026, the cumulative viewership of the UNITY-6G videos is 364.

2.3.7 Produced supporting materials

To effectively showcase the project and its achievements at various events, UNITY-6G has developed a comprehensive suite of promotional materials. These assets are tailored in style and messaging to suit specific target audiences, ensuring that the project's complex technical concepts are accessible to industry, academia, and policy stakeholders.

The following materials were produced during the first 18 months of the project:

- **Bespoke digital graphics**: The consortium created high-quality visual assets, including a detailed graphic of the UNITY-6G architecture (Figure 2) and four dedicated graphics representing each of the project's use cases.

- **Roll-up and project poster**: Designed for use at international conferences and exhibitions, these materials (Figure 13) prominently feature the UNITY-6G architecture to facilitate technical discussions and enhance visibility at partner booths.

Figure 13: Event roll-up (left) and posters (middle and right)

- **Bookmark (small flyer)**: In an effort to maximize the likelihood of stakeholder retention, the project developed a small flyer in a bookmark format. This practical asset highlights the four project use cases and includes a QR code for quick access to the project website (Figure 3).
- **Comprehensive brochure**: A more detailed brochure was developed to provide a deeper dive into the project's framework. This brochure features sections dedicated to the project overview, the UNITY-6G use cases, key innovations, and the expected impact.
- **Exhibition booth walls**: Eye-catching booth wall prints were developed to support project promotion and demonstrations at the EuCNC &6G Summit 2026 (Figure 14).

Figure 14: Exhibition booth wall print at EuCNC & 6G Summit 2026

All supporting materials strictly adhere to the established visual identity, utilizing the project's color palette and typography to ensure professional consistency across all physical and digital assets. These materials have been instrumental during major events such as MWC and EuCNC & 6G Summit, helping the consortium engage with the broader 6G community.

2.3.8 Publications

To date, the UNITY-6G consortium published 52 papers in peer-reviewed journals and conference proceedings to disseminate foundational scientific and technical results. The publications address a broad range of topics aligned with the project objectives, including Open RAN architectures, cloud-native and multi-domain orchestration, network slicing, artificial intelligence and machine learning for network management, federated learning, blockchain-enabled trust mechanisms, sustainability and energy efficiency, security orchestration, Network Digital Twins, and integrated terrestrial networks (TN) and non-terrestrial networks (NTN). Several publications also explored emerging concepts such as Agentic AI, cognitive cloud-edge-IoT continuums, semantic communications, industrial private networks, and advanced Wi-Fi technologies.

The consortium achieved strong visibility through publications in high-impact journals, including IEEE Communications Magazine, IEEE Network, IEEE Access, IEEE Communications Standards Magazine, IEEE Transactions on Network and Service Management, IEEE Transactions on Green Communications and Networking, IEEE Open Journal of the Communications Society, and IEEE Open Journal of the Computer Society. In parallel, project results were presented at major international conferences such as IEEE INFOCOM, EuCNC & 6G Summit, IEEE NetSoft, IEEE NOMS, IEEE ICC, IEEE VTC, IEEE WFCS, IEEE WiMob, IEEE SDN-NFV, and WONS.

All published papers are made available on the project website (https://unity-6g.eu/paper-and-publications) and the UNITY-6G community on Zenodo (https://zenodo.org/communities/unity-6g). The full list can also be retrieved here below.

Table 3: Overview of UNITY-6G papers available on Zenodo

#	Paper Title (with link to Zenodo)	Publication Venue	Release Date
1	Trustworthy Reputation for Federated Learning in O-RAN Using Blockchain and Smart Contracts	Journal – IEEE Open Journal of the Communications Society	February 2025
2	Green Operations of SWIPT Networks: The Role of End-User Devices	Journal – IEEE Transactions on Green Communications and Networking	March 2025
3	Addressing Security Orchestration Challenges in Next-Generation Networks: A Comprehensive Overview	Journal – IEEE Open Journal of the Computer Society	April 2025

4	Security Orchestration in 5G and Beyond Smart Network Technologies	Journal – IEEE Open Journal of the Computer Society	April 2025
5	SLEEPY-rApp: Delay-aware Sleep Scheduling for Energy Efficiency in MEC-enabled O-RAN	Conference – International Workshop on MetaOS for the Cloud-Edge-IoT Continuum	April 2025
6	End-to-End Slice Orchestration in a 5G cloud-native Mobile Network with O-RAN Split 7.2	Conference – IEEE INFOCOM 2025	May 2025
7	Probabilistic Forecasting for Network Resource Analysis in Integrated Terrestrial and Non-Terrestrial Networks	Journal – IEEE Communications Standards Magazine	May 2025
8	From 6G to SeaX-G: Integrated 6G TN/NTN for AI-Assisted Maritime Communications - Architecture, Enablers, and Optimization Problems	Journal – Journal of Marine Science and Engineering	May 2025
9	Exploiting 6G RAN and Core Network Information for Intelligent Edge-Cloud Service Orchestration	Conference – EuCNC & 6G Summit 2025	June 2025
10	Advances in Network Orchestration for Security, Scalability, and Sustainability	Conference – EuCNC & 6G Summit 2025	June 2025
11	UNITY-6G: UNified archITecture for Open RAN-Enabled Distributed, Scalable and SustainabilitY-Enhanced 6G Networks	Conference – EuCNC & 6G Summit 2025	June 2025
12	Network Resource Management for Unified 6GNetwork: The UNITY-6G Approach	Conference – EuCNC & 6G Summit 2025	June 2025
13	Full Orchestration of a Distributed 5G cloud-native Mobile Network: O-RAN, Core, and Transport	Conference – IEEE Netsoft 2025	June 2025
14	Assessing the Benefits of Ground Vehicles as Moving Urban Base Stations	Conference – Mediterranean Communication and Computer Networking 2025	June 2025
15	Blockchain for Federated Learning in the Internet of Things: Trustworthy Adaption, Standards and Road Ahead	Journal – IEEE Communications Standards Magazine	July 2025

16	COMIX: Generalized Conflict Management in O-RAN xApps - Architecture, Workflow, and a Power Control case	Journal – IEEE Access	July 2025
17	XR Streaming Performance with Wi-Fi 7 Multi-Link Operation	Journal – IEEE Open Journal of the Communications Society	August 2025
18	Semantic Non Terrestrial Communications with Open RAN-enabled 6G	Journal – IEEE Communications Standards Magazine	September 2025
19	Reducing Offshore People on Board (POB) Costs Using Dynamic AI-Driven Wireless Mesh Digital Connectivity	Conference – Rio Pipeline & Logistics 2025	September 2025
20	Modelling and Performance Analysis of Non-Primary Channel Access in Wi-Fi Networks	Journal – IEEE Open Journal of the Communications Society	September 2025
21	R-TWT in Wi-Fi 7 and Beyond: Enabling Bounded Latency, Energy Efficiency, and Reliability	Conference – IEEE International Conference on Emerging Technologies and Factory Automation	September 2025
22	Network Slicing for Industrial Automated Services	Conference – IEEE Conference on Standards for Communications and Networking	September 2025
23	Network Slicing in the IIoT Era: Architectures, Blueprints, and Tooling Ecosystem	Conference – IEEE Conference on Standards for Communications and Networking	September 2025
24	On the Architectural Split and Radio Intelligence Controller Placement in Integrated O-RAN-enabled Non-Terrestrial Networks	Journal – IEEE Open Journal of the Communications Society	October 2025
25	Design and Evaluation of an Orchestrated E2E Cloud-Native Mobile Network with O-RAN	Conference – IEEE International Conference on Wireless and Mobile Computing, Networking and Communications (WiMob) 2025	October 2025
26	Sharing is Caring: Analysis of Hybrid Network Sharing Strategies for Energy Efficient Multi-Operator Cellular Systems	Conference – 2025 International Conference on Modeling, Analysis and Simulation of Wireless and Mobile Systems (MSWiM)	October 2025

27	Moving Colorable Graphs: A Mobility-Aware Traffic Steering Framework for Congested Terrestrial–Sea–UAV Networks	Journal – Applied Sciences	October 2025
28	A Novel Architecture with Blockchain-based Identity Management for Industrial Systems	Conference – IEEE Latin-American Conference on Communications	November 2025
29	Energy-Aware Load Shifting in SWIPT-Enabled IoT Networks	Conference – IEEE SmartIoT 2025	November 2025
30	B5G Core Network Openness: A Proof of Concept Implementation of Location Reporting via Network Exposure Function	Conference – 2025 IEEE Conference on Network Function Virtualization and Software-Defined Networking (SDN-NFV)	November 2025
31	Improving Wi-Fi 8 Latency with Coordinated Spatial Reuse	Journal – IEEE Communications Standards Magazine	December 2025
32	Distributed Multi-link Operation (MLO) for Frame Replication in Wireless Time-Sensitive Networking	Conference – IEEE CommNet 2025	December 2025
33	TrustNet: Trust-based Networking	Journal – IEEE Communications Standards Magazine	December 2025
34	Cloud-Native Multivariate Probabilistic Forecasting for Next-Generation Resource Allocation in O-RAN	Journal – IEEE Access	December 2025
35	AGILE-6G: Agentic AI for Autonomous Management of 6G Network/Application Services	Journal – IEEE Network	December 2025
36	6G-Core-in-the-Loop: Enabling Service and Network Orchestration in a Cloud-Native Ecosystem	Journal – IEEE Communications Standards Magazine	February 2026
37	AI-Empowered Multivariate Probabilistic Forecasting: A Key Enabler for Sustainability in Open RAN	Journal – IEEE Transactions on Network and Service Management	March 2026
38	Energy-Aware Multi-Domain Orchestration Architecture for Sustainable 6G Networks	Conference – IEEE International Conference on Wireless On-demand Network Systems and Services (WONS) 2026	March 2026
39	FedRA: A Fully Decentralized Federated Learning Framework for	Journal – IEEE Communications Magazine	March 2026

	Robust Intelligence Sharing across O-RAN dApps		
40	Unified Multi-RAT Control for Industrial NPNs: O-RAN-Based Management of openwifi APs	Conference – IEEE WFCS 2026	April 2026
41	A Use Case Analysis for Identity Management in Industrial Systems	Conference –International Conference on Telecommunications (ICT) 2026.	May 2026
42	Automated Orchestration of O-RAN Near-RT RIC with Integrated Remote xApp Management	Conference – IEEE/IFIP Network Operations and Management Symposium (NOMS) 2026	May 2026
43	A Service-Based Management Architecture for Intelligent Cross-Domain Orchestration in 6G Networks	Conference – ICT 2026 International Conference on Telecommunications (accepted)	May 2026
44	Revocable Gateway-Centric Trust for Consumer Electronics Using Distributed Ledger Technology	Journal – IEEE Transactions on Consumer Electronics (accepted)	June 2026
45	FL-DApp: Open-Source Decentralized Application for Reputation in O-RAN Federated Learning	Journal – SoftwareX	June 2026
46	Dynamic Handover via AI-assisted Signal Quality Prediction in 6G Multi-RAT Networks	Conference – IEEE VTC 2026 (accepted)	June 2026
47	Empowering Next-Generation AI Through Cognitive Cloud-Edge-IoT Continuum: Architecture, Management, and Challenges	Conference – EuCNC 2026 (accepted)	June 2026
48	Agentic AI with Emulation-assisted Prevalidation for Edge-Cloud Service Orchestration	Conference – IEEE SECON 2026 (accepted)	June 2026
49	Advances on Unified Architecture for Open-RAN enabled Distributed and Scalable 6G Networks	Conference – IEEE EuCNC 2026 (accepted)	June 2026
50	Interoperable rApp/xApp Control over O-RAN for Mobility-aware Dynamic Spectrum Allocation	Conference – IEEE EuCNC 2026 (accepted)	June 2026
51	An Open-Source CAMARA UE Location API Implementation over	Conference – IEEE EuCNC 2026 (accepted)	June 2026

	3GPP NEF for AI-Native Crowd Assessment in 6G Networks		
52	Distributed Agentic AI Framework for Autonomous Edge-Cloud Service Orchestration	IEEE Transactions on Machine Learning in Communications and Networking (accepted)	June 2026

In addition, UNITY-6G actively contributed to several collaborative **white papers** developed within the SNS JU ecosystem. These contributions enabled the project to disseminate its expertise beyond its immediate research scope and engage with broader discussions shaping the future of 6G networks, services, and applications:

- CTTC and NCSR Demokritos contributed to the 6G IA Security WG White Paper *6G Security and Trust: Insights from European SNS Projects*. Published in January 2026, the paper synthesizes the collaborative research and technical enablers from several SNS JU projects and highlights critical evolutions in 6G security, including zero-touch automation, confidential computing, privacy awareness, and secure-by-design architectures.
- HOLO-LIGHT contributed to the SNS White Paper *6G for Media and Entertainment.* Published in December 2025, this paper examines how future 6G technologies can support immersive multimedia experiences, extended reality (XR), digital content creation and next-generation media services, while highlighting the networking capabilities required to support these emerging applications.
- DLR provided project expertise to the *SNS White Paper on Public Protection and Disaster Relief (PPDR)*, addressing the role of next-generation communication systems in supporting mission-critical services and emergency response scenarios.

Figure 15: Covers of SNS JU White Papers featuring UNITY-6G contributions

UNITY-6G contributions have also been provided to the SNS JU Journals. The UNITY-6G feature in the 2025 edition (pp. 180–181) presents the project, providing an overview of the UNITY-6G concept, architecture, and enabling technologies. It highlights the introduced innovations, outlines key use cases and scenarios, and summarizes the envisioned results of the project. A contribution has also been submitted for the 2026 SNS JU Journal edition. Building on the 2025 feature, it provides an updated view of the UNITY-6G vision and

architecture, with particular emphasis on the project's use cases, trial activities, and early results. The contribution further describes progress in AI-native network management, digital twins, sustainable network operation, and integrated terrestrial/non-terrestrial 6G infrastructures, while outlining the expected impact of UNITY-6G on future trustworthy, resilient, and energy-efficient 6G systems.

2.3.9 Datasets

In alignment with the European Commission's Open Science policy and the principle of making research data "as open as possible, as closed as necessary," UNITY-6G places significant importance on the release of high-quality, curated datasets. These datasets represent the empirical foundation of the project's technical innovations, derived from extensive simulations, testbed experiments, and proof-of-concept demonstrations conducted during the first 18 months.

By sharing these data assets, the consortium aims to foster transparency, enable the reproducibility of our scientific results, and provide the global 6G research community with the raw material needed to train and validate next-generation AI/ML models. All datasets are systematically deposited in the UNITY-6G Zenodo community, ensuring they are assigned persistent Digital Object Identifiers (DOIs) for long-term accessibility and proper academic citation.

The following table provides an overview of the datasets released or prepared during the reporting period.

Table 4: Overview of datasets available on Zenodo

Dataset Title (with link to Zenodo)	Lead Partner	Technical Context
5G NR End-to-End Latency Simulation Dataset	PUT	Supporting research in intelligent network orchestration and resource management by providing simulation-based measurements of end-to-end latency in 5G NR environments under diverse network conditions.
Multi-link operation data set at 2.4 GHz and 5 GHz.	IMEC	Supporting research on multi-RAT connectivity, deterministic wireless communications, and intelligent resource management by evaluating the performance of Wi-Fi multi-link operation (MLO) under varying interference and traffic load conditions.

2.4 LIAISONS AND COLLABORATION WITH RELATED INITIATIVES

UNITY-6G is committed to maximizing outreach and impact through leveraging existing networks and partnerships of its members, establishing close coordination with various related projects, industry forums, and international associations. These collaborations facilitate

knowledge exchange, promote best practices, and ensure the project's contributions are effectively integrated into the broader 6G ecosystem.

During the first 18 months of the project, UNITY-6G actively pursued collaboration with related SNS JU initiatives and key industry organizations to maximize synergies, promote knowledge exchange, and increase the impact of project results. Particular emphasis was placed on collaboration with the SNS JU projects 6G-NTN and 5G-STARDUST, which shared several consortium members with UNITY-6G, including CTTC, DLR, Orange, Hispasat, SRS, MAR and UNIBO. These overlaps facilitated regular exchanges of technical expertise, alignment of research activities, and the mutual exploitation of project outcomes in areas such as Open RAN, NTN, cloud-native architectures, and network orchestration.

The collaboration resulted in several joint dissemination and knowledge-sharing activities. Notably, UNITY-6G, 6G-NTN and 5G-STARDUST co-organized a technical workshop on integrated 6G architectures at IEEE PIMRC 2025 in Istanbul, providing a platform for presenting research results and fostering technical dialogue within the SNS JU community. In addition, project partners contributed to the development of the *6G for Media and Entertainment* White Paper and collaborated on a joint scientific publication entitled *"On the Architectural Split and Radio Intelligence Controller Placement in Integrated O-RAN-Enabled Non-Terrestrial Networks"*, published in the IEEE Open Journal of the Communications Society. The paper presents a taxonomy of architectural and functional split strategies for integrated O-RAN-enabled terrestrial and non-terrestrial network systems and exemplifies the close technical cooperation established between UNITY-6G and 5G-STARDUST researchers.

Beyond collaboration with research projects, the consortium actively engaged with relevant industry alliances and standardization ecosystems, including the one6G Association, the Utility Broadband Alliance (UBBA), and the O-RAN Alliance. These interactions provided opportunities to disseminate project results, gather feedback from industry stakeholders, and promote UNITY-6G's vision for unified, scalable and sustainability-enhanced 6G network architectures.

2.5 PARTNER-LED OUTREACH: SUMMARY OF INDIVIDUAL PARTNER CONTRIBUTIONS TO COMMUNICATION AND DISSEMINATION

In addition to collective communication and dissemination efforts, UNITY-6G partners actively leverage their institutional networks to maximize project visibility. This section outlines the individual contributions, summarizing the distinct efforts of project partners, and highlighting how they have amplified the project's visibility.

Telecommunications Technology Centre of Catalonia (CTTC): Dr. Engin Zeydan, as project coordinator, has a prominent role in the communication and dissemination of UNITY-6G. Project objectives and initial results were promoted at industry and research exhibitions like CTTC booth at Mobile World Congress (MWC) 2025 and 2026. CTTC also lead UNITY-6G presentations at the 2025 and 2026 EuCNC & 6G Summit editions. CTTC participated in panels (Valencia 5G Day), provided tutorials on subjects linked to UNITY-6G (BCCA2025, IEEE WFCS2025, etc.), participated in schools (ELIXIRON2025) and provided UNITY-6G overview presentations (KTH, SNS).

NOKIA (Germany): Dr. Gianluca Fontanesi, a key contributor at Nokia Bell Labs Germany, has contributed to advancing the communication and dissemination of UNITY-6G. His efforts include the development and presentation of a conference paper at MEDITCOM 2026, which highlights some of the techniques developed within the project. Additionally, he is set to attend MEDITCOM 2026 as an invited panelist, where he will discuss the main outcomes of his contributions across various work packages to UNITY-6G in a panel entitled “Towards a Unified Architecture for Open RAN-enabled 6G Networks.” Internally, Dr. Fontanesi has actively contributed to disseminating knowledge about Unity 6G within Nokia, fostering collaboration and ensuring alignment across teams to drive the project's strategic objectives.

Software Radio Systems (SRS): SRS has contributed to the dissemination of relevant news about the project, leveraging the large reach of its social media channels (e.g., LinkedIn). SRS has also shared information about the project's outputs in company presentations with prospective customers and at other relevant events such as conferences (e.g., EuCNC & 6G Summit 2025) and workshops (e.g., srsRAN Project Fall Workshop’25). SRS is a member of industry forums such as the O-RAN Alliance and the 6G IA and is always sharing results and developments when opportunities arise at events. A relevant example of the latter is MWC Barcelona, where SRS showcased the advances of the project with customers in their executive meeting room, while also helping to disseminate relevant UNITY-6G results jointly with other partners.

Independent Power Transmission Operator (IPTO): IPTO contributed to the communication and dissemination of the UNITY-6G project by participating in the ECESCON conference, organized by the Electrical and Computer Engineering Students of Greece and attended by representatives of major Greek companies. IPTO delivered a presentation introducing the UNITY-6G project to the academic and early-career engineer community. The presentation covered the project overall vision and key concepts, as well as IPTO's specific role and contributions within the consortium. This helped to raise awareness of 6G research activities among the next generation of engineering professionals. Furthermore, IPTO published a post on its official LinkedIn page to increase the visibility of UNITY-6G.

Poznan University of Technology (PUT): dissemination and project outreach is an important task at PUT; as WP5 leader, PUT puts efforts in disseminating the service-based architecture in form of a scientific paper (the common effort resulted in dedicated paper accepted and presented at IEEE ICT’26 conference). PUT was also active in other joint publication activities (like paper presented at EuCNC & 6G Summit 2026, URSI GASS 2026, organization of the workshops at conferences, triggering joint paper preparations to journals like IEEE JSAC). PUT has also prepared a dedicated video to the YT channel presenting the implementation progress of the IDMO.

Ceragon Networks (CER): CER has contributed to the dissemination of UNITY-6G updates and results through industry engagement and relevant events. CER is a member of industry forums such as the 6G-IA and regularly shares project results and developments when opportunities arise. For example, at MWC Barcelona, CER showcased project advances to customers in its executive meeting room and supported the joint dissemination of UNITY-6G results with other partners.

Hispasat (HSP): Hispasat contributed to the communication and dissemination activities of the UNITY-6G project through targeted visibility actions at major industry events. In particular, during MWC, Hispasat promoted the UNITY-6G project at its exhibition booth through the

distribution of dedicated communication materials (flyers). These materials introduced the project's objectives, scope, and relevance to NTN and future 6G systems, contributing to increased awareness among industry stakeholders, technology providers, and research organizations. Furthermore, Hispasat participated in Valencia 5G Days and the 5G FORUM, where it presented an overview of the UNITY-6G project. These dissemination actions enabled the project's vision, technical approach, and expected impact to be shared with a broad audience composed of telecommunications experts, policymakers, and innovation actors, fostering knowledge exchange and stakeholder engagement.

Nearby Computing (NBC): NBC actively contributed to the communication and dissemination activities of UNITY-6G by promoting the project and presenting its technical innovations at major international events and scientific forums. NBC participated in MWC 2025 and 2026, and IEEE ICMLCN 2025, where the project was showcased through corporate booth activities, poster sessions, and direct engagement with researchers, telecom operators, and industry stakeholders. In addition, NBC contributed to high-level scientific discussions by participating as a panellist at IEEE ICASSP 2026, and in poster session at ETSI SNS4SNS. NBC also contributed to the dissemination of UNITY-6G scientific results through several peer-reviewed publications in conferences, journals, and magazines, particularly in the areas of cloud-edge orchestration, network exposure, AI-driven service management, and sustainable 6G architectures, further strengthening the visibility and impact of the project within the international research and innovation community.

German Aerospace Center (DLR): DLR has contributed to the promotion and dissemination of UNITY-6G main achievements through the participation to the 2025 and 2026 editions of EuCNC & 6G Summit, a paper presentation at the ICT26 conference, and general project presentations in SNS venues (e.g., within the WG architecture). Notably, DLR was also involved in the co-organization of the NTN workshop ("6G non-terrestrial networks: from theory to practice – Moving towards in-orbit 6G experiments") that took place in EuCNC & 6G Summit 2026, where a dedicated presentation of the UNITY-6G project was delivered. Furthermore, DLR promoted the project for what concerns the NTN-related activities as part of wider promotion in DLR-internal reporting activities as well as in general SatCom-oriented venues.

Four Dot Infinity Information and Telecommunications Solutions Private Company (FDI): FDI has contributed to the dissemination of Unity-6G updates through social media channels, mainly LinkedIn. In addition, FDI has participated in three conferences (MECC 2025, IEEE VTC 2026 and EuCNC & 6G Summit 2026), disseminating key project results related to developed AI/ML-assisted algorithms for O-RAN systems, as well as a multi-RAT handover method. Finally, FDI, being a member of the 6G IA, shares key project outcomes results when opportunities arise at events in industry forums.

Interuniversity Microelectronics Center (IMEC): IMEC has contributed to several events, both scientific and industrial events, in communicating and disseminating results that have been achieved so far in the UNITY-6G project. IMEC has contributed to scientific conferences disseminating the results on wireless TSN and O-RAN compatible IEEE 802.11 APs (IEEE WFCS 2026, IEEE COMNET 2025, EUCNC & 6G Summit 2025 and 2026). In addition, we hosted a tutorial in Wireless TSN utilizing openwifi in IEEE WFCS 2025 conference where we communicated the objectives and targets of UNITY-6G. Colleagues from IMEC presented also in the main industrial forums on time-critical communications such as TSN/A 2025 conference and DEWICOM workshop 2026 where industrial community became aware of the results and achievements of the UNITY-6G project. Recently, IMEC contributed a demo in EuCNC & 6G

Summit 2026 on O-RAN compliant Wi-Fi Access Points for Programmable and Intelligent Multi-RAT Networks, that attracted a lot of attention by the research community. IMEC was active also with the international SDOs such as IEEE, where is actively contributing to the IEEE 802.11 Wireless Next Generation (WNG) working group. So-far IMEC has contributed two presentations and two demos in two meetings of WNG in August 2025 and May 2026. Such activities have enabled to share the project vision, objectives, targets and technical solutions to a broader audience including both research, industry and other stakeholders.

University of Bologna (UNIBO): UNIBO contributed to the dissemination of UNITY-6G main results through the participation in the EuCNC & 6G Summit 2025 and 2026, co-organization of the workshop 'Integrated 6G Architectures and Technologies for Terrestrial and Non-Terrestrial Networks' at IEEE PIMRC 2025, and submission of the following paper 'Semantic-Aware O-RAN Architecture Framework for 6G TN-NTN Integration'.

Martel (MAR): As Work Package Leader with three decades of experience in European research and innovation, MAR has amplified UNITY-6G's visibility by leveraging its own established corporate infrastructure and diverse media platforms, ensuring the project reaches a wider audience of SMEs and digital innovation stakeholders. Furthermore, MAR has utilized its role in several other European projects and international associations to foster synergies and knowledge exchange, positioning UNITY-6G as a central player in the broader 6G research landscape.

National Center for Scientific Research DEMOKRITOS (NCSRD): NCSRD has contributed to the dissemination of UNITY-6G main results through the participation in the IEEE Conferences EuCNC & Summit 2025 and 2026 publishing two IEEE conference papers, "B5G Core Network Openness: A Proof of Concept Implementation of Location Reporting via Network Exposure Function" and "An Open-Source CAMARA UE Location API Implementation over 3GPP NEF for AI-Native Crowd Assessment in 6G Networks". NCSRD is active also with the European Telecommunication Standards Institute (ETSI) contributing to ETSI Software Development Group OpenCAPIF (SDG OCF) developing an open-source Common API Frameworks, as described by 3GPP, allowing to expose and consume APIs in a secure and consistent way. Secondly, NCSRD participates in ETSI Software Development Group OpenOP (SDG OOP) delivering an Open-Source Operator Platform enabling operator network and testbed federation, along with capability exposure of APIs. In addition, NCSRD is a member of the global alliance, CAMARA Foundation.

3 STANDARDIZATION M1-M18

Standardization activities play a critical role in transforming innovative ideas into widely accepted, interoperable, and scalable solutions. By defining common frameworks, terminology, interfaces, requirements, and best practices, standardization enables different organizations, technologies, and ecosystems to work together effectively. It reduces fragmentation, increases trust, supports market adoption, and creates a shared foundation for future development.

Engagement in standardization is especially important when introducing new concepts, technologies, or operational models. Early involvement allows stakeholders to shape the direction of emerging standards, ensure that practical needs are reflected, and promote solutions that are technically sound, commercially viable, and aligned with industry priorities. Without active participation, promising ideas may remain isolated, incompatible, or too difficult to adopt at scale.

By pushing new concepts through standardization activities, organizations can achieve several important outcomes. They can influence industry direction, accelerate acceptance of innovative approaches, create opportunities for ecosystem collaboration, and reduce barriers to deployment. Standardization can also help establish credibility, support regulatory alignment, improve product interoperability, and open new business opportunities by creating a common language between vendors, customers, operators, and policymakers.

3.1 PARTICIPATION IN SDOS

The table below provides information on the UNITY-6G partners' participation in various SDOs.

Table 5: UNITY-6G partners' participation in SDOs

Standardization Bodies	Sub-group	Participating partners	Contribution
3GPP	RAN Plenary, SA5, SA	TID, UNIBO, NCSRD, HSA, Orange, Nokia, CER, IMEC, KEY, DLR	Ongoing
ITU-T	FG-AINN	CTTC, TID, CER, KEY	Unity-6G use cases: FG-AINN-I-WG2-006: Sustainable Networks for Disaster Handling Unity-6G architectural framework: FG-AINN-I-177-R1: Technical Specifications - Architecture Framework for AI Native Telecom Networks

ETSI	ENI, ZSM, MAT, TFS, EMTEL, TM4, SES SCN	CTTC, CER, NBC, IMEC, TID, UNIBO, NCSRD, KEY, DLR, PUT	Unity-6G use cases: GR ENI 055 - V4.1.1: Experiential Networked Intelligence (ENI); Use Cases and Requirements for AI Agents-Based Core Network UNITY-6G framework: GR ENI 056 - V4.1.1 - Experiential Networked Intelligence (ENI); Study on Multi-Agent Frameworks for Next-Generation Core Networks Unity-6G transport: Network Slice Controller Release 7 (ETSI-TFS, TeraflowSDN) UNITY-6G API: ETSI Software Development Group OpenOP (SDG OOP) (ETSI-OpenOP SDG) ETSI Software Development Group OpenCAPIF (SDG OCF) (ETSI-OpenCAPIF SDG)
ORAN Alliance	WG9, nGRG	SRS, TID, Nokia, IMEC, RMD/PUT, KEY	UNITY-6G transport interactions: WP9-O-RAN.WG9.XTRP-MGT.0-R003, "Operational Closed-loops in TNM" Presentation “UNITY-6G project topics related to O-RAN nGRG” to nGRG
GSMA	Operator Platform Group (OPG), Edge Platform Group (EPG), Open Gateway Technical Group (OGWTG)	NBC, Orange	UNITY-6G network exposure features: Open telco AI initiative & Federation implementation choice
TMForum		Orange, PUT	UNITY-6G architecture: Autonomous networks

IEEE		Nokia, IMEC	UNITY-6G WiFi TSN: Openwifi and sub-20MHz co-OFDMA & Openwifi contributions toward Wi-Fi 9 (IEEE 801.11 WNG)
IETF	TEAS WG	TID	UNITY-6G slice support across 3GPP/O-RAN/Transport domains: "5QI to DiffServ DSCP Mapping Example for Enforcement of 5G End-to-End Network Slice QoS" (draft-cbs-teas-5qi-to-dscp-mapping-06)

The table below provides information on the UNITY-6G partners' participation in relevant related projects.

Table 6: UNITY-6G partners' participation in related projects

Project name	Participating partners	Link
CAMARA	NBC	https://camaraproject.org/
ATIS	IMEC	https://atis.org/
NS3	CER	https://www.nsnam.org/
UBBA	CER	https://www.ubba.com/
Khronous group	HOLO	https://www,khronous.org

CTTC currently participates and actively contributes to ITU-T FG FG-AINN Focus Group on Artificial Intelligence Native for Telecommunication Networks. CTTC is also following developments in ETSI ISG ENI for agentic AI and space-ground network management related topics, ETSI ISG MEC for MEC application deployments and ETSI ISG ZSM for service-based architecture design and network management aspects. CTTC will also follow ETSI ENI and ZSM PoCs.

TID: In O-RAN, TID actively participates in WG9 Xhaul Transport, participating as well in the WG focused on architecture, WG1, and the research side of O-RAN (i.e., nGRG). In IETF, TID contributes to a few transports and routing WGs, as well as chairs TEAS, CCAMP and GREEN WGs.

KEY collaborates with various standardization bodies, including 3GPP, ETSI, ITU-T and the O-RAN Alliance (MVP-C, ACOIE, WG3,4,5,9,11, nGRG) to promote and disseminate their research effort, results, best practices and share any new test and measurement methodologies developed thanks to their involvement in UNITY-6G.

Orange will prepare contributions to standardization bodies including: 3GPP SA5, TM forum (Catalyst program) and GSMA to promote and disseminate the results obtained in the framework of UNITY-6G.

Nokia has been a pivotal contributor and leader in the 3rd Generation Partnership Project (3GPP) standardization process, playing a crucial role in shaping the future of mobile communications. As a leading global telecommunications company, Nokia actively participates in various 3GPP WGs and committees, often taking on leadership roles to drive the development of standards for 4G LTE, 5G, and beyond. Its involvement spans across multiple technical areas, including radio access networks (RAN), core networks, and service and system aspects. By collaborating with industry peers, operators, and regulatory bodies, Nokia ensures that the standards developed are robust, interoperable, and capable of meeting the evolving needs of the global telecommunications ecosystem.

In addition to Nokia leadership in 3GPP, Nokia is also a key player and leader in the Open Radio Access Network (O-RAN) Alliance. Nokia actively contributes to the development of open and intelligent RAN solutions that promote interoperability, flexibility, and innovation. Through its participation and leadership in O-RAN WGs, Nokia drives the adoption of open interfaces and standards that enable a diverse and competitive ecosystem, fostering innovation and reducing costs for operators.

Furthermore, Nokia is deeply involved in the IEEE 802.11 standardization process, which governs wireless local area networks (WLANs). Its contributions to IEEE 802.11 include leading roles in enhancing Wi-Fi technology to deliver higher performance, greater reliability, and improved security. By participating in and leading IEEE WGs and committees, Nokia helps shape the evolution of Wi-Fi standards to meet the growing demands for wireless connectivity in various environments, from homes and offices to public spaces and industrial settings.

Nokia's commitment to leadership and active participation in 3GPP, O-RAN, and IEEE 802.11 standardization underscores its dedication to advancing next-generation connectivity, enhancing network performance, and delivering cutting-edge solutions that empower businesses and consumers worldwide.

SRS is a member of the O-RAN Alliance and has developed its O-CU/O-DU product to be compliant with its specifications. Thus, SRS closely monitors the relevant WGs and plans to influence the work performed in these WGs through the innovations related to enhanced O-RAN component extensions and interfaces development that will be developed, validated, and demonstrated during the UNITY-6G lifetime.

PUT is a member of the O-RAN and AI-RAN alliances. As such, PUT monitors the development of the standards and makes progress incorporating these findings in the UNITY-6G work and backwards; In the first part of the projects, potential contribution areas have been identified with other UNITY-6G partners, and new initiatives are going to be proposed to O-RAN Alliance. Besides, PUT is also a member of the TM Forum.

CER has joined ENI (Experiential Networked Intelligence), EMTEL (Emergency Communication) and ZSM (Zero-touch network and Service Management) ETSI groups. CER is also active in NS3 development and participates in UBBA forum.

HSP actively contributes to multiple standardization organisms, including 3GPP, ETSI, and ITU. Within 3GPP, HSP participates actively in standardizing non-terrestrial network (NTN) integration, focusing on satellite communication interoperability and seamless integration with terrestrial networks. In ETSI, HSP engages in the development of standards related to satellite communication systems, addressing the challenges of satellite resource allocation, efficient bandwidth management, and interference mitigation strategies. HSP also actively contributes

to ITU discussions, particularly on spectrum management and regulatory frameworks essential for global satellite communication services.

NBC currently participates and actively contributes to the GSMA Operator Platform Group (OPG), and its subgroups: Edge Platform Group (EPG) and Open Gateway (OPGW) standardization initiatives. This includes participation in online and in-person meetings. In particular, NBC leads efforts on proposing a Kubernetes-based implementation of the East-Westbound Interface (EWBI) APIs in edge federation scenarios. Moreover, the UNITY-6G network exposure capabilities are also aligned with GSMA discussions. In addition, NBC is contributing to the CAMARA initiative for the development of the Northbound Interface (NBI) of telco platforms and the network exposure APIs. Concretely, NBC leads the CAMARA Edge Cloud API family. Finally, NBC follows the developments of ETSI ZSM for the orchestration automation and the closed-loop design.

HOLO is part of the Khronous group. The Khronos Group is an open, member-driven consortium that provides a space for the creation of the interoperability standards that enable developers to harness the full power of 3D graphics, XR (VR & AR), parallel computing, machine learning, vision processing and the metaverse. HOLO actively participates and contributes to the consortium.

UNIBO is both ETSI and 3GPP full member, hence will contribute to the relevant activities dealing with NTN through participation in meetings and documents, preparation where appropriate.

DLR is both 3GPP and ETSI members, hence contributing to the relevant activities dealing with NTN (RAN1-4, SA1-2) and SatCom (as part of the ETSI SES SCN WG). Further to this, contribution to the other WG relevant to the scope of the project such as EMTEL are under definition, with focus on the disaster management use case.

FDI is a full member of 6G-IA, following relevant 6G-IA Working Groups (WGs). Moreover, FDI is also monitoring SDO activities related to 3GPP and O-RAN Alliance, especially related to AI/ML model deployment and lifecycle in the O-RAN architecture, following component and interface extensions, as well as in the management of the AI functions through a AI/ML framework.

IMEC participates and contributes to the ETSI Industry Specification Group (ISG) Multiple Access Techniques (MAT) on interference cancellation based on Machine Learning (ML) approaches. Additionally, in the context of ETSI activities, IMEC has contributed a study on AI Agent-based Next Generation Core Networks. In ATIS, IMEC has contributed to a white paper “Advancing Generative AI Implementation in Telecommunications Networks”. IMEC is closely monitoring IEEE 802.11, following up the ongoing standardization of Wi-Fi 8 and beyond, and sharing the findings via Wireless Next Generation (WNG) working group. Moreover, IMEC monitors the activities in several other standardization bodies including 3GPP, ETSI, ITU, O-RAN without being directly involved in the standardization procedures. It also monitors the Network Management Research Group (NMRG) forum, which focuses on management services that interface with the current Internet management framework.

LINKS is active in Internet Engineering Task Force (IETF) WGs dealing with security protocols for the Internet. LINKS is committed to influence the relevant WGs with outcomes from the UNITY-6G project.

NCSRD currently participates and contributes in ETSI SDG OpenCAPIF towards an evolution of the CAPIF framework with CAPIF-to-CAPIF interaction, SDK for the CAPIF APIs, Ventor-Extensibility feature etc. Moreover, NCSRD is a member of CAMARA initiative for the development of simplified Northbound Interface (NBI) of telco platforms and the network exposure of native 3GPP APIs, mainly focusing on the UE location and QoD sub-groups.

3.2 PARTNERS' INVOLVEMENT IN WORKING GROUPS AND TASK FORCES

This section provides an overview of the partners' involvement in relevant SNS working groups and 6G-IA task forces. It highlights how project partners contribute to ongoing discussions, coordination activities, and strategic initiatives within the European 6G ecosystem. Through this engagement, partners help align the project's work with broader research, innovation, standardization, and policy priorities, while also ensuring that project outcomes are shared with key stakeholder communities.

Table 7: UNITY-6G representation in SNS Boards and Task Forces

Board/Task Force	Representatives	Partner
Steering Board	Engin Zeydan, Selva Via	CTTC
Technology Board	Luis Miguel Contreras, Luis Blanco	TID, CTTC
Communication Task Force	Klaudia dos Santos, Kevin Keyaert	MAR

Table 8: Partners' involvement in SNS, 6G-IA & NetworldEurope Working Groups

SNS Working Groups	Partners involved
6G Architecture	NCSRD, Orange, DLR
Reliable Software Network	NBC
Test, Measurement and KPIs Validation	KEY
Sustainability	DLR
6G-IA Working Groups	**Partners involved**
Vision	CTTC
Open Smart Networks and Services	CER
Trials	CER (listening), MAR
Pre- Standardization	TID
Spectrum	DLR (observer), CER
Security	NCSRD
WiTaR	NCSRD, HOLO, CTTC

NetworldEurope Working Groups	Partners involved
SMEs	FDI, MAR, NBC
NTN	UNIBO, DLR

4 EXPLOITATION M1-M18

During the first 18 months of the project, the UNITY-6G consortium progressed from the initial exploitation framework defined in D7.1 *Dissemination, Standardization, and Exploitation Plan*[4] towards a more operational approach aimed at identifying, monitoring, and preparing the uptake of the project's Key Exploitable Results (KERs). In line with the overall UNITY-6G impact-creation strategy, exploitation activities focused on ensuring that the technical outcomes generated by the project could be effectively transferred beyond the consortium, supporting future commercialization pathways, academic impact, standardization uptake, open-source contributions, and industrial adoption.

Furthermore, the exploitation work carried out in M1–M18 was closely connected to the maturation of the project's technical activities. As the UNITY-6G architecture, use cases, and enabling technologies advanced, the consortium started refining the preliminary exploitation perspectives described in D7.1 and mapping them against the emerging project results. This process supported the identification of potential assets related to AI-native network management, Open RAN-enabled control, terrestrial and non-terrestrial network integration, distributed applications, digital network twinning, semantic communications, trustworthy federated learning, orchestration, and sustainability-aware 6G operation.

To this end, a key activity performed during the reporting period was the preparation of the first Intermediate Application Analysis Report. This report analyzed relevant technological, market, regulatory, and application trends connected to the UNITY-6G thematic areas. In particular, it considered trends related to sustainable and energy-efficient 6G networks, AI-native and autonomous network management, Open RAN evolution, edge-cloud continuum orchestration, NTN/TN integration, network digital twins, distributed ledger-based trust mechanisms, and emerging vertical requirements. The outcome of this analysis provided an updated view of the external landscape in which UNITY-6G is positioned and helped the consortium assess how ongoing trends could influence the project's technical and exploitation direction.

The Intermediate Application Analysis Report also served as an internal decision-support instrument. By linking external trends to UNITY-6G's technical objectives and use cases, it helped identify which project results were likely to have the strongest exploitation potential and which areas required additional alignment with market expectations, standardization developments, and stakeholder needs. This analysis contributed to steering the project towards results with clearer value propositions, stronger relevance for industrial adoption, and higher potential for long-term impact.

In parallel, UNITY-6G enrolled in the European Commission Booster program to obtain professional support on the exploitation of selected project KERs. This action was taken to strengthen the consortium's exploitation capacity through external expert guidance, particularly in the areas of KER characterization, value proposition definition, market positioning, exploitation route assessment, and preparation of actionable exploitation plans. The support received through the program is expected to complement the internal exploitation work of the

[4] https://unity-6g.eu/wp-content/uploads/2025/04/UNITY-6G_D7.1.pdf

consortium and to provide a more structured methodology for progressing from technical results to exploitable assets.

Overall, the exploitation activities performed during M1–M18 laid out the groundwork for a more focused exploitation strategy in the second half of the project. While the first reporting period concentrated on identifying exploitable directions and understanding the relevant technological and market context, the next phase will further consolidate the KER portfolio, refine ownership and access rights where applicable, and define concrete exploitation routes for both joint and individual results.

4.1 INTELLECTUAL PROPERTY MANAGEMENT: IDENTIFIED INNOVATIONS AND ROADMAP TO POTENTIAL PATENTS

This section provides an overview of the intellectual property (IP) management activities carried out during the first reporting period, focusing on the identification and initial handling of innovations with potential for protection and exploitation.

Building on the broader exploitation framework described in Section 4, this subsection outlines how the UNITY-6G consortium translated emerging technical results into candidate IP assets, including early-stage patentable ideas and key exploitable components. In particular, it summarizes the main innovations identified by consortium partners and their current status within internal evaluation or protection processes.

At the moment of writing this deliverable, the following innovations developed through UNITY-6G have been identified for intellectual property protection and exploitation:

- **CTTC** has identified a potential patent innovation related to trustworthy cross-domain service orchestration for future networks. This is currently being handled through internal invention and evaluation process.
- **IMEC** has identified a potential innovation to be protected that relates to the scheduling mechanism in wireless time sensitive networking related to utilization of the short time slots. The idea is currently being handled in an internal process within IMEC, after which it will be filed by the internal patent office.
- **IMEC** also plans to exploit the “O-RAN enabled IEEE 802.11 access points (APs)” Key Exploitable Result. This solution effectively extends the O-RAN E2 interface to interact not only with 3GPP RAN nodes, but also with IEEE 802.11 APs. In turn, this enables cross-domain optimization across multi-RATs. The exploitation of this KER will be supported by the EC Booster go-to-market initiative.
- The UNITY-6G consortium, with **PUT** leading the implementation efforts, had identified a Key Exploitable Results in the “Inter-Domain Manager and Orchestrator (IDMO) Implementation”. The exploitation of this KER will be pursued internally within PUT, with the support of the UNITY-6G consortium and the EC Booster initiative, to leverage the latter for go-to-market support.

4.2 INDIVIDUAL PARTNERS' EXPLOITATION STATUS

During M1–M18, all partners actively contributed to the exploitation process in line with their respective roles, assets, and organizational priorities. The individual exploitation pathways defined in D7.1 served as the initial reference framework, distinguishing between academic, industrial, standardization-oriented, and ecosystem-building exploitation approaches. Building on this foundation, partners progressively refined their strategies by aligning them with both the technical outcomes achieved during the reporting period and the evolving landscape of 6G research and innovation.

Academic and research partners primarily advanced exploitation through scientific dissemination, development of technical know-how, contributions to peer-reviewed publications, and participation in workshops and conferences. These activities supported the establishment of a strong academic legacy and contributed to positioning UNITY-6G results within the broader 6G research community. In addition, their work on algorithms, architectural concepts, and validation methodologies is expected to evolve into reusable research assets, such as open-source components, datasets, and inputs for future European and national research initiatives.

This progressive refinement of exploitation strategies was further strengthened by the insights provided by the first Intermediate Application Analysis Report, which is submitted alongside this document. By delivering a structured assessment of technological trends, market dynamics, and application domains across the UNITY-6G thematic areas, the report enabled partners to contextualize their results within a rapidly evolving ecosystem. In particular, its analysis of key domains such as AI-native networking, sustainable 6G, Open RAN, NTN integration, edge-cloud orchestration, network automation, trust management, and digital twin-based validation supported a more informed positioning of Key Exploitable Results (KERs) and helped align individual exploitation pathways with areas of increasing strategic relevance and impact.

In parallel, the project's exploitation activities benefited from strong synergies with dissemination and standardization efforts. Technical demonstrations at major events, scientific publications, engagement in standardization-related discussions, and interactions with other SNS projects significantly increased the visibility and credibility of UNITY-6G results. These activities had the twofold benefit of reinforcing the project's presence within the research and innovation ecosystem, and facilitating early exposure of emerging results to potential adopters, collaborators, and standardization communities, thereby improving the conditions for future uptake.

To reflect this consolidated and evolving approach, the remainder of this section presents the updated individual exploitation plans of all consortium partners. These plans build upon the initial intentions defined in D7.1 and incorporate their progressive refinement based on both the technical achievements of M1–M18 and the strategic insights derived from the Intermediate Application Analysis Report. Looking ahead, partners will continue refining their individual exploitation strategies in the second half of the project. This process will be reported in D7.3 and will further benefit from the feedback obtained through the EC Booster programme. In particular, it will aim to establish a clearer and more actionable mapping between partners, KERs, target stakeholders, exploitation routes, expected impacts, and potential barriers to adoption.

CTTC: as mentioned in previous section, CTTC has identified a potential patent innovation related to trustworthiness for future networks, which is currently being internally evaluated. Also, an open-source software contribution on “FL-DApp: Open-Source Decentralized Application for Reputation in O-RAN Federated Learning” has been already published. Moreover, CTTC has actively participated in ITU-T (FG-AN), having provided two contributions, and attended ETSI activities, to ensure that its research and development efforts align with the latest industry standards and best practices. Moreover, as a member of 6G-IA, 6G Smart Networks and Services (JU-SNS) CTTC will exploit the project’s results to the 6G industrial community in Europe.

UNIBO’s participation in UNITY-6G aims at gaining new knowledge regarding 6G energy-efficient integrated networks based on AI and Open RAN. In particular, the results achieved during the project will allow for extending simulations and analytical tools for integrated networks, enriching the teaching material and thus increasing the employability of UNIBO graduates, as well as aiding the acquisition of new projects in the field of 6G integrated networks. Additionally, UNIBO is a member of 6G-IA, and is active in SNS and ESA projects; UNIBO intends to create synergies among these initiatives to define a solid research and innovation roadmap to unleash the full potential of future 6G wireless communications and service infrastructure.

DLR’s participation in UNITY-6G is mostly focused on extending the heritage from NTN-related activities towards semantic-oriented NTN communications and overall energy-efficient 6G integrated networks and hence promote corresponding technology transfer plans, especially in terms of IPR activities, such as licensing and patenting of the concepts and solutions worked out during the project. Moreover, the results of the project are presently used to preliminarily extend the existing testbeds and investigation tools in the context of satellite networks, hence supporting the acquisition of new projects in the domain of 6G-converged networks with special focus on the potentials of semantic communication, O-RAN-based architecture, and overall optimization of networking operations through AI for resource management, network orchestration, and edge computing. Last but not the least, DLR is part of 6G-IA, and active in SNS projects granted from the first SNS calls (e.g, 5G-STARDUST, 6G-NTN concluded end of 2025 and early 2026 respectively, and NexaSphere running until end 2027) as well as in other initiatives funded by ESA (e.g., MIXELS) and German (6G-COVERAGE) national programmes. Therefore, DLR’s mission is also to create synergies across all these initiatives and hence possibly influence the development roadmap of European industry through a solid research and innovation roadmap.

IMEC’s key exploitable results relate to the incorporation of IEEE 802.11 technology into 6G networks, leveraging its open-source full-stack Wi-Fi implementation with time-sensitive networking extensions. In addition to this IMEC will exploit the O-RAN-based control of Wi-Fi APs for further integration with 6G networks at control level. As a research centre interfacing between university and industry, IMEC’s exploitation of these results is closely linked to its mission of creating and disseminating scientific knowledge in the field of wireless communications and associated applications. Concretely, IMEC will strengthen its existing research programs and education program (in collaboration with Ghent University) and realize its exploitation to industry via ‘Industrial Affiliation Programs’, bilateral projects, IP transfer and licensing. In the affiliation program, IMEC teams-up with leading companies across the value chain, in which they get early access in 6G technologies and can use IMEC’s know-how and prototype modules to accelerate the development of their next generation products. The

outcome and accumulated experience acquired from this project will enable the participation in new related collaborative research projects, where the obtained results will be exploited, extended or adapted to new research challenges.

As a non-profit research centre with the primary objective of technology and knowledge transfer, **LINKS** will contribute security solutions to build trust between the components of the UNITY-6G architecture. The technical results will form the basis for the development of new security assets to be exploited within the LINKS network of industrial partners, and the knowledge gained will be used to develop new research-funded projects.

NCSRD's participation in UNITY-6G is seen as a direct step toward establishing a strong research and scientific position in the field of future 6G network architectures and management systems of O-RAN. NCSR Demokritos will gain experience and expertise in novel 6G network infrastructures and related technologies (rApps, xApps, NEF APIs, programmability, metrics monitoring) leading to the development of an automated experimentation framework for KPI assessment on top of its 6G infrastructures. Such technologies, developed by NCSRD within the project, are planned to be further exploited as services offered by NCSR Demokritos to external SMEs in the framework of the digital innovation hub “Ahedd” that operates within NCSR Demokritos premises. Furthermore, DEMOKRITOS is home to the "Lefkipos” Technical Park, which houses many private companies and startups in the fields of IT and telecommunications, where the results of the Athens platform trials will be promoted, looking for possible synergies and joint ventures.

Moreover, NCSRD foresees further exploitation opportunities of the expertise gained in 6G and O-RAN through the signed partnership with 5G Ventures SA responsible for the establishment and management of Phaistos Investment Fund. The objective of the Phaistos Investment Fund is the public investment in businesses that are actively involved in 5G-related research and/or development of products and/or services in Greece, in sectors such as transport and logistics, manufacturing, public goods and utilities, health, tourism, information and media. Finally, NCSRD plans to exploit further the 6G/O-RAN expertise gained within the project, by conducting innovation activities related to entrepreneurship, and for that purpose has proceeded to a collaboration agreement with the Municipality of Egaleo, and more specifically with the Entrepreneurship hub for fostering further the development of innovative products and services related to 5G and Network Apps by startups and young teams that are willing to get involved in the field.

HES-SO's participation in UNITY-6G will reinforce its expertise in both energy efficient and green cellular networks planning and management, while valorising its testbeds and know-how in microgrid energy management and optimization. The results of the project will be valorised at the national level in the collaborations with national telecom operators, as well as with local energy production and distribution operators

SRS leads the technical development of OCUDU (previously srsRAN), a fully open-source project hosted by the Linux Foundation, that has the commitment of providing the open, commercial-grade RAN solution that industry, government and research needs - the Linux of RAN. OCUDU has a clear multi-year roadmap. The O-CU/O-DU solution developed by SRS is made freely available to the public under a license-permissive license (BSD 3-Clause Open MPI). This approach not only facilitates adoption and the commercialization of the solution, by enabling new players in the mobile wireless ecosystem by removing barriers to entry but also fosters innovation within the R&D community. Modifications and developments to the CU/DU

made as part of the project will be made available to the public via the OCUDU open-source code base. SRS aims to continue expanding and improving our solutions through interactions with, and feedback from, project partners. Provision of dedicated support and customization services are additional clear business opportunities stemming out of OCUDU.

NBC has continued advancing its exploitation strategy throughout the first 18 months of the project by integrating UNITY-6G research outcomes into the evolution of its NearbyOne orchestration platform. In particular, NBC has strengthened its expertise in AI-driven cloud-edge service orchestration through active participation in technical activities and dissemination events such as MWC 2026, which provided a key opportunity to demonstrate AI/ML-assisted orchestration mechanisms for dynamic workload prediction, resource optimization, and intelligent service placement across distributed cloud-edge environments. The NBC demonstration at MWC 2026 significantly increased the company's visibility and fostered new collaboration and commercial opportunities with telecom operators, research organizations, and industrial stakeholders, particularly in the areas of AI-assisted edge-cloud orchestration. In parallel, NBC has also reinforced its engagement in standardization and industry initiatives. Notably, a project-related development led by NBC has been accepted for inclusion in a future release of GSMA OPG technical documentation, while NBC has also assumed a leading role within the CAMARA initiative by leading the Edge Cloud API family. These activities further strengthen NBC's position in the emerging ecosystem of interoperable, AI-native, and service-oriented 6G platforms.

TID will leverage on the project results for the technological evolution of TID's networks, to be prepared for delivery of 6G services in the different markets where TID operates incorporating the novelties provided by UNITY-6G. The project results and experience will facilitate the definition of guidelines, and the identification of the more efficient and sustainable strategies of evolution. Furthermore, to generalize the support of the developed ideas and solutions, TID will incorporate new requirements related to them in the commercial global RFQs/RFPs launched to the industry for acquisition of new network equipment.

KEY will continue leveraging the outcomes of the project to innovate its techniques for measurement, data collection, processing and analytics for highly distributed, AI-native, micro service architectures. These advances will lead to novel monitoring, validation and testing methodologies targeting extreme 6G use cases, which in turn will be validated using the PoCs developed throughout the project duration.

Orange is a world's leading telecommunications and global IT services provider. Orange's researchers explore technological breakthroughs, new uses and innovative business models. In this sense, Orange is a major actor in the networking open-source ecosystem and a founder member and key contributor of the O-RAN Alliance. Orange staff involved in this project has expertise in Radio Access Network (RAN) architecture evolution, openness, and standardization. They are also familiar with network functions virtualization and RAN Softwarization. By contributing to UNITY-6G, Orange wants to answer multiple concerns and questions that are also discussed within the O-RAN alliance. For instance, Orange aims to acquire expertise in: how to design a distributed and scalable O-RAN architecture, which are the pros and cons of the different functional splits of the RAN in a Satellite architecture, and understand which functions can be embedded in a satellite and which types of metrics/measurements can be retrieved from the different functions. Orange will also leverage its participation in UNITY-6G's WP4 (AI driven distributed intelligence), to propose AI solutions for the optimization of resources in edge-cloud continuum.

Furthermore, Orange is striving to meet its environmental objective in terms of energy saving, through many studies done in the Radio and within 3GPP to reduce the carbon footprint in these scopes. Orange aims to leverage its participation in UNITY-6G to further address this topic and propose a solution that includes Core and Radio energy efficiency

Nokia is global leader in technologies that connect people and things, with a position of strength in subscriber data management, edge and core routers, and mobile and optical communications. Nokia's research and innovation arm, Nokia Bell Labs, creates the disruptive technologies that are shaping the way the world communicates and connects. Within the context of UNITY-6G, Nokia will use the outputs of the project to contribute to the development of IEEE 802.11 standards (focusing on Wi-Fi 8 and AI/ML for Wi-Fi) and to enhance the portfolio of Wi-Fi-related products. In addition, the development of open-source solutions (both simulation and testbed-based) is expected to generate an impact in academia, thus potentially finding synergies with PhD programs across the world.

IPTO is the Operator of the Hellenic Electricity Transmission System, with the mission to ensure Greece's electricity supply in a safe, efficient and reliable manner while promoting the development of competition in the Greek electricity market and guaranteeing the non-discriminatory treatment of System users. IPTO will capitalize on project's results and outcomes to engage with the telecommunication network owners as prosumers (consumers and prosumers) by exploiting the provided flexibility services, contributing to the decarbonization of the power grid and the increase of its overall reliability and robustness.

PUT aims at using the UNITY-6G results to extend the portfolio of xApps/rApps within the O-RAN field, to address new use cases for private mobile networks including the radio resource management features, AI-native solutions, and semantic communications. Moreover, advances in conflict mitigation and digital twinning will be further leveraged in company offerings towards the dynamically evolving O-RAN market. PUT has put also much effort in IDMO implementation, resulting in classifying it as one of the Key Exploitation Results of the project at this stage; PUT envisage further development of IMDO twofold – in and open-source track, and as the dedicated advanced scientific contribution for multidomain service orchestration. As the university partner, PUT also exploits the project results and outcomes in the teaching activities.

CER aims to use UNITY-6G results to extend the portfolio of products and solutions for private network verticals, such as public safety, utilities and smart cities. The enhanced managed network, based on AI, creates new opportunities to provide enhanced end-to-end solutions. Specifically, the integration of NTN links and TSN solutions opens new solutions and research directions.

With extensive experience and capabilities in satellite communications, **HSP** will exploit the outcomes of UNITY-6G to reinforce and expand its market position as a global leader in advanced satellite communications. By actively contributing to the integration of satellite and terrestrial network technologies, HSP intends to develop and validate innovative solutions designed to enhance connectivity, reliability, and service coverage. These solutions will directly address growing market demands across strategic segments such as rural broadband, maritime services, emergency communications, and mobility applications, enabling the company to diversify its service portfolio and attract new customers.

Through active engagement in key standardization bodies such as ETSI, 3GPP, and ITU, HSP will leverage project findings to influence and shape essential technical standards and

protocols, ensuring interoperability and widespread acceptance of satellite-terrestrial integration within future networks. Additionally, the company will secure intellectual property rights generated from UNITY-6G developments, strengthening its technological assets and creating opportunities for potential licensing agreements.

HSP will also engage actively in strategic dissemination and outreach activities, showcasing project advancements at significant industry events, conferences, and other relevant telecommunications forums. This visibility will position HSP as a forward-looking innovator in integrated satellite communications, facilitating new strategic partnerships and reinforcing relationships with terrestrial network providers, equipment manufacturers, and academic institutions, further driving market adoption and sustainable growth.

NBC is an SME in the area of end-to-end (e2e) network and service orchestration, focusing on the challenges at the Edge. NBC will provide their NearbyOne platform, which carries intra- and inter-domain orchestration capabilities and addresses the problem of xNF (CNF, VNF, etc.) and application orchestration in the cloud continuum. NBC will exploit the achievements of the project to improve their flagship product in a multifaceted manner: i) the AI/ML models developed in the project are expected to enhance the orchestration capabilities and place NearbyOne in an advantageous position in the market of zero-touch service and network management; 2) the project-specific use cases will open new directions and foster new collaborations and partnerships with 5G stakeholders (e.g., telecom operators) and vertical industries (e.g., holographic applications); 3) the development of new interfaces will strengthen the position of NBC in relevant standardization bodies (e.g., GSMA OPG and CAMARA); and 4) the upgrade of the product is expected to facilitate the participation of the company in future research projects on 6G networks, where the AI-enabled network self-organization will be inherent by design. To that end, progress and results of this project will be shared with the development team and discussed with interested stakeholders and potential customers in innovation venues.

HOLO's XR software development kit with remote application rendering will be enhanced with 6G networking capabilities. To this end, the outcomes of the UNITY-6G project will increase the adoption of remote application rendering and support XR market growth, currently stalled by device and network limitations. Additionally, 6G's ultra-low latency and high bandwidth will enable seamless collaborative and multiplayer XR applications, ensuring real-time synchronization, spatial consistency, and immersive interactions across remote users. This will significantly enhance shared virtual experiences, making large-scale, high-fidelity multiplayer environments more viable. Furthermore, UNITY-6G will develop a highly decentralized 6G architecture featuring edge computing capabilities which natively supports AI-driven contextual adaptation. These advancements will pave the way for highly scalable, efficient, and interconnected XR ecosystems.

FDI will use the results of the project to enhance its product portfolio and integrate the new knowledge to extend existing services in artificial intelligence and machine learning technologies. In particular, FDI, either individually or in collaboration with other interested partners from the consortium, is planning to offer interested customers AI as a Service service (xApps, rApps, dApps). Most importantly, cooperating with large industrial partners within this project may lead to strategic alliances in the field of commercialization and technology transfer of innovative aspects of artificial intelligence and digital apprentice technologies. Furthermore, since the results of UNITY-6G are intended to be integrated into existing solutions, FDI will find opportunities to exploit established partnerships and B2B or B2C relationships for future

adoption. Finally, FDI will also seek collaborations with interested stakeholder groups to maximize the exploitation potential.

MAR aims to strengthen its position in AI-driven network automation, cloud-native telecommunications, and intelligent orchestration for 6G infrastructures. Through UNITY-6G, MAR is expanding its expertise in multi-agent systems, LLM-based decision support, predictive analytics, and cloud-native service management. MAR will reuse and extend the knowledge, software components, and architectural approaches developed in UNITY-6G in future European 6G-related or AI-related projects, autonomous orchestration, energy-efficient infrastructures, and integrated TN/NTN. Furthermore, Martel will leverage the acquired know-how and expertise to prepare and deliver commercial technical training to its customers. The acquisition of new expertise and knowledge via participation in UNITY-6G, the exposure gained through the planned stakeholders' engagement and the leadership of WP7 on dissemination, communication, and exploitation will allow MAR to offer advanced innovation management consulting and media services in the European and international R&D&I context.

5 UPDATED STRATEGY M19-M36

5.1 PLANNED COMMUNICATION, DISSEMINATION, AND COMMUNITY BUILDING ACTIVITIES

As UNITY-6G enters Stage 3 (Wide Outreach and Sustainable Impact), the strategy shifts from reporting progress to driving the adoption of project results. The activities for the final 18 months are designed to scale up dissemination efforts and ensure a lasting legacy in the 6G ecosystem.

Planned activities include:

- **Multimedia content**: The consortium will produce a final series of videos, focusing on project demos and a "Project Legacy" video to summarize key achievements.
- **High-impact publications**: Building on the initial research success, partners will target top-tier journals and magazines to publish final validated results, focusing on AI-driven network management and sustainability metrics. Partners will also continue providing input to collaborative SNS JU white papers.
- **Strategic event presence**: UNITY-6G will maintain a strong presence at flagship events, with a focus on MWC 2027, EuCNC & 6G Summit 2027, one6G Summit 2027, and several IEEE events, where consolidated project results will be showcased.
- **Joint dissemination initiatives**: Following the established liaisons, the consortium will co-organize workshops and webinars with related SNS JU projects to discuss common 6G architectural visions.
- **Targeted newsletters and press releases**: The bi-yearly newsletter will continue to provide updates, supplemented by targeted press releases to announce major technological breakthroughs and the final project outcomes to European media outlets.
- **UNITY-6G integration stories**: Blog post campaign to showcase how consortium partners addressed key integration challenges across the project's flagship use cases. Proposed topics include AI-driven resilience and sustainability for disaster-response networks (UC1), real-time holographic collaboration over semantic-aware 6G networks (UC2), Digital Twins for predictive and autonomous 6G network management (UC3), and unified O-RAN control of cellular and Wi-Fi networks for Industry 4.0 applications (UC4).
- **Sustainability of digital assets**: The project website and Zenodo repository will remain active beyond the project duration, providing a permanent reference for UNITY-6G innovations.

This updated strategy ensures that the momentum generated in the first half of the project is leveraged to maximize the visibility and long-term benefit of UNITY-6G's findings.

5.2 UPDATED STANDARDIZATION STRATEGY

5.2.1 Strategic positioning

UNITY-6G should position its standardization contribution around one main message: UNITY-6G advances a sustainable, scalable, AI-native, service-based 6G architecture for integrated

heterogeneous networks, where Open RAN, NTN/TN, xHaul, NPN, edge, core and cloud domains are managed through distributed AI, digital twins, semantic communication, trusted automation and open interfaces.

This is directly aligned with the vision outlined in D7.1 *Dissemination, Standardization, and Exploitation Plan*[5], which states that UNITY-6G targets a sustainable and scalable integrated AI-native architecture across NTN/TN, xHaul, Open RAN, NPN, edge, core and cloud, with distributed applications, common interfaces, service-based principles and digital twins for network evaluation. It also matches the project proposal's Objective 1, which extends SBA beyond the 5G core into a distributed management plane spanning Open RAN, Core, Cloud, Edge, NTN, Transport and multi-RAT NPN.

5.2.2 Priority standardization workstreams

Workstream A - AI-native integrated 6G architecture

What to advance: UNITY-6G should promote a reference architecture for AI-native integrated 6G networks, where the management, analytics, decision and actuation functions are distributed across heterogeneous domains. The key contribution is not only "AI for optimization," but an architectural model where AI is native to the control and management fabric.

The concrete concepts to advance are:

Topic	Contribution focus	Main venues
Integrated AI-native SBA	Extend SBA principles beyond 5G Core to Open RAN, NTN, transport, NPN, edge/cloud	3GPP SA/SA5, ETSI ZSM, ETSI ENI, ITU-T FG-AINN
Distributed management entities	Monitoring, Analytics, Decision Engines, Actuators deployable per domain	ETSI ZSM, ITU-T FG-AINN, 3GPP SA5
Cross-domain service lifecycle management	Service deployment, exposure, automation and local decision-making across domains	ETSI ZSM/MEC, TM Forum, CAMARA, GSMA
Architecture validation through PoCs	Use UNITY-6G PoCs as evidence for feasibility and gaps	ETSI PoCs, ITU-T FG-AINN, O-RAN, SNS/6G-IA

Why: The proposal explicitly identifies distributed management entities, proactive decision-making, security/trust modelling, and integration of 5G Core SBA with Open RAN, edge-cloud, satellite and xHaul as core R&D topics.

Workstream B - Distributed AI, MLOps and trustworthy AI lifecycle

What to advance: UNITY-6G should push standardization of the AI/ML lifecycle for distributed 6G networks, including model training, deployment, monitoring, drift detection, retraining, trustworthiness, energy impact and model governance.

[5] https://unity-6g.eu/wp-content/uploads/2025/04/UNITY-6G_D7.1.pdf

The AI/ML landscape document highlights that current standard frameworks already exist in 3GPP, ITU-T, O-RAN and ETSI, and that the converged direction is modularity, interoperability and dynamic adaptation in AI/ML operations. It also stresses MLOps as a necessary lifecycle framework for data collection, training, validation, deployment, monitoring and retraining.

Topic	Contribution focus	Main venues
Distributed MLOps for 6G	Common lifecycle for models deployed across cloud, edge, RAN, transport and NTN	ITU-T FG-AINN, O-RAN AIMLFW, ETSI ENI/ZSM
AI model monitoring	Drift, accuracy degradation, inference performance, service impact	O-RAN AIMLFW, 3GPP SA5, ETSI ZSM
Trustworthy AI	XAI, robustness, traceability, policy compliance, model versioning	ETSI ENI, ETSI SAI, ITU-T
Sustainable AI	Energy-aware model training/retraining and AI carbon/energy KPIs	ETSI ZSM, 3GPP SA5, ITU-T, IETF GREEN

Why: The proposal prioritizes distributed AI techniques such as federated learning, multi-agent reinforcement learning, split learning, in-device learning, collaborative inference and knowledge distillation, while also emphasizing XAI, trustworthiness and robustness.

Workstream C - Open RAN evolution: dApps, xApps/rApps and real-time distributed intelligence

What to advance: UNITY-6G should use its Open RAN angle to push a real-time distributed and network-state-aware Open RAN architecture, where dApps complement xApps and rApps for stricter timing, cross-domain control and integrated network optimization.

Topic	Contribution focus	Main venues
dApp concept	Define role, lifecycle and interfaces of distributed applications complementing xApps/rApps	O-RAN Alliance, ETSI ZSM, ETSI MEC
AI-driven RAN/resource optimization	AI for RAN slicing, resource allocation, user-centric UPF placement, edge/cloud offloading	O-RAN, 3GPP RAN/SA5
Transport-aware Open RAN	Integrate transport management interfaces into O-RAN, including xHaul constraints	O-RAN WG9, IETF TEAS/CCAMP, UBBA
O-RAN + NTN integration	Requirements for satellite-terrestrial Open RAN operation	O-RAN, 3GPP NTN, ETSI SES SCN

Why: D7.1 states that UNITY-6G aims to evolve toward real-time, distributed, network-state-aware Open RAN using distributed applications that complement xApps/rApps. The proposal also notes that CER will push transport management interfaces into O-RAN WG9, while HSP, CTTC and others will follow NTN-related standardization in 3GPP, ETSI SES and ESA-ALIX.

Workstream D - Digital twin for integrated 6G evaluation

What to advance: UNITY-6G should push network digital twin interfaces and evaluation methodologies as a standardization topic. The key value is to use the digital twin not only as a simulation tool, but as a controlled validation environment for AI/ML models, energy-efficient resource management, resiliency, and zero-touch automation.

Topic	Contribution focus	Main venues
Digital twin architecture	Functional architecture for integrated TN/NTN/Open RAN/NPN/edge-cloud twinning	ITU-T, ETSI ENI/ZSM, 3GPP SA5
DT data models	Scenario descriptors, telemetry inputs, network state representation	SNS TMV WG, ETSI, ITU-T
GenAI-enhanced DT data	Synthetic data for training/testing AI models	ITU-T FG-AINN, ETSI ENI
DT-based validation	Pre-deployment testing of AI policies, configurations and closed-loop actions	ETSI PoCs, O-RAN, SNS Stream C/D projects

Why: The proposal defines a digital twin application with GenAI-enhanced data for zero-touch network and service management, intended to test AI-based resource management and energy-efficiency solutions before live deployment. It also describes the Digital Twin use case as a digital replica of the integrated heterogeneous infrastructure for resiliency, predictive control, and AI-driven closed-loop management.

Workstream E - Semantic-aware communication and network exposure

What to advance: UNITY-6G should promote semantic communication as a network exposure and resource-efficiency enabler, rather than only a PHY-layer or application-layer concept. The project can contribute requirements, APIs and evaluation metrics for semantic-aware service delivery.

Topic	Contribution focus	Main venues
Semantic communication APIs	APIs exposing semantic needs, accuracy/latency trade-offs and application intent	CAMARA, GSMA, ETSI MEC, ETSI OPENCAPIF
Semantic-aware resource allocation	Use semantic information to reduce overhead and optimize SLA delivery	3GPP SA/RAN, O-RAN, ITU-T
Semantic-aware NTN/Open RAN	Framework for semantic NTN integrated with Open RAN	O-RAN, 3GPP NTN, ETSI SES SCN
KPI definition	Communication overhead reduction, SLA preservation, latency, accuracy, energy	SNS TMV WG, 3GPP SA5, ETSI ZSM

Why: The proposal states that semantic communication will be embedded as a new paradigm to improve energy efficiency, robustness, sustainability, communication quality and user experience, and targets architectures, protocols and network exposure APIs for semantic

information processing. It also defines measurable outcomes such as reducing communication overhead by a factor of 10 while maintaining SLA requirements.

Workstream F - Sustainability, green KPIs and energy-aware automation

What to advance: UNITY-6G should make sustainability a cross-cutting standardization pillar. The project should not only report energy savings but propose standard KPIs and control-loop requirements for sustainable 6G operations.

Topic	Contribution focus	Main venues
Energy-aware orchestration	Energy as a first-class resource in orchestration and LCM decisions	ETSI ZSM, 3GPP SA5, ITU-T
Green AI lifecycle	Energy cost of AI training/retraining and inference	ITU-T FG-AINN, ETSI ENI, O-RAN AIMLFW
Renewable-aware networking	Use renewable energy availability in network management decisions	ETSI, IETF GREEN, 3GPP SA5
6G KPI consensus	Energy, carbon, reliability, latency, service recovery, automation KPIs	SNS TMV WG, 6G-IA, 3GPP, ETSI

Why: D7.1 identifies energy efficiency and sustainability as central challenges, with AI, edge-cloud computing and network softwarization required to support intelligent, adaptive and scalable solutions. The AI/ML landscape also recommends integrating sustainability metrics directly into MLOps pipelines so models are evaluated not only for performance but also for environmental impact.

5.2.3 Target standardization venues

This section summarizes the target standardization venues relevant to the project's expected standardization impacts. Rather than addressing the impacts from a technical perspective, it presents them from the viewpoint of the relevant Standards Development Organizations (SDOs), identifying the groups, committees, and task forces where the project results may be most appropriately positioned. This overview helps clarify where contributions can be directed, how they align with ongoing standardization activities, and which venues offer the strongest potential for future impact.

Venue	What UNITY-6G should contribute
3GPP SA/SA5/RAN	AI-native management requirements, service-based management, NTN/TN integration, energy-aware OAM, AI/ML model monitoring, KPIs
O-RAN Alliance	dApps, xApp/rApp interaction, AI/ML framework evolution, RIC model monitoring, Open RAN + NTN, O-RAN transport interfaces
ETSI ENI	AI-enabled autonomous networking, agentic AI, intent-based management, explainability and policy-driven automation
ETSI ZSM	Zero-touch closed-loop automation, cross-domain orchestration, service lifecycle management, distributed control loops

ETSI MEC / OPENCAPIF / CAMARA / GSMA	Network exposure APIs, semantic-aware APIs, edge-cloud service exposure, customer-facing APIs
ITU-T FG-AINN	AI-native telecommunications architecture, distributed AI lifecycle, trustworthiness, AI-native network requirements
IETF/IRTF NMRG, TEAS, CCAMP, GREEN	Transport-aware automation, telemetry, routing/traffic engineering, green networking, management research
IEEE 802.11 AI/ML TIG	AI/ML for Wi-Fi / multi-RAT NPN and deterministic wireless
ETSI SES SCN / 3GPP NTN	Satellite-terrestrial integration, NTN interfaces, 3D network architecture
SNS JU / 6G-IA / NetworldEurope WGs	Pre-standardization consensus, KPI alignment, cross-project harmonization, white papers and public recommendations

5.2.4 Standardization timeline

Alignment and gap analysis (From project start up to D7.2)

Main goal: Monitored SDOs and prepared contribution packages, as presented above.

Actions:

1. Build an internal standardization radar covering 3GPP, O-RAN, ETSI, ITU-T, IETF/IRTF, IEEE, CAMARA and SNS/6G-IA.
2. Map each technical result to a standardization venue.
3. Prepare short gap-analysis documents:
    a. AI-native integrated SBA gaps.
    b. dApps vs xApps/rApps gaps.
    c. Distributed MLOps gaps.
    d. Digital twin validation gaps.
    e. Semantic-aware API gaps.
4. Sustainability KPI gaps.

Contribution development and PoC-backed proposals (M18 to M30)

Main goal: submit concrete technical contributions.

Actions:

1. Submit architectural requirements to ITU-T FG-AINN, ETSI ENI/ZSM and 3GPP SA5.
2. Use O-RAN to push dApp and AI/ML lifecycle concepts.
3. Use CAMARA/GSMA/OPENCAPIF for network exposure and semantic APIs.
4. Use SNS TMV WG to align KPIs, datasets, and test methodology.

5. Use IEEE/IETF for multi-RAT NPN, deterministic networking, transport telemetry, and green networking.

PoC validation and standardization consolidation (M30 to M36 / D7.3)

Main goal: convert project results into reusable standardization assets.

Actions:

1. Package final PoC results as:
    f. Reference architecture.
    g. API specifications.
    h. KPI methodology.
    i. Dataset and telemetry recommendations.
    j. Lessons learned for AI-native management.
2. Submit final recommendations to SDOs and SNS/6G-IA.
3. Prepare post-project exploitation paths through partners already active in SDOs.
4. Promote open-source or open API assets where possible, especially for PoC reuse.

UNITY-6G's standardization roadmap will evolve from awareness and monitoring toward coordinated, PoC-driven contributions that promote a sustainable, scalable and AI-native integrated 6G architecture. The project will prioritize the standardization of distributed AI-native management, cross-domain SBA, dApps for real-time Open RAN control, MLOps for trustworthy and sustainable AI lifecycle management, digital twin-based validation, semantic-aware network exposure, and TN/NTN/xHaul/NPN interoperability. Contributions will be directed to the most relevant SDOs and pre-standardization communities, including 3GPP, O-RAN Alliance, ETSI ENI/ZSM/MEC/OPENCAPIF, ITU-T FG-AINN, IETF/IRTF, IEEE, CAMARA, GSMA, ESA-ALIX, SNS JU and 6G-IA. The roadmap will be evidence-based: early phases will focus on requirements and gap analysis, intermediate phases on technical contributions and API/KPI definitions, and the final phase on PoC-backed recommendations, reusable datasets, validation methodologies and post-project exploitation paths.

5.3 UPDATED EXPLOITATION STRATEGY

Building on the exploitation activities and outcomes achieved during M1-M18 (reported in Section 4), the updated exploitation strategy for M19-M36 aims to transition from KER identification and positioning to structured and actionable exploitation pathways. Through this strategy, UNITY-6G will consolidate the insights derived from the Intermediate Application Analysis Report, maturate the KERs identified during M1-M18, and leverage the feedback obtained through the EC Booster program. Ultimately, this will maximize both commercial uptake and long-term academic and technological legacy.

In this context, the exploitation strategy presented here complements the scientific and standardization-oriented pathways described in Sections 5.1 and 5.2. Specifically, while these sections focus on influencing research directions, contributing to SDOs and shaping the future

6G ecosystem, the exploitation strategy presented here focuses on translating project outcomes into tangible assets, services, and solutions that can be adopted by industry, integrated into products, or further developed in post-project initiatives.

The exploitation approach is structured around the progressive consolidation and valorization of the UNITY-6G KER portfolio. Building on the identification and initial characterization performed during M1–M18, the consortium will refine the KERs along several dimensions, including ownership, maturity level, market relevance, and potential exploitation routes. To ensure effective exploitation, each KER will be associated with a clearly defined value proposition and mapped to target stakeholders, including network operators, equipment vendors, vertical industries, standardization bodies, and the research community. This mapping will consider different exploitation routes, such as:

- Commercialization and product integration, particularly for industrial partners aiming to incorporate UNITY-6G innovations into existing or future product portfolios.
- Intellectual property protection and licensing, including patenting of selected innovations and potential licensing agreements.
- Open-source release and community-driven development, supporting ecosystem uptake and accelerating innovation.
- Follow-up research and innovation projects, enabling further maturation and extension of project results.
- Standardization contributions, ensuring alignment between exploitation and long-term ecosystem adoption.

In parallel, the exploitation strategy places strong emphasis on the integration of technical validation results and large-scale demonstrations as key enablers for market readiness. The validation activities conducted within UNITY-6G, such as the proof-of-concept implementations, provide critical evidence of feasibility. These results will be leveraged to strengthen the credibility of KERs and support the transition from experimental prototypes to deployable solutions. The role of the EC Booster program will be central in this phase, providing structured methodological support to refine exploitation plans, strengthen value propositions, and identify viable market entry strategies. In particular, the program will support partners in developing more concrete and actionable exploitation roadmaps, including stakeholder engagement strategies, competitive positioning, and identification of potential barriers to adoption.

From an academic perspective, the exploitation strategy will continue to ensure a strong knowledge transfer and scientific legacy, through publications, datasets, open-source tools, and contributions to future research agendas. These activities will guarantee the long-term accessibility and reuse of UNITY-6G results, fostering continued innovation beyond the project duration and reinforcing the project's impact within the global 6G research community.

Innovations	Leading partners	Potential exploitation pathways
Trustworthy cross-domain service orchestration for future networks	CTTC	• IP protection & patenting following internal evaluation process • Standardization contributions (e.g., ITU-T FG-AINN, ETSI ENI/ZSM, 3GPP SA5) to embed trust-aware orchestration principles • Integration into research prototypes and open-source frameworks to demonstrate feasibility • Follow-up R&I projects targeting AI-native and secure orchestration • Potential technology transfer to industry partners (operators, vendors) for adoption in network management platforms
Scheduling mechanism in wireless time sensitive networking related to utilization of short time slots	IMEC	• Patent filing • Standardization contributions toward IEEE 802.11 (WNG), deterministic wireless / TSN evolution • Integration into IMEC research platforms and testbeds (openwifi / W-TSN) • Industrial affiliation programs and bilateral projects to transfer technology to industry • Licensing opportunities toward vendors developing deterministic wireless solution
O-RAN enabled IEEE 802.11 access points (APs)	IMEC	• Product-oriented integration into future multi-RAT and O-RAN-compliant solutions • Standardization contributions (O-RAN Alliance, IEEE 802.11, ETSI) for multi-RAT control and interoperability • Open-source extensions (e.g., openwifi) to accelerate ecosystem uptake • Industrial exploitation via partnerships and licensing, especially for Industry 4.0 and private networks • EC Booster-supported go-to-market strategy (value proposition, stakeholder targeting)
Inter-Domain Manager and Orchestrator (IDMO) Implementation	PUT	Several potential exploitation paths, with either a purely commercial approach, or an open-source release featuring the basic functionality, and a fully-fledged implementation for commercialization. Specifically: • Commercialization through integration into orchestration platforms (e.g., O-RAN / cloud-edge orchestration) • Standardization contributions (ETSI ZSM, O-RAN, TM Forum) for multi-domain orchestration • EC Booster support for go-to-market and stakeholder engagement • Follow-up research projects and academic exploitation

Overall, the updated exploitation strategy for M19–M36 reflects a shift toward impact realization and sustainability, where technical excellence, standardization influence, and market-oriented exploitation are jointly leveraged. By ensuring a tight coupling between KER development, validation, standardization activities, and market needs, UNITY-6G aims to maximize the adoption potential of its results and contribute effectively to the evolution of a sustainable, scalable, and AI-native 6G ecosystem.

6 IMPACT ASSESSMENT (KPI TRACKING)

To ensure UNITY-6G delivers a lasting legacy within the 6G landscape and beyond, the consortium follows a rigorous impact-oriented monitoring framework. This section assesses the effectiveness of the project's outreach and impact creation strategy by tracking a comprehensive set of Impact Creation KPIs.

The following evaluation provides a quantitative and qualitative look at how the project has successfully generated visibility, fostered knowledge transfer, and contributed to the 6G ecosystem. By monitoring metrics across digital presence, scientific excellence, and standardization activities, we ensure that UNITY-6G's innovations are not only developed but also widely adopted and recognized.

The table below details the project's performance against the strategic targets outlined in Deliverable D7.1 *Dissemination, Standardization, and Exploitation Plan*[6].

Table 9: Key performance indicators for UNITY-6G dissemination, communication and exploitation activities.

Measure	Indicator	Target	M18 (June 2026)
Project Website	No. of unique visitors to the website (average per year)	>1,500	4,061
Social Networks	No. of followers on LinkedIn	>150	513
Social Networks	No. of followers on Bluesky	>150	16
Press Releases / Publications in Press	No. of press releases issued to specialized and general media channels at key project milestones	>2	1
Promotional Materials	Roll-ups produced	>2	1
	Flyers/Brochures produced	>2	3
Publications	No. of peer-reviewed publications in journals, conferences and workshops	>8 per year	52
e-Newsletter	No. of newsletters published	6	2
	No. of subscribers	>100	103
Videos	No. of videos published on the YouTube channel	>4	8

[6] https://unity-6g.eu/wp-content/uploads/2025/04/UNITY-6G_D7.1.pdf

Workshops / Demonstrations	No. of organized events	2 workshops; 1 demonstration/year	16
	Average number of participants per workshop	>30	30
Participation in Events and Presentations	No. of external events attended to promote the project	≥5 events	50+
	No. of demonstrations and/or presentations	>3 demos	6
Open-source Contributions	No. of contributions to open-source initiatives	5	2

The communication, dissemination, standardization, and exploitation activities have progressed very positively during the first 18 months of the project, with the majority of key performance indicators already meeting or exceeding their targets. The project website significantly outperformed expectations, attracting 4,061 visitors against a target of 1,500 annual visitors, while the LinkedIn channel grew to 513 followers, more than three times the target of 150 followers. Scientific dissemination has been particularly strong, with 52 peer-reviewed publications produced by M18, substantially exceeding the target of eight publications per year. The project also met its target of 103 newsletter subscribers and exceeded the target for video production with eight videos published.

Engagement with the wider research and innovation ecosystem has also been highly successful. Consortium partners participated in 47 external events, far exceeding the target of five events, while the project organized 16 workshops, demonstrations and related dissemination activities, well above the planned target. Some indicators, including the number of press releases, promotional roll-ups and newsletter editions, are still below their final targets; however, these activities are planned to intensify during the second half of the project as technical results mature and large-scale demonstrations are completed. Overall, the KPI results indicate that UNITY-6G has established a strong presence within the European 6G landscape and is well positioned to achieve or surpass its communication and dissemination objectives by the end of the project.

This tracking ensures we remain agile, allowing the consortium to intensify activities in specific channels if needed to maximize the project's reach before its conclusion.

7 CONCLUSIONS

Deliverable D7.2 provides a comprehensive intermediate review and formal evaluation of UNITY-6G's dissemination, communication, standardization, and exploitation activities during the first half of the project lifecycle (M1–M18). By measuring the consortium's collective outputs against the strategic targets established in D7.1 *Dissemination, Standardization, and Exploitation Plan*[7], this report confirms that the project has built a remarkably robust foundation for long-term impact creation.

The quantitative assessment reveals that the majority of key performance indicators have already met or significantly exceeded their initial target values. The digital presence of the project has flourished, with the official website attracting 4,061 unique visitors and the LinkedIn professional channel expanding to over 500 followers. Scientific dissemination has demonstrated exceptional performance, yielding 52 peer-reviewed papers published in top-tier international journals and major IEEE conferences, far eclipsing the initial target. Similarly, engagement with the broader research and industrial ecosystem has been highly successful, as evidenced by partner attendance at external events and the organization of multiple dedicated workshops, demos, and technical special sessions.

On the technical and regulatory front, the consortium has successfully transitioned from passive monitoring of SDOs to active, contribution-driven engagement. Partners have pushed the core UNITY-6G vision of an AI-native, sustainable, and service-based architecture into priority workstreams within 3GPP SA5, the O-RAN Alliance, ETSI ZSM/ENI, and ITU-T FG-AINN. In parallel, exploitation mechanisms have advanced significantly; two distinct hardware/software innovations have been funneled into internal patent evaluation processes, open-source codebases have been enriched through the Linux Foundation's OCUDU project, and the consortium's onboarding into the EC's Booster program ensures a commercialization pathways for the selected project's KERs.

As the project transitions into its final 18 months (M19–M36), the strategic focus shifts from establishing awareness to scaling wide outreach, validating integrated prototypes, and driving the concrete adoption of project results.

[7] https://unity-6g.eu/wp-content/uploads/2025/04/UNITY-6G_D7.1.pdf