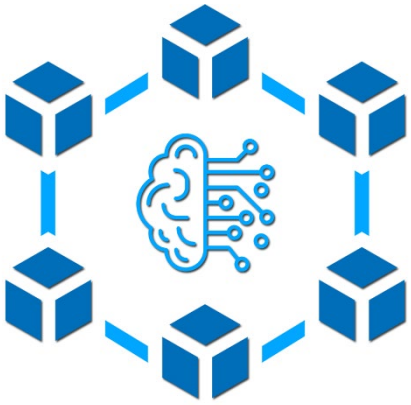

An Artificial Intelligent Aided Unified Network for Secure Beyond 5G Long Term Evolution [GA: 101096456]

Deliverable 1.10

Final Standardisation Activities Report

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Name	Organisation	Date
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List of Acronyms

Acronym	Explanation
6G	Sixth-Generation
AI	Artificial Intelligence
B5G	Beyond Fifth-Generation
B-RAN	Blockchain-based Radio Access Network
E2E	End-to-End
ER	Exploitable Result
FL	Federated Learning
GA	Grant Agreement
MANO	Management and Orchestration
MEC	Multi-access Edge Computing
MIMO	Multiple-Input Multiple-Output
ML	Machine Learning
MNO	Mobile Network Operator
PQC	Post-Quantum Cryptography
QKD	Quantum Key Distribution
RAN	Radio Access Network
SDN	Software Defined Networking
SDO	Standards Development Organisation
SSI	Self-Sovereign Identity
VNF	Virtualized Network Function

Executive summary

The NANCY project is a pioneering effort to reshape wireless communication by integrating blockchain, artificial intelligence (AI), and multi-access edge computing (MEC) into beyond-fifth-generation (B5G) systems.

D1.10 'Final Standardisation Activities Report' lays down the activities from Task 1.6 'Standardisation & Clustering Activities' as reported at the end of the project. A first version of the deliverable, namely D1.7 'Initial Standardisation Activities Report', was delivered in M20 – June 2024.

This report aims to provide a comprehensive overview of the standardisation activities and future envisioned efforts associated with the project. The document will first introduce an overview of the project's main results. Then, based on the identified list of Standards and Industry Fora as presented in the D1.7 'Initial Standardisation Activities Report', the project's results are aligned and reported to the selected standard bodies.

Based on the roadmap overview presented in D1.7 'Initial Standardisation Activities Report', this report outlines how the project implemented the strategic approach to standardisation activities, highlighting our achievements and contributions to open-source initiatives and collaboration with renowned bodies in the field.

1. Introduction

1.1. Purpose of Deliverable

NANCY's core goals guide its standardisation work by targeting key challenges in next-generation wireless communications. The project aims to build a secure, intelligent B5G network architecture by integrating advanced technologies such as high-security blockchain, AI, and multi-access edge computing to deliver efficient, adaptive, and continuously protected connectivity. To meet these goals, the consortium has prioritised major challenges, including supporting heterogeneous networks, enabling dynamic scalability, establishing AI-driven Blockchain-based Radio Access Network (B-RAN) frameworks, adopting post-quantum cryptography, lowering total ownership costs, and defining a new business model for commercialising B-RAN.

Expanding on D1.7 'Initial Standardisation Activities Report', this deliverable reviews the project's standardization efforts and future goals. Also, it maps project outcomes to relevant industry standards and documents our collaborations with major global organizations. Based on the description of work in the Grant Agreement, Table 1 shows the achieved results for each of the NANCY Pillars as reported in the initial deliverable D1.7 'Initial Standardisation Activities Report'.

Table 1: NANCY Results

NANCY Results	
Pillar I	[R1] B-RAN architecture
	[R2] Novel trustworthy grant/cell-free cooperative access mechanisms
	[R3] A novel security and privacy toolbox that contains lightweight consensus mechanisms, and decentralized blockchain components
	[R4] Realistic blockchain and attacks models and an experimental validated B-RAN theoretical framework
	[R5] A novel Quantum safety mechanisms to boost end-user privacy
	[R6] Smart pricing policies
Pillar II	[R7] AI-based B-RAN orchestration with slicer instantiator
	[R8] A novel AI virtualiser for underutilized computational & communication resource exploitation
	[R9] Novel self-evolving AI model repository
	[R10] Experimentally driven reinforcement learning optimization of BRAN
	[R11] Semantic & goal-oriented communication schemes for beyond Shannon excellence
	[R12] An explainable AI framework
Pillar III	[R13] Next-generation SDN-enabled MEC for autonomous anomaly detection, self-healing and self-recovery
	[R14] A computational aware/provision scaling mechanisms and novel battery as well as computational capabilities aware offloading policies
	[R15] User-centric caching mechanisms

1.2. Relation to Other Tasks and Deliverables

The deliverable relates to technical tasks, as it consolidates the standardization activities based on the research and development work carried out throughout the duration of the project. This deliverable constitutes the updated version of D1.7 'Initial Standardisation Activities Report' that was delivered in M20 – June 2024.

1.3. Structure of the Deliverable

The deliverable is organized as follows:

- **Section 1 - Introduction** presents the deliverable purpose, its relationships with other tasks and deliverables, and the structure.
- **Section 2 - Identification of Standards and Industry Fora** provides a list of the standards that are related to the NANCY activities.
- **Section 3 – Identified Initiatives and Contributions** summarizes the standardization initiatives and contributions.
- **Section 4 – Progress and Achievements** provides an overview of standardization progress and highlights the achievements or contributions made by the project partners.
- **Section 5 – Future Roadmap** presents the future activities of the consortium in relation to the aforementioned initiatives.

2. Identification of Standards and Industry Fora

2.1. Identified Organisations

The consortium acknowledges the importance of active collaboration with key Standards Development Organisations (SDOs) and industry fora to ensure the successful integration and acceptance of our innovations within the wireless communication landscape. The selection of these organisations has been illustrated in the initial deliverable D1.7 'Initial Standardisation Activities Report'.

2.2. Contribution to Project Results

Each organisation was chosen based on its potential contribution to specific aspects of our project. Table 2 shows the contributions from each organization in the project to achieve the specified project results.

Table 2: Contribution to Project Results

Selected Organisation	Identified Standards / Open-Source initiatives	Contribution to Project Results	Lead Partner
3GPP	3GPP's work is organized into "Releases" with each Release containing a set of specifications that define new features and enhancements. Working groups (WGs) contribute to these Releases by drafting, reviewing, and finalizing the specifications. These WGs operate under the guidance of Technical Specification Groups (TSGs). All the TSGs and corresponding contributions are of interest to the project: • TSG RAN (Radio Access Network): Focuses on the radio aspects of the mobile network. • TSG SA (Service and System Aspects): Deals with the overall system architecture and service requirements. • TSG CT (Core Network and Terminals): Concentrates on the core network and terminal aspects.	[R1] B-RAN architecture [R2] Novel trustworthy grant/cell-free cooperative access mechanisms [R3] A novel security and privacy toolbox that contains lightweight consensus mechanisms, and decentralized blockchain components [R7] AI-based B-RAN orchestration with slicer instantiator [R9] Novel self-evolving AI model repository [R10] Experimentally-driven reinforcement learning optimization of B-RAN [R13] Next-generation SDN-enabled MEC for autonomous anomaly detection, self-healing and self-recovery	TEI
IEEE	IEEE 802.11 (WiFi) IEEE P3201- IEEE Draft Standard for Blockchain Access Control The standard establishes access control requirements for blockchain systems	[R1] B-RAN architecture [R2] Novel trustworthy grant/cell-free cooperative access mechanisms	CERTH, INNO

	and specifies the access control attributes. Specifically, it covers node permissions, such as the ability to generate, verify, and synchronize blocks or send transactions. Moreover, it addresses smart contract access, including interface and hybrid controls. Also, it focuses on user permissions; registered users are assigned roles that dictate their specific privileges. Finally, it defines global permissions, such as who is authorized to read or deploy smart contracts.	[R3] A novel security and privacy toolbox that contains lightweight consensus mechanisms, and decentralized blockchain components [R4] Realistic blockchain and attacks models and an experimental validated B-RAN theoretical framework [R11] Semantic & goal-oriented communications	
NGMN	Driving Open Disaggregation & Cloud-Native Innovation	[R1] B-RAN architecture	TEI
IETF	ACE Working Group	[R2] Novel trustworthy grant/cell-free cooperative access mechanisms	UMU
ONF	SD-RAN advances the mobile ecosystem by developing and testing open-source software that aligns with O-RAN principles. While O-RAN focuses on defining architecture and interfaces, SD-RAN complements this work by developing the components. This synergy enables true multi-vendor solutions and accelerates innovation across the RAN ecosystem.	[R1] B-RAN architecture [R12] An explainable AI framework [R13]: Next-generation SDN-enabled MEC for autonomous anomaly detection, self-healing and self-recovery	UOWM
ISO / JAVACARD / GLOBALPLATFORM	• ISO/IEC JTC 1/SC 17/WG 4: Generic Interfaces and Protocols for Security Devices • Javacard Forum - Technical Committee Key Agility • Global Platform - Creating new agile protocols in preparation for future post-quantum migration	[R5] A novel Quantum safety mechanisms to boost end-user privacy	TDIS
WWRF	WWRF publishes several whitepapers focused on wireless communication technologies. Also, several working groups have been established, covering a wide range of topics (e.g., architecture, vehicle communications, radio technologies, cybersecurity, etc.). Of particular interest to NANCY are the following WWRF WGs: • Communication Architectures and Technologies • Radio Communication Technologies • Cybersecurity	[R1] B-RAN architecture [R12] An explainable AI framework [R14] A computational aware/provision scaling mechanisms and novel battery as well as computational capabilities aware offloading policies	UOWM

O-RAN	O-RAN is the key enabler for RAN sharing and is focused on accelerating the integration of intelligence, openness into RAN management, while incorporating AI capabilities, in future communications. The NANCY project integrates blockchain and smart contract mechanisms directly into the O-RAN Medium Access Control (MAC) layer to establish an immutable and auditable ledger. Furthermore, this architecture facilitates Blockchain-enabled RAN (B-RAN), allowing operators to dynamically sublease infrastructure, thereby optimizing resource utilization and extending 5G coverage through secure sharing models.	[R1] B-RAN architecture	OTE
OSM	Integrating AI and Explainable AI (XAI) as Virtualized Network Functions (VNFs) within the Open-Source MANO (OSM) framework is essential for enhancing the capabilities of modern wireless networks. In particular, AI-driven VNFs can significantly improve network performance, operational efficiency, and user experience, while XAI VNFs have the potential to add a layer of transparency, and interpretability in order to help the operators understand the decision-making processes of AI models, thereby fostering trust and compliance with national and EU regulations. This integration will provide clear, interpretable insights into AI-driven operations, making OSM a transparent and privacy-preserving framework.	[R12] An Explainable AI Framework	MINDS
SNS JU	Strengthen Europe's position as a technological leader in future smart networks and services by enhancing existing industrial capabilities and expanding the focus beyond 5G connectivity to include the full strategic value chain, encompassing cloud-based service provisioning, components, and devices. Harmonize the strategic plans of many industrial participants, encompassing not just the telecommunication sector, but also entities from the Internet of	[R1] B-RAN architecture [R6] Smart pricing policies [R14] A computational aware/provision scaling mechanisms and novel battery as well as computational capabilities aware offloading policies	8BELLS

	Things, cloud computing, and components and devices. Accelerate the development of European technological and scientific expertise in order to establish European dominance in the design and control of 6G systems by the year 2030. Enhance the implementation and adoption of digital infrastructures and solutions in the European markets, specifically by establishing a strategic coordination mechanism for the CEF2 Digital program and promoting collaboration between CEF2, DEP, and InvestEU. Equip the European smart networks and services supplier business to capitalize on the future prospects arising from the advancement of vertical markets for 5G and subsequent 6G infrastructures and services in Europe; By 2030, aim to promote digital innovation that caters to the specific demands of the European market and public policies. This includes addressing the high standards set by various businesses and satisfying societal needs in areas like security, energy efficiency, and electromagnetic fields. Ensure that future smart networks and services are in line with Union policy objectives, such as the European Green Deal, information and network and information privacy, security, and, and a sustainable human-centric internet.		
One6G	An overview of the key enabling technologies that constitute the pillars for the evolution towards 6G is investigated. They include Terahertz frequencies, 6G radio access, next generation MIMO, integrated sensing and communication, non-terrestrial networks, multimodal sensing, computing, communication and control for 6G remote operation, distributed and federated artificial intelligence, intelligent user plane and	All	INNO

	flexible programmable infrastructures. The key problems and difficulties are outlined, and a comprehensive overview of the state of the art in that technology is given.		
ECO6G	Driven by the conviction that a collaborative effort is essential to define the vision and research priorities for 6G, ECO6G provides a platform for policymakers, program leaders, industry representatives, and leading academic stakeholders to examine the significant actions and initiatives associated with this emerging connectivity paradigm. ECO6G is an initiative of the i2CAT foundation.	Contribution to knowledge sharing, Co-creation of white papers, Keynotes & presentations	i2CAT
BDVA/DAIRO	GenAI Task Force	[R9] Novel self-evolving AI model repository [R12] An explainable AI framework	INTRA
NIST/PQC	NIST standardisation process of Post-quantum cryptography. NIST has asked for a 4th round selection of PQ algorithms on top of the already selected algorithms during round 3	[R5] A novel Quantum safety mechanisms to boost end-user privacy	TDIS
ETSI PDL	ETSI ISG PDL	[R3] A novel security and privacy toolbox that contains lightweight consensus mechanisms, and decentralized blockchain components	NEC
W3C	Verifiable Credentials Data Model v2.0	[R3] A novel security and privacy toolbox that contains lightweight consensus mechanisms, and decentralized blockchain components	NEC

2.3. Global Reach and Influence

The organisations presented in Table 3 have a global reach and influence, providing our project with a platform to contribute to and benefit from a diverse range of perspectives. This global collaboration is essential for the widespread adoption of our innovations.

Table 3: Global Reach of Influence

Selected Organisation	Global Reach and Influence	Lead Partner
3GPP	The 3rd Generation Partnership Project (3GPP) plays a pivotal role in the global telecommunications industry by developing protocols for mobile	TEI

	telephony. Its influence extends across various aspects of wireless communication, including network infrastructure, user equipment, and service capabilities. 3GPP's global reach is evidenced by its comprehensive membership, which includes telecommunications standards organizations from Europe, North America, Asia, and beyond. This broad participation ensures that the standards developed by 3GPP are globally applicable and widely adopted. 3GPP's specifications form the backbone of numerous mobile technologies, from 2G to 5G, as well as in the development of 6G. These standards facilitate interoperability between devices and networks from different manufacturers and operators worldwide, enabling seamless global communication. Additionally, 3GPP's work on 5G standards has positioned it as a leader in the next-generation mobile network revolution, influencing not only telecommunications but also industries such as automotive, healthcare, and IoT (Internet of Things).	
IEEE	IEEE is a vast community consisting of more than 450000 technology and engineering professionals united by a common desire to continuously learn, interact, collaborate, and innovate. As one of the organisation's highest priorities is the sharing of cutting-edge content for all of the technical fields of interest within IEEE, it sponsors over 2000 annual conferences and events worldwide and provides a wide range of quality publications that make the exchange of technical knowledge and information possible among technology professionals. Furthermore, IEEE facilitates engagement with a diverse network of technical and local communities, driving critical discussions on technical issues at a global level.	CERTH, INNO
NGMN	The NGMN Alliance consists of Member, Contributor, and Advisor Partners. Member Partners are Operators with over 200 networks serving more than 60 % of all global customers. Several industry standard bodies, groups, and the NGMN Alliance work closely together to attain the goal of a coherent vision for the mobile evolution.	TEI
IETF	In-person participation at IETF meetings now averages between 1000 and 1500 participants, with hundreds of additional participants joining remotely. These meetings rotate around the globe. In any one year, over 7000 people actively participate in the IETF either by authoring a document, engaging in a mailing list discussion, or attending a meeting. The work of the IETF is to produce technical documents (RFCs) that define how Internet technology works in detail and can be operated and managed at scale. The majority of the IETF's work is done in WGs.	UMU
ONF	ONF includes worldwide members like Cisco, Dell, Google, Microsoft, different international operators, and many universities. ONF was instantiated in 2011, and its community standardised the OpenFlow protocol. As of today, and now that ONF's platforms have been proven and are being deployed worldwide, ONF is focused on expanding adoption and building developer communities.	UOWM
ISO / JAVACARD / GLOBALPLATFORM	The global influence of standards organizations like ISO, Javacard, and Global Platform is vital for ensuring the security and interoperability of integrated circuit devices. ISO sets international standards for secure integrated circuits, ensuring consistency and trust across devices and applications worldwide. Javacard focuses on smart card technology,	TDIS

	providing specifications for secure and interoperable smart card platforms. Meanwhile, Global Platform defines specifications for secure element management, promoting interoperability among different integrated circuit devices. By adhering to these standards, our project ensures compatibility with existing secure integrated circuit devices, facilitating seamless integration into the global wireless communication ecosystem.	
WWRF	WWRF has a global outreach, and its members include telecommunications operators, network equipment manufacturers, universities, and research institutes. Furthermore, WWRF organizes several physical meetings each year, enabling stakeholders and experts to meet and disseminate the latest research trends. Additionally, WWRF hosts multiple workshops, events, and online seminars focused on particular topics. Finally, the outcomes of WWRF involve whitepapers and special issues, summarizing the results that were presented in the WWRF meetings.	UOWM
O-RAN	O-RAN ALLIANCE's target goal is to reshape the RAN industry towards more intelligent, open, virtualized, and fully interoperable mobile networks. O-RAN specifications enable a more competitive and vibrant RAN supplier ecosystem with faster innovation to improve user experience. More specifically, ORAN aims to change the confidential nature of the RAN market, providing a more flexible and interoperable architecture. The O-RAN architecture launched by several alliances of MNOs, equipment vendors, academia, legislators, and policy-makers is focused on disaggregation and open interfaces, creating a multi-vendor ecosystem that promotes innovation. ORAN use cases aim to leverage faster innovation and greater flexibility in B5G networks. Induced by virtualization and software defined networking (SDN), the boost in the use of ORAN in 5G deployment. Spurred by virtualization of 5G networks and the advent of SDN they have proliferated the use of ORAN in 5G deployment.	OTE
OSM	Currently, there are 43 registered members and 110 participants in OSM, spanning from universities, large companies, key industry players, and SMEs. Due to the progressively increased popularity of ETSI, OSM is constantly growing in participants and registered members, and, thus, the releases and improvements of its Open-source MANO framework and the corresponding architectural design are significantly influenced by the market, aiming to close the gap between the industry and research.	MINDS
SNS JU	The objective is to drive the development of cutting-edge communication technologies that address evolving connectivity needs, while simultaneously cementing European leadership in the transition toward 6G. This initiative prioritizes securing a dominant European influence in the global landscape by establishing robust standards, capturing essential patents, and defining critical requirements—such as spectrum allocation—that are fundamental to the future of smart network infrastructure. Expeditiously advance the progress of energy-efficient network technologies with the objective of substantially diminishing the energy and resource usage of the entire digital infrastructure by 2030, while also reducing the energy consumption of key vertical industries that are supported by smart networks and services technologies. Facilitate the	8BELLS

	rapid advancement and extensive implementation of 5G technology by the year 2025, and subsequently, the establishment of 6G infrastructure in Europe. This will be achieved by actively encouraging the coordination and strategic assistance for the deployment of 5G technology in the context of Connected and Automated Mobility across international borders. The CEF2 Digital programme will be utilized, and deployment will be promoted under CEF2, DEP, and InvestEU initiatives. Promote the development of a resilient and varied supply and value chain that aligns with the 5G Cybersecurity toolkit. Enhance the Union's industry's position in the global smart network and services value chain by establishing a significant number of public and private participants, specifically by increasing the involvement of software and Internet of Things actors. This will be achieved by leveraging national initiatives and fostering an environment that encourages new market entrants. By embedding ethical and security standards directly into Strategic Research and Innovation Agendas—and engaging with the Union's legislative process when required—we ensure that all advancements remain compliant with essential regulatory and safety frameworks	
One6G	The one6G WG brings together top experts from governments, industry, and academia to foster an ongoing discussion on issues related to 6G. Their work is dedicated to/focuses on: (i) WG1: Use cases, KPIs, and future market and business scenarios; (ii) WG2: Enabling technologies and system architecture; (iii) WG3: Communication and dissemination; (iv) WG4: Evaluation, testbeds, and pilots.	INNO
ECO6G	Throughout a series of discussions, ECO6G provides a platform for policymakers, program leaders, industry representatives, and prominent academic figures to examine the significant initiatives and advancements within the 6G connectivity framework.	I2CAT
BDVA/DAIRO	The influence of DAIRO is evidenced by having over 240 members all over Europe and a well-balanced composition of large, small, and medium-sized industries, as well as research and user organisations. Founded in 2014, the Association originated as the private sector partner to the European Commission within the Big Data Value Public Private Partnership. Since its inception, it has extended its influence beyond the Partnership, playing a pivotal role in shaping EU-level research and innovation roadmaps. The Association serves as a hub for knowledge exchange regarding Big Data, Data Value, and AI. Big Data Value Public Private Partnership is a private member of the EuroHPC JU and is also one of the founding members of the AI, Data, and Robotics Partnership.	INTRA
NIST/PQC	Adhering to NIST's selection of Post-Quantum Cryptography (PQC) is crucial for ensuring the long-term security of wireless communication systems. NIST's rigorous evaluation process and global consensus-building guarantee the credibility of selected PQC standards. By aligning with NIST's recommendations, our project ensures compatibility with emerging global cryptographic standards, safeguarding networks against quantum threats while enhancing interoperability and trust across industries and jurisdictions.	TDIS
ETSI PDL	The European Telecommunications Standards Institute (ETSI) offers a platform for defining and testing globally applicable ICT standards. By engaging with ETSI's network—which spans five continents and includes the forefront of emerging technologies—this project will ensure its	NEC

	technological outputs are timely, interoperable, and ready for adoption in diverse industrial applications.	
W3C	Web inventor Tim Berners-Lee founded the World Wide Web Consortium in 1994 to ensure the long-term growth of the Web. W3C's strategic goals are: • Ensure that the evolving web platform and Web technologies improve in integrity, security, and privacy. • Develop flexible web architecture to enable businesses and individuals to meet changing customer demands. • Ensure efforts on accessibility and internationalization continue to achieve the goal of a web for everyone. • Boost the incubation of emerging technologies by organizing it better and fostering better consensus-building among important players. • Achieve worldwide participation, diversity, and inclusion, establishing W3C as a representative of the worldwide community. • Establish and improve collaborative relationships with other organizations in the domain of Internet and web standards.. • Foster the involvement of under-represented key stakeholders such as end users, content creators, developers, etc.	NEC

3. Identified Initiatives and Contributions

As a follow-up to the initiatives described in D1.7 'Initial Standardisation Activities Report' and by considering activities carried out during the project lifetime, Table 4 details the contributions to each initiative and the involvement of project partners.

Table 4: Initiatives and Contributions

Selected Organisation	Identified Standards / Open-Source Initiatives	Contributions	Lead Partner
3GPP	Standards related to the following Technical Specification Groups: • TSG RAN (Radio Access Network) • TSG SA (Service and System Aspects) • TSG CT (Core Network and Terminals)	Monitoring activities of the identified standards.	TEI
IEEE	• IEEE 802.11 (WiFi) • P3201	The two prediction tools by CERTH, for throughput and outage probability, assume the availability of link quality and traffic load indices at the AP/base station side and/or UE side. Whereas specific radio resource management algorithms are typically outside the scope of standards, CERTH is monitoring the standardisation activities of the IEEE802.11 groups to ensure that adequate provision for such measurements is made in their standardisation work so that the prediction tools are compatible with the standard. INNO is monitoring the results of P3201 and IEEE Blockchain TC and aligns the development within NANCY with the standards. INNO participated in P3201 and IEEE Blockchain TC, providing information related to the NANCY network architecture, the blockchain role, and contributing to specification and requirements definition. Moreover, INNO used P3201 and IEEE Blockchain TC as the baseline for the definition of NANCY components.	CERTH, INNO

NGMN	Mastering the route to Disaggregation	Monitoring activities of the proposed initiative.	TEI
IETF	ACE Working Group	The ACE WG focuses on standardized solutions for authentication and authorization to enable authorized access to resources identified by a URI in constrained environments. UMU participates in this WG and has proposed an Internet-Draft document.	UMU
ONF	SD-RAN	UOWM is monitoring the activities concerning the SD-RAN which has now moved to the Linux Foundation under the Aether project umbrella. A second testbed is being deployed, leveraging the components of the Aether project.	UOWM
ISO	ISO/IEC JTC 1/SC 17/WG 4: • ISO/IEC 7816-8 new Ad Hoc workgroup on crypto Agility	New Ad Hoc group created to work on a new agility enabling approach for hybrid certificate parsing by ICC. TDIS leads this ad hoc group	TDIS
	ISO/IEC JTC 1/SC 17/WG 4: • 7816-6:2023/AWI Amd 1: Interindustry data elements for interchange – PQC	ISO/IEC 7816-6 new Ad Hoc workgroup on PQC. TDIS leads this ad hoc group.	TDIS
	ISO/IEC JTC 1/SC 17/WG 4: • 7816-9:2017/AWI Amd 1: Commands for card management - PQC	ISO/IEC 7816-9 new Ad Hoc workgroup on PQC. TDIS leads this ad hoc group.	TDIS
Java Card	Javacard Forum - Technical Committee Key Agility	Introduction of Crypto agility: Ready for any type of key (legacy algorithms: Asymmetric and symmetric (RSA/ECC/HMAC/AES…), support of DES/3DES, introduction of NIST selected PQC algorithms (Dilithium, Falcon, Sphincs+, Kyber)	TDIS
Global Platform	Global Platform - Creating new agile protocols in preparation for future post-quantum migration	Specification Workgroup to extend existing specifications to support PQC algorithms.	TDIS
WWRF	WWRF publishes several whitepapers focused on wireless communication technologies. Also, several WGs have been established, covering a wide range	UOWM is monitoring the activities of WWRF and its WGs. Also, UOWM is in communication with the WWRF organizers and chairs in order to	UOWM

	of topics (e.g., architecture, vehicle communications, radio technologies, cybersecurity, etc.).	present the key outcomes in a future WWRF meeting.	
O-RAN	ORAN alliance has published several reports regarding to future ORAN 6G architecture. The O-RAN.WG1.OAD-R003-v12.00 describes all O-RAN architecture elements and relevant interfaces that connect them .	Monitoring activities.	OTE
OSM	Open Source NFV Management and Orchestration (MANO) software stack	MINDS has maintained participation in the OSM community, monitoring release cycles. Also has partially evaluated OSM's architectural patterns for MANO orchestration in the context of NANCY's AI-based B-RAN orchestration requirements (ER7 and ER12). MINDS has engaged with OSM documentation and technical specifications to ensure alignment between NANCY's explainable AI framework and OSM's NFV orchestration capabilities.	MINDS
SNS JU	Encourage Europe to maintain its position as a global leader in smart network and service technology by building on its existing industrial advantages and expanding its focus beyond 5G connectivity to encompass the entire strategic value chain, from device and component manufacturing to cloud-based service delivery; The telecommunications industry is just one of several industrial participants whose strategic roadmaps need to be aligned. Others include the cloud, the Internet of Things, and components and devices. Promote scientific and technological prowess in Europe so that the continent can take the lead in developing and perfecting 6G networks by 2030; Enhance the rollout of digital	We continue to monitor and engage with the evolving standards, publications, working-group outputs and other relevant deliverables issued by SNS JU and associated European and international standardisation fora. In particular, we stay up to date with recent conference and workshop outputs (for example the EuCNC & 6G Summit 2025 held in Poznań, Poland) which bring together research, industry and regulatory stakeholders. Within our Task's scope we ensure that our component designs and software artefacts align with the emerging best practices and normative requirements. Where relevant we flag adaptations to our architecture or implementation to reflect the	8BELLS

	infrastructures and adoption of digital solutions across European markets. This can be achieved through establishing a framework for strategic coordination within the CEF2 Digital program, fostering synergies within CEF2, and collaborating with DEP and InvestEU on the SNS JU. In the long run, the growth of vertical markets for 5G and 6G infrastructures and services in Europe will create opportunities for the supply sector of smart networks and services. Get ready for this. Meet the demands of European markets and public policies through digital innovation by 2030; this includes the most stringent demands of vertical industries and society as a whole in areas like energy efficiency, electromagnetic fields, and security. The goals of the European Green Deal, a human-centered and sustainable internet, ethics, privacy, and the security of networks and information are all areas in which the future of smart networks and services should be in line with the policies of the European Union.	latest methodologies and benchmark frameworks.	
One6G	6G technology overview (WG & WG2)	INNO participated in meetings and monitored the results of One6G in order to align the work of NANCY.	INNO
ECO6G	i2CAT initiative, ECO6G, stems from the belief that a collaborative effort is essential to shape the vision and research directions of 6G. It provides a platform for policymakers, program leaders, industry representatives, and key academic players to discuss the landmark actions and initiatives of this new connectivity paradigm. ECO6G is spearheaded by the i2CAT Foundation.	Among the identified initiatives, several interviews have been planned with leaders, industry representatives, and key academic institutions.	I2CAT

BDVA/DAIRO	BDVA is an association and does not produce standards or open-source initiatives.	Other than internal WG discussions, BDVA organises multiple annual actions for information exchange, dissemination, panel discussions etc., such as Data Week, the Big Data Value Forum and more, to enable direct sharing of results in the European Community. The GenAI task force will be producing a related whitepaper with INTRA inputs especially in terms of AI/genAI optimisation techniques (submission date TBD).	INTRA
NIST/PQC	NIST standardisation process of Post-quantum cryptography: NIST has asked for a 4th round selection of PQ algorithms on top the already selected algorithms during round 3	Two additional candidate algorithms, namely PROV and VOX, have been submitted by TDIS[1].	TDIS
ETSI PDL	ETSI GR PDL 019 V1.1.1 (2023-05)	Work for R3 in NANCY is aligned with the ETSI GR PDL 019 V1.1.1 (2023-05). NANCY will produce an SSI-enabled wallet and a basic DID infrastructure that is aligned with the specifications.	NEC
W3C	Verifiable Credentials Data Model v2.0	Work for ER3 in NANCY is aligned with the Verifiable Credentials Data Model v2.0 that was released in April 2024 (and consequently with previous versions). This document was published by the Verifiable Credentials WG as a Candidate Recommendation Draft using the Recommendation track. The WG is actively seeking implementation feedback for this specification, to which NEC may contribute.	NEC

[1] Post-Quantum Cryptography: Digital Signature Schemes | CSRC (nist.gov)

4. Progress and Achievements

Table 5 provides an overview of progress made in terms of standardisation activities and highlights the achievements or contributions made by the project partners to the end of the project.

Table 5: Progress and Achievements

Selected Organisation	Identified Standards / Open-Source Initiatives	Progress and Achievements	Lead Partner
3GPP	Standards related to the following Technical Specification Groups: • TSG RAN (Radio Access Network) • TSG SA (Service and System Aspects) • TSG CT (Core Network and Terminals)	Monitor and assess the development of the standards to determine how well NANCY's architecture and developments align with the 3GPP work.	TEI
IEEE	• IEEE 802.11 (WiFi) • P3201	CERTH has monitored the activities of relevant groups, including the update of the standard in April 2025 and the release of the latest official IEEE 802.11be standard, known as Wi-Fi 7, in July 2025. Both of them incorporate and update the provisions of the original IEEE 802.11k standard (originally published in 2007) that explicitly prescribed measurements at the UE and AP side of the network and their exchange to facilitate radio resource management. Moreover, the latest standard release (IEEE802.11-2024) incorporates the 802.11az amendment that caters for precise physical location measurement and lets the acquisition and sharing of location information, which also serves as input to the CERTH prediction tools. Thus, CERTH tools are aligned with WiFi and P3201 standards as they constitute AI-enhanced network functions that utilize WiFi related KPIs while promoting AI model interoperability within the NANCY B-RAN architecture. INNO monitored the technical briefs, standards, publications, and videos, of P3201 and the IEEE Blockchain TC and aligned the development within	CERTH, INNO

		NANCY (including B-RAN theoretical framework and blockchain tasks).	
NGMN	Mastering the route to Disaggregation	Monitor and analyse the evolution of the initiative.	TEI
IETF	RFC 9820: Authentication Service Based on the Extensible Authentication Protocol (EAP) for Use with the Constrained Application Protocol (CoAP))[1]	UMU is the author of this document.	UMU
ONF	SD-RAN	UOWM has deployed the SD-RAN to the Greek in-lab testbed in order to enhance its flexibility and provide additional O-RAN functionalities.	UOWM
ISO	ISO/IEC JTC 1/SC 17/WG 4: ISO/IEC 7816-8 new Ad Hoc workgroup on crypto Agility	TDIS leads this ad hoc group. Participate in workshops.	TDIS
	ISO/IEC JTC 1/SC 17/WG 4: 7816-6:2023/AWI Amd 1: Interindustry data elements for interchange – PQC	TDIS leads this ad hoc group. Participate in workshops.	TDIS
	ISO/IEC JTC 1/SC 17/WG 4: 7816-9:2017/AWI Amd 1: Commands for card management - PQC	TDIS leads this ad hoc group. Participate in workshops.	TDIS
Java Card	Javacard Forum - Technical Committee Key Agility	Participation in workshops.	TDIS
Global Platform	Global Platform - Creating new agile protocols in preparation for future post-quantum migration	Participation in workshops.	TDIS
WWRF	WWRF publishes several whitepapers focused on wireless communication technologies. Also, several working groups have been established, covering a wide range of topics (e.g., architecture, vehicle communications, radio technologies, cybersecurity, etc.).	UOWM became a member of WWRF and is monitoring the activities of WWRF and its WGs. Also, UOWM is in communication with the WWRF organizers and chairs in order to present the key project outcomes at a future WWRF meeting.	UOWM
O-RAN	O-RAN Use Cases Analysis Report 18.0 O-RAN.WG1.TS.Slicing-Architecture-R004-v14.01	OTE currently observes and evaluates the development of ORAN technology. Also, through Deutsche Telekom, OTE participates in the sustainability focus group.	OTE
OSM	Open Source NFV Management and Orchestration (MANO) software stack	MINDS has monitored OSM releases, workshops, and technical publications throughout the project	MINDS

[1] https://www.rfc-editor.org/rfc/rfc9820.html

		periods, staying active in community channels. Some of the best practices of OSM are integrated in the MINDS' components developed under NANCY's conceptual framework for AI-enabled network function orchestration, contributing to deliverables related to explainable AI frameworks (ER12).	
SNS JU	Telecommunications, IoT, cloud, and components and devices strategic roadmaps must align to construct 6G systems by 2030, European technology and science must be strengthened. The SNS JU's scope and governance include increasing digital infrastructure deployment and adoption in European markets through a strategic coordination mechanism for the CEF2 Digital program and fostering synergies between CEF2, DEP, and InvestEU. The initiative aims to help Europe's smart networks and services supplier industry capitalize on vertical 5G and 6G markets and facilitate innovation to meet European public policy goals and market, including the most demanding vertical industry requirements and societal needs like security, energy efficiency, and electromagnetic compatibility. Future smart networks and services must also meet EU policy goals including the European Green Deal, network and information security, ethics and privacy, and a sustainable, human-centric internet.	We have followed the standardisation ecosystem and ensured that our components remain compliant with published normative guidance. We have reviewed our component implementations against the identified standards and ensured alignment. We attended EuCNC & 6G Summit 2025 in Poland, enabling us to engage qualitatively with peer projects and gather knowledge on the latest trends in beyond-5G/6G networks.	8BELLS
One6G	6G technology overview (WG & WG2)	Participated in meetings and ensured high level alignment with NANCY components.	INNO
ECO6G	N/A	7 interviews done so far: - Liliana Arroyo Moliner, Director General of Digital Society Government of Catalonia	I2CAT

		- Mischa Dohler, VP of Emerging Technologies at Ericsson Inc. Technical Advisory Committee of the FCC and on the Spectrum Advisory Board of Ofcom ECO6G: Shaping the R&I Vision of 6G: - Daniel Camps Mur (male) leads the Mobile and Wireless Internet Group (MWI) at i2CAT. - Ana Freire leads the Vice-Deanship for Social Impact and Academic Innovation at the UPF Barcelona School of Management (Universitat Pompeu Fabra). - Johann Marquez-Barja, head of Programmable & Intelligent Networks at IDLab. - Christos Verikoukis, Professor at the University of Patras (Department of Computer Engineering & Informatics) and a Collaborative Faculty member with the Industrial Systems Institute (ISI) in Patras. - Dr Monique Calisti, the CEO of Martel Innovate and the President of Digital for Planet.	
BDVA/DAIRO	N/A (BDVA is an association, not a standardisation body)	Monitoring activities.	INTRA
NIST/PQC	NIST standardisation process of Post-quantum cryptography: NIST has asked for a 4th round selection of PQ algorithms on top of the already selected algorithms during round 3	Two additional candidate algorithms, namely VOX and PROV, have been submitted by TDIS. After round 4, the TDIS algorithms have not been selected[1]	TDIS
ETSI PDL	ETSI GR PDL 019 V1.1.1 (2023-05)	Monitoring activities. Work for ER3 in NANCY (SSI-enabled wallet) is aligned with the ETSI GR PDL 019 V1.1.1 (2023-05).	NEC
W3C	Verifiable Credentials Data Model v2.0	Monitoring activities. Work for ER3 in NANCY (SSI-enabled wallet) is aligned with the Verifiable Credentials Data Model v2.0.	NEC

4.1. SNS-JU and 6G-IA Working Groups Attendance

To stay aligned with SNS-JU standardisation activities, several NANCY partners have been involved in SNS-JU Working Groups (WGs). This engagement offers two key advantages: it enables SNS-JU to closely monitor the project's standardisation progress and impact—supported by dedicated tools described later in the Pre-Standardisation WG section—, and it keeps NANCY partners informed about

[1] https://csrc.nist.gov/pubs/ir/8545/final

new WG initiatives (such as white papers, workshops, and standards) to which the project could contribute.

At the beginning of the project, four WG were identified. During the project timeframe, two more WGs and one TF have been established, increasing the total number of groups to six.

- **Pre-STD WG**: The main objectives of this WG are the identification of standardisation and regulatory bodies, the definition of a roadmap of relevant topics for 6G, and raising awareness about standardisation. In this WG, there's an important effort to track any activity of the participants linked to standardisation. To this aim, on a quarterly basis, a spreadsheet file is circulated by the WG chair, which allows inserting and categorizing in a structured way any possible standardisation effort of the project. Once populated, the spreadsheet is then submitted by a project's representative to the WG chair, who collects the data and presents a comprehensive analysis of the collected data in one of the WG's monthly calls. VOS and UOWM are attending the monthly calls and coordinating the submission of the tracking data.
- **Security WG**: This WG focuses on security, fostering new ideas and concepts connected to it, for instance, the integration of AI and other cutting-edge technologies and paradigms. NEC is a member of the WG, actively participating in its White Papers, and has presented NANCY, specifically around the security challenges of the project.
- **6G Architecture WG**: The main objective of this WG is the identification of architectural concepts and components with the aim of agreeing on a common European approach in fact of 6G architecture. UOWM is participating in this WG and has presented the project during one of the weekly calls. Moreover, UOWM has contributed to this WG whitepaper, titled "Towards 6G Architecture: Key Concepts, Challenges, and Building Blocks".
- **Reliable Software Network WG**: This WG wants to assess state-of-the-art networking paradigms and techniques to reach a high degree of networking reliability. UOWM is participating in this WG and has presented the project during one of the weekly calls.
- **Sustainability TF**: This TF worked on identifying the sustainability landscape of the already funded SNS JU projects. INNO participates in this TF and was among the contributors to the Sustainability White Paper of the SNS JU.
- **Sustainability WG**: This WG continues the work of the Sustainability TF and aims to create a fundamental "Body of Knowledge" within SNS on the sustainability scope, terminology, processes, and methodologies. INNO participates in this WG and has presented the sustainability considerations of NANCY.
- **Hardware Technologies WG:** The WG is focusing on research and development in the areas of systems, components, materials, and chipsets, which are fundamental for the development of 6G networks. UOWM is participating in the activities of this WG and has contributed to the needs analysis questionnaire.

In addition to participating in the WGs and TFs of the SNS JU, INNO assumed an active role in the generation of the related Vertical White Papers. Specifically, Dr. Stylianos Trevlakis (INNO) was a section editor in both the "Media and Entertainment White Paper" and the "Public Protection and Disaster Relief White Paper". Moreover, UOWM has provided contributions to the "Media and Entertainment White Paper", focusing on the scalability, resource management, and security aspects. Finally, the NANCY project and its vision were also presented in a workshop jointly promoted by 6G-IA and 5G-MAG titled "Media Beyond 5G – Insights from European Projects".

4.2. CEN/CENELC Liaison Organization assessment

As part of its standardization strategy, the NANCY consortium has evaluated the activities of the European Committee for Standardization (CEN) and the European Committee for Electrotechnical Standardization (CENELEC), two non-profit organizations responsible for developing high-quality European standards for products, services, and processes.

- In this context, the consortium has analysed the technical committees that have been established under the CEN and CENELEC umbrella and identified the following as particularly relevant to the project's technical scope: CEN/CLC/JTC 13 – Cybersecurity and Data Protection
- CEN/CLC/JTC 19 – Blockchain and Distributed Ledger Technologies
- CEN/CLC/JTC 21 – Artificial Intelligence
- CEN/CLC/JTC 22 – Quantum Technologies

Among the various participation mechanisms offered by CEN and CENELEC, the consortium considers the Liaison Organization status to be the most suitable and accessible option for NANCY. This mechanism provides an efficient channel for contributing to ongoing standardization work and offers the following rights and opportunities:

- Submission of technical contributions (documents, comments, proposals) to the relevant committees, either at meetings or by correspondence;
- Introduction of preparatory work that can support or feed into current standardization activities;
- Proposal of new technical documents that may, through the regular consensus-based process, be adopted as CEN or CENELEC deliverables;
- Provision of expert advice on current and future work programmes;
- Participation without voting rights.

Note that liaison organizations do not have voting rights in the committees.

The consortium is currently exploring the establishment of a formal liaison with CEN. To this end, active discussions are ongoing with the CEN/CENELEC coordination team in order to clarify all practical, procedural, and budgetary implications of such a liaison.

5. Future Roadmap

Table 6 outlines the future roadmap for technology development and integration in alignment with standardisation activities and defines upcoming milestones and tarsgets for contributing to standards development.

Table 6: Future Roadmap

Selected Organisation	Identified Standards / Open-Source Initiatives	Next steps	Lead Partner
3GPP	Standards related to the following Technical Specification Groups: • TSG RAN (Radio Access Network) • TSG SA (Service and System Aspects) • TSG CT (Core Network and Terminals)	Continue to monitor the identified area of interest related to the NANCY project.	TEI
IEEE	• IEEE 802.11 (WiFi) • P3201	Continue the monitoring of pages, lists, and overall activities of the IEEE 802.11 groups related to AI-native wireless standardization. INNO will participate in the P3201 meetings and contribute to the document drafting.	CERTH, INNO
NGMN	Mastering the route to Disaggregation	Continue to monitor the identified focus area.	TEI
IETF	RFC 9820: Authentication Service Based on the Extensible Authentication Protocol (EAP) for Use with the Constrained Application Protocol (CoAP)[1]	Continue the participation in ACE Working group	UMU
ONF	SD-RAN	UOWM will continue to monitor the activities and releases of SD-RAN and the Aether project and deploy an improved version of the testbed, utilizing all Aether components. This will facilitate the evolution into a more robust and cloud-native deployment, while also enabling seamless interoperability among the Aether components.	UOWM
ISO	ISO/IEC JTC 1/SC 17/WG 4 : ISO/IEC 7816-8 new Ad Hoc workgroup on crypto Agility	Target publication: 2026	TDIS
	ISO/IEC JTC 1/SC 17/WG 4 :	Target publication: 2026	TDIS

[1] https://www.rfc-editor.org/rfc/rfc9820.html

	7816-6:2023/AWI Amd 1: Interindustry data elements for interchange – PQC		
	ISO/IEC JTC 1/SC 17/WG 4 : 7816-9:2017/AWI Amd 1: Commands for card management - PQC	Target publication: 2026	TDIS
Java Card	Javacard Forum - Technical Committee Key Agility	Standard roadmap depends on JavaCard priorities	TDIS
Global Platform	Global Platform - Creating new agile protocols in preparation for future post-quantum migration	Standard roadmap depends on Global Platform priorities	TDIS
WWRF	• Communication Architectures and Technologies Working Group • Radio Communication Technologies Working Group • Cybersecurity Working Group	UOWM is monitoring the organization of future meetings and calls for presentations in order to present the project and its outcomes.	UOWM
O-RAN	ORAN will continue the development of technical specifications for O-RAN components, improving interoperability, and ensuring that O-RAN technologies align with 5G standards. and O-RAN is focused on integrating AI/ML for automated radio access architecture and network optimization. O-RAN Release 003 includes enhancements to RAN Slicing and SMO features and introduces new features related to security and RIC.	OTE monitors the activities of ORAN	OTE
OSM	Open Source NFV Management and Orchestration (MANO) software stack.	MINDS has actively disseminated NANCI's advancements and OSM-related insights through participation in multiple international conferences and workshops. The organization presented at EU-CNC (European Conference on Networks and Communications), DEFEA (Defence and Security Exhibition), and FNWF2024 (Future Networks World Forum), where research outcomes related to AI-enabled network orchestration were shared with the academic and industrial community. Through these dissemination	MINDS

		activities, MINDS has contributed to raising awareness about open-source MANO solutions and their integration with AI/ML technologies in next-generation wireless networks	
SNS JU	By improving industrial strengths and shifting the focus from 5G connectivity to a whole strategic value chain that encompasses cloud-based service provisioning, components, and devices, Europe can strengthen its technological leadership in future smart networks and services. This requires coordinating strategic roadmaps from telecommunications, Internet of Things, cloud, and component companies. It seeks to lead 6G system development in Europe by 2030 through technological and scientific excellence. Preparing the European smart networks and services supplier business for long-term potential from vertical markets for 5G and 6G infrastructures and services is another priority. The program seeks to enable digital innovation that satisfies European market and public policy goals, including vertical industry and societal needs in security, energy efficiency, and electromagnetic fields, by 2030. It also promotes aligning future smart networks and services with EU policy goals like the European Green Deal, information and network privacy, security, and a human-centric sustainable internet.	Going forward, we will continue to track key standardisation deliverables, calls for proposals, working-group drafts and project-level publications relevant to our domain. We also plan to attend summits and conferences related to B5G/6G technologies to maintain alignment with the latest standardisation activities, foster collaboration, and identify opportunities for dissemination and contribution.	8BELLS
One6G	6G technology overview (WG & WG2)	INNO will participate in the One6G meetings and contribute to the document drafting.	INNO
ECO6G	N/A	Monitoring activities, and check if any other interview	I2CAT

BDVF/DAIRO	Does not apply to standardisation	Monitoring activities	INTRA
NIST/PQC	NIST standardisation process of Post-quantum cryptography: NIST has selected after a 4th round selection process the HQC algorithms on top of the already selected algorithms during round 3.	Awaiting official FIPS specifications	TDIS
ETSI PDL	ETSI GR PDL 019 V1.1.1 (2023-05)	Monitoring activities. Work for R3 in NANCY (SSI-enabled wallet) will remain aligned with the ETSI GR PDL 019 V1.1.1 (2023-05). This shall include the NANCY implementation of a DID infrastructure.	NEC
W3C	Verifiable Credentials Data Model v2.0	Monitoring activities. Work for R3 in NANCY (SSI-enabled wallet) will remain aligned with the Verifiable Credentials Data Model v2.0.	NEC

5.1. SNS-JU and 6G-IA Working Groups: Future Actions

During the project, NANCY partners have closely monitored the activities carried out within the SNS-JU and 6G-IA working groups and supported the dissemination of their outcomes through white papers and international workshops. This work has been performed mainly during the second half of the project, once the consortium identified which standardisation initiatives could most benefit from its expertise. In addition, the consortium intends to make full use of the tools provided by SNS-JU to improve coordination of standardisation efforts across SNS projects. One such tool is the online platform available at https://sns-trackers.sns-ju.eu, designed to consolidate data collected by the Pre-STD WG and present project-level contributions in a clear and concise manner. Importantly, the platform will also integrate input from standardisation experts, who will highlight potential actions that projects can take to maximise their impact on standardisation activities.

6. Conclusion

This Final Standardisation Activities Report documents the progress and outputs of Task 1.6 over the lifetime of the NANCY project. The project has demonstrated a clear and sustained commitment to standardisation and clustering activities relevant to integrating blockchain, AI, and MEC into B5G systems. Key achievements include the identification of relevant SDOs and industry fora, active monitoring of ongoing standardisation work, and ten active contributions that reflect the consortium's engagement with the standardisation ecosystem. The project has also maintained constructive linkages with European initiatives: several partners have participated in SNS JU and 6G IA working groups, and the project's vision was presented in the joint 6G IA / 5G MAG workshop "Media Beyond 5G — Insights from European Projects." These interactions have helped keep NANCY aligned with European research and policy directions and have provided channels for cross-project coordination and knowledge exchange.

Indicators presented in this report show solid initial progress: a defined standardisation roadmap, a set of concrete initiatives and contributions, and a programme of monitoring and alignment with external bodies. The consortium's proactive attendance at SNS JU and 6G IA activities demonstrates an effective approach to staying informed and contributing to the wider B5G standardisation dialogue.

At the same time, the report identifies opportunities to broaden and deepen our standardisation impact. Not all relevant standardisation areas have been covered to the same extent, and targeted efforts are required to close gaps and convert monitoring and alignment activities into standardized outputs where appropriate. Strengthening engagement with additional SDOs, increasing the number of formal submissions where justified, and ensuring sustained participation in key working groups will be important next steps.

Looking forward, the agreed roadmap frames a clear set of milestones and targets for the remainder of the project and beyond. Priority actions include consolidating the ten active contributions into durable inputs to standards and fora, expanding cross-project collaboration within European programmes, and intensifying dissemination and liaison activities to maximise the uptake of NANCY results.

In summary, NANCY has established a solid foundation for standardisation activities: the consortium is engaged, aligned with significant European working groups, and has produced initial contributions and a roadmap. To translate these foundations into lasting standardisation impact, the project must pursue targeted follow-up actions, increase coverage across all relevant standards domains, and sustain active collaboration with SDOs and industry fora. Continued coordination among partners, prioritized contribution activity, and systematic follow-up on the roadmap will position NANCY's outcomes for the greatest possible influence on B5G standardisation.