

NEMO

Next Generation Meta Operating System

D6.6 Dissemination & Standardization & Communities Liaison – Intermediate version

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List of Acronyms

Abbreviation / acronym	Description
EC	European Commission
Dx.y	Deliverable number y belonging to WP x
WP	Work Package
IoT	Internet of Things
OEMs	Original Equipment Manufacturer
TG	Target Group
DIH	Digital Innovation Hub
SDO	Standards Developing Organizations
SME	System Management Entity

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Executive Summary

This document presents the intermediate status on the dissemination, standardisation, and communities liaison plan for the project. It contains the list of the current actions and time scales.

This document has 3 releases:

- This first release (D6.5), month 6, describing the initial dissemination plan, the list of ongoing and upcoming actions and timelines. We completed the release with a chapter on Standardization activities and Communities liaison.
- A second release (D6.6), at month 18 presenting the new actions, an update of the dissemination, communication plan and business plans as well as community liaison plans.
- A final release (D6.7), at month 36, describing the final results dissemination, standardisation and community liaison plans of the different consortium members. The outcomes resulting from the standardisation, and clustering tasks will also be reported in this final version.

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1 Introduction

1.1 Purpose of the document

The objective of the work package "WP6 Impact Creation & Outreach" is to increase the visibility of the NEMO project in order to attract the first users and to encourage the current consortium to continue and maintain the activities in the project. In other words, the objective of WP6 is to sustain the project by initiating a community of consumers and developers of NEMO technologies.

In particular, the work package formed an Advisory Board for collecting feedback and advise on system approach. The work package is consolidating project results and preparing the ground for their large-scale exploitation, also by triggering the scientific and technical communities to bring forward the state of the art on project technologies. Furthermore, the work package aim is to set-up communication channels to disseminate Open Calls and project outcomes as well as contribute to relevant Open source communities & foundations, standards organizations, and associations.

The document updates the initial dissemination plan, the list of ongoing and upcoming actions and timelines. Furthermore, Standardization activities and Community liaison are taken into consideration with dedicated chapters.

1.2 Relation to other project work

This document is related to the Task 6.4 ‘Liaison with Cluster, Open Source communities & standardization’. The aim of this task is to ensure knowledge transfer and awareness of NEMO solution in selected Open source communities and foundation.

Moreover, in this document, the set-up of the communication and dissemination activities, is presented, including updates on the social media accounts.

1.3 Structure of the document

This document consists of the following sections:

- **Section 2** presents the current Dissemination and Communication plan identified by the consortium and the key messages the partners have in mind to interact and attract specific audiences.
- **Section 3** presents the Standardization strategy as well as the current associated plan.
- **Section 4** describes the initial Community Liaison plan and the initial strategy defined by the consortium to sustain the project results as well as the objectives, their selection criteria, and the action the consortium is putting in place to achieve these objectives.
- **Section 5** concludes the document.

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2 Dissemination & Communication Plan

The Dissemination and Communication plan describes how the project will create and follow effective **dissemination and communication activities** to promote NEMO, the adoption of its outcomes also beyond project’s lifetime and to engage its stakeholders.

The NEMO dissemination and communication plan covers the following aspects:

- Objectives and goals of the envisioned activities (*the what*).
- Preliminary identification of stakeholders and target groups to be engaged (*the whom*).
- The methodology to be implemented to effectively engage these actors (*the why*).
- A plan of the specific activities that will evolve in line with the development of the overall project work and activities, in close collaboration with the rest of NEMO Work Packages (*the how*).

The overall dissemination and communication strategy aims to create synergies, contribute to partnerships development and knowledge sharing among stakeholders, while optimizing the resources and reducing the time between the news production and its delivery to the NEMO wide audience, towards the following objectives:

- To identify and engage the most relevant target stakeholders.
- To establish, maintain and grow the NEMO community.
- To create visibility and promote the NEMO work and results for selected target groups by creating promotional material and information campaigns.
- To disseminate project activities and outcomes to the broad audience, with specific focus on potential adopters of NEMO outcomes.
- To increase the Open Calls visibility to engage possible applicants.

2.1 Dissemination & Communication Strategy and Phases

NEMO success will be measured based on its market penetration and adoption by open sources communities, public authorities and private companies, along with its impact on the “economic multipliers”, that are SMEs. As such the main goal of the NEMO dissemination and communication activities is to raise awareness on the NEMO technological and scientific achievements. An efficient impact of NEMO must be supported by the development and implementation of a Dissemination strategy. The key steps are depicted in Figure 1.

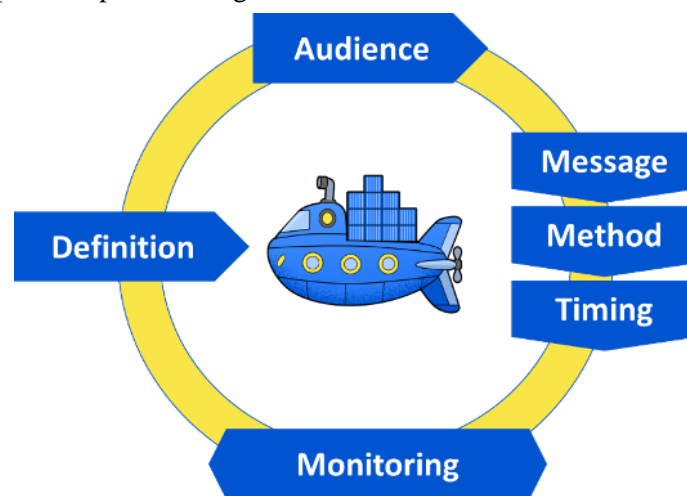


Figure 1: NEMO Dissemination & Communication strategy

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The strategy will focus on:

- **Definition** of the dissemination/communication strategy and **target audience**.
- Fine tuning of the **message, methodology, activities and material** (e.g., press releases, research papers, white papers, videos, workshops, meetings, policy briefs, open days, Open Calls, promotional material) and the correct **timing**.
- **Monitor and evaluate** the public outreach activities, including redefinition and corrective actions.

All the activities of dissemination and communication strategy will be carried out using **three main phases** following the different phases of the project. Each of these phases has specific objectives and target groups and will therefore perform specific actions using specific channels during the phase. As shown in Figure 2, NEMO dissemination and communication activities are categorized based on the position of the target audience with respect to the time-to-market of the results:



Figure 2: - NEMO Dissemination and communication strategy. Intensity increases each year.

- **Phase I** (Months 1-18): Selecting and establishing the dissemination channels, key messages, communication activities towards innovation, IoT/Edge ecosystems/communities (Long time-to-market).
- **Phase II** (Months 19-30): Policy fostering business innovation (Midterm time-to-market).
- **Phase III** (Months 31-36): Matching market analysis and Exploitation (Short time-to-market).

2.2 NEMO Dissemination and Communication Handbook Marketing assets

As part of the dissemination and communication strategy, NEMO provides a “*Dissemination and Communication Handbook*”. These guidelines are intended to encourage, guide and support the NEMO partners in their dissemination and communication activities during the project’s lifetime.

The guidelines are composed of the following sections:

- Internal Communication, where it is explained how to interact within WP6.
- Social media, where it is explained how to deal with Twitter and LinkedIn.
- Participation in events, where the procedures to be followed before/during and after an event are underlined.
- Project Website, where it is indicated how to contribute to populate the project website.
- PR Material, where it is indicated how to find the PR material, logos and templates.
- Technical Dissemination, where all partners can have access and contribute to the Technical Dissemination plan.

The Dissemination and Communication Handbook is intended as a living document, meaning that it could be updated during the course of the project, taking into consideration the evolution of the dissemination and communication plan.

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2.3 Stakeholder analysis

One of the NEMO project core objectives is the widespread awareness, adoption and impact creation of the outcomes achieved throughout the project. In order to become successful in such task, a specific plan is required to interact with key stakeholders, establishing, maintaining and growing a committed community around NEMO. The first stage of the strategy requires to understand which stakeholders NEMO will engage with and for what purpose. Specific profiles that need to be identified so as to be involved or targeted. The objective is to facilitate a standard taxonomy of roles to be taken into consideration while assessing use case scenarios and new business models. Within the analysis of stakeholders, we identify 12 Target Groups:

- TG1: IoT/Edge equipment manufacturers and OEMs.
- TG2: Telecoms and Edge/Cloud providers/operators.
- TG3: SMEs/Midcaps IoT/Edge Apps developers
- TG4: IoT/Edge/Native cloud open source ecosystems
- TG5: Network and Open Network Management ecosystems
- TG6: Academy/Researchers
- TG7: SDOs/Alliances/Initiatives
- TG8: DIHs
- TG9: Policy makers
- TG10: Industry, Utilities, Farmers
- TG11: Sustainable Cities/ECO Initiatives
- TG12: Citizens/Lifelong learners community

With the definition of these target groups, the key characteristics of the dissemination plan are:

Target Group (TG)	Dissemination & Communication Goals
IoT/Cloud Technology Communities: TG1, TG2, TG3	<ul style="list-style-type: none"> • Achieve consensus on NEMO requirements, features, functionalities, promote security/privacy/ECO issues. • Create awareness of NEMO roadmap, planned (non-)functional features. • Establish NEMO as “default” solution for IoT-Edge-Cloud continuum.
Open Source Code/Data communities: TG4, TG5	
Scientific Communities: TG6, TG7, TG8	<ul style="list-style-type: none"> • Increase awareness and get feedback on research gaps, emerging new technologies, human centric science.
Vertical End-Users Communities: TG9, TG10	<ul style="list-style-type: none"> • Accelerate the rollout and adoption of NEMO, targeting end-to-end verticals. • Establish NEMO as “default” smart city solution. • Increase awareness on the performance vs RES/CO2 reduction trade-offs.
Wider Audience: TG11, TG12	

Table 1: Stakeholders target groups activities objectives

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2.4 Social Media Dissemination

All the different aspects of the project's visual identity including the logo, official templates, project website, and online channels, have been presented in the previous version of this deliverable D6.5.

In this version, an update of the current status of social media is reported.

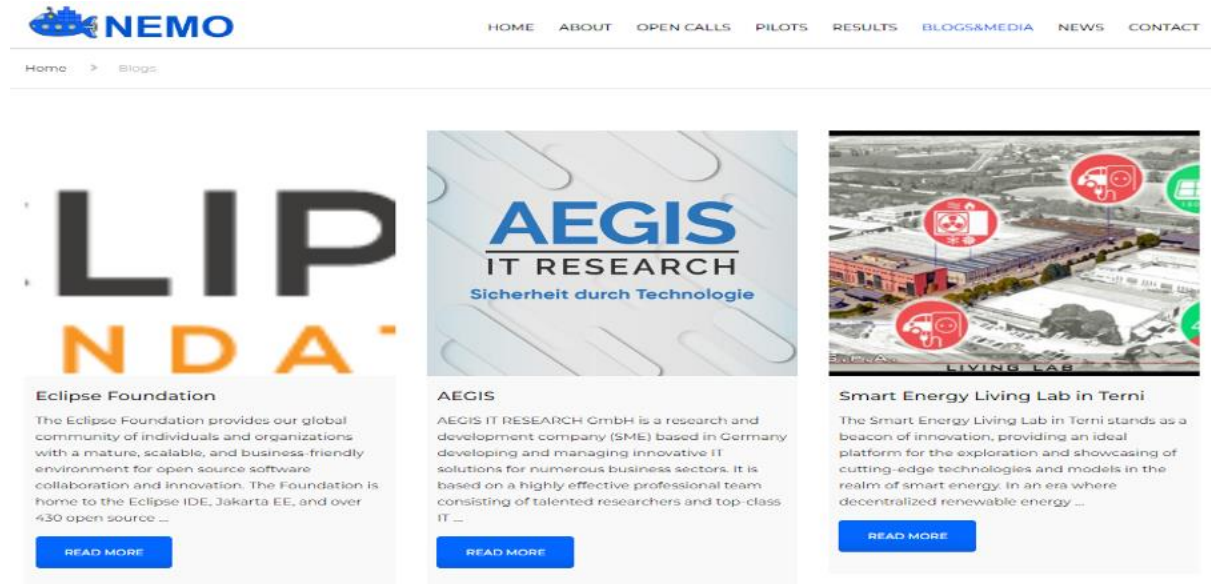


Figure 3: - Project website – Blog.

In the current time frame, there are 31 **blog entries** in the blog section:

Num	Post Title	Link
1	Getting started with Nemo, introducing Cumucore	https://meta-os.eu/index.php/2022/10/25/getting-started-with-nemo-introducing-cumucore/
2	Emotion in Nemo	https://meta-os.eu/index.php/2022/12/05/emotion-in-nemo/
3	INNOVATION AT UNIVERSIDAD POLITÉCNICA DE MADRID: THE ROLE OF GATV IN ARTIFICIAL INTELLIGENCE AND IMMERSIVE MEDIA	https://meta-os.eu/index.php/2023/03/15/innovation-at-universidad-politecnica-de-madrid-the-role-of-gatv-in-artificial-intelligence-and-immersive-media/
4	WINDTRE IN NEMO	https://meta-os.eu/index.php/2023/05/08/windtre-in-nemo/

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Num	Post Title	Link
5	ABOUT MAGGIOLI	https://meta-os.eu/index.php/2023/05/17/2997/
6	SPACE HELLAS	https://meta-os.eu/index.php/2023/06/23/space-hellas/
7	CONTINENTAL	https://meta-os.eu/index.php/2023/06/30/continental/
8	TELEFÓNICA	https://meta-os.eu/index.php/2023/07/13/telefonica/
9	SPHYNX TECHNOLOGY SOLUTIONS (STS)	https://meta-os.eu/index.php/2023/07/13/sphynx-technology-solutions-sts/
10	NETCOMPANY-INTRASOFT	https://meta-os.eu/index.php/2023/07/31/netcompany-intrasoft/
11	SYNELIXIS	https://meta-os.eu/index.php/2023/08/02/synelixis/
12	ICCS	https://meta-os.eu/index.php/2023/08/11/iccs/
13	NOVOMATIX	https://meta-os.eu/index.php/2023/08/21/novomatix/
14	SIMAVI	https://meta-os.eu/index.php/2023/09/01/simavi/
15	OTE	https://meta-os.eu/index.php/2023/09/07/ote/
16	ENG	https://meta-os.eu/index.php/2023/09/22/eng/
17	RWTH	https://meta-os.eu/index.php/2023/09/27/rwth/
18	ATOS	https://meta-os.eu/index.php/2023/10/03/atos/

Num	Post Title	Link
19	UNVEILING THE POWER OF META-ORCHESTRATION IN THE NEMO PROJECT	https://meta-os.eu/index.php/2023/10/10/unveiling-the-power-of-meta-orchestration-in-the-nemo-project/
20	ALTO: THE PROTOCOL DESIGNED FOR UNINTERRUPTED NETFLIX VIEWING	https://meta-os.eu/index.php/2023/10/16/alto-the-protocol-designed-for-uninterrupted-netflix-viewing/
21	ASM	https://meta-os.eu/index.php/2023/10/18/asm/
22	ABOUT SORBONNE UNIVERSITY	https://meta-os.eu/index.php/2023/10/26/about-sorbonne-university/
23	FOUNDATION OF THE HELLENIC WORLD (FHW)	https://meta-os.eu/index.php/2023/11/03/foundation-of-the-hellenic-world-fhw/
24	EMPOWERING SMARTER CITIES WITH AIOT: REVOLUTIONIZING URBAN LIVING (1)	https://meta-os.eu/index.php/2023/11/06/empowering-smarter-cities-with-aiot-revolutionizing-urban-living/
25	ENTERSOFT S.A	https://meta-os.eu/index.php/2023/11/14/entersoft-s-a/
26	EMPOWERING SMARTER CITIES WITH AIOT: REVOLUTIONIZING URBAN LIVING (2)	https://meta-os.eu/index.php/2023/11/14/empowering-smarter-cities-with-aiot-revolutionizing-urban-living-2/
27	TSG	https://meta-os.eu/index.php/2023/11/24/tsg/
28	SMART ENERGY LIVING LAB IN TERNI	https://meta-os.eu/index.php/2023/12/14/smart-energy-living-lab-in-terni/
29	AEGIS	https://meta-os.eu/index.php/2023/12/21/aegis/

Num	Post Title	Link
30	ECLIPSE FOUNDATION	https://meta-os.eu/index.php/2024/01/08/eclipse-foundation/
31	ILLUSTRATING THE TRANSFORMATIVE POWER OF AI, IOT, EDGE, AND CLOUD CONVERGENCE: SMARTER CITIES USE CASES	https://meta-os.eu/index.php/2024/02/21/illustrating-the-transformative-power-of-ai-iot-edge-and-cloud-convergence-smarter-cities-use-cases/

Table 2: Blog post in the blog section

Now, the **news section** has 28 posts.

Num	Post Title	Link
1	FUTURE EUROPEAN PLATFORMS FOR THE EDGE: META-OPERATING SYSTEMS	https://meta-os.eu/index.php/2022/09/01/mos-nx-iot-edge-computing/
2	OUR PUBLIC REPOSITORY AT ZENODO IS LIVE!	https://meta-os.eu/index.php/2022/10/27/our-public-repository-at-zenodo-is-live/
3	NEMO YOUTUBE CHANNEL OFFICIALLY OPENED!	https://meta-os.eu/index.php/2023/01/27/nemo-youtube-channel-officially-opened/
4	NEMO AT EU_CLOUD_EDGE_IOT WORKSHOP IN TOULOUSE	https://meta-os.eu/index.php/2023/01/27/nemo-at-eucloudedgeiot-workshop-in-toulouse/
5	NEMO CELEBRATES THE INTERNATIONAL DATA PROTECTION DAY	https://meta-os.eu/index.php/2023/01/30/nemo-celebrates-the-international-data-protection-day/
6	SPECIAL ISSUE : RECENT ADVANCES AND CHALLENGES IN IOT, CLOUD AND EDGE COEXISTENCE	https://meta-os.eu/index.php/2023/02/10/special-issue-recent-advances-and-challenges-in-iot-cloud-and-edge-coexistence/
7	NEMO AT EMBEDDED WORLD	https://meta-os.eu/index.php/2023/04/21/nemo-at-embedded-world/

Num	Post Title	Link
8	MADRID PLENARY MEETING	https://meta-os.eu/index.php/2023/05/03/madrid-pleenary-meeting/
9	NEMO PARTICIPATED IN THE “CONCERTATION AND CONSULTATION ON COMPUTING CONTINUUM” THAT TOOK PLACE IN BRUSSELS IN MAY	https://meta-os.eu/index.php/2023/05/17/nemo-participated-in-the-concertation-and-consultation-on-computing-continuum-that-took-place-in-brussels-in-may/
10	NEMO PROJECT EXPLAINS USE CASE SMART FARMING ON AN ONLINE WORKSHOP ORGANISED BY EU_CLOUDEDGEIOT	https://meta-os.eu/index.php/2023/05/23/nemo-project-explains-use-case-smart-farming-on-an-online-workshop-organised-by-eu_cloudedgeiot/
11	NEMO PARTICIPATES ON THE AIOT WEBINAR IN JUNE	https://meta-os.eu/index.php/2023/06/23/nemo-participates-on-the-aiot-webinar-in-june/
12	NEMO MEETING KONG	https://meta-os.eu/index.php/2023/07/19/nemo-meeting-kong/
13	THE FIRST OPEN CALL OF NEMO HAS BEEN PUBLISHED TODAY!	https://meta-os.eu/index.php/2023/08/01/the-first-open-call-of-nemo-has-been-published-today/
14	THE SUBMISSIONS PORTAL FOR THE FIRST NEMO OPEN CALL IS OPEN	https://meta-os.eu/index.php/2023/09/01/the-submissions-portal-for-the-first-nemo-open-call-is-open/
15	NEMO PROJECT PUBLISHES “FEDERATED RESILIENCE ENHANCED WITH DIFFERENTIAL PRIVACY (FREDY)” IN THE JOURNAL FUTURE INTERNET	https://meta-os.eu/index.php/2023/09/05/nemo-project-publishes-federated-resilience-enhanced-with-differential-privacy-fredy-in-the-journal-future-internet/
16	NEMO PROJECT TO PRESENT NEMO – OPEN CALL #1 IN EU_CLOUDEDGEIOT.EU ORGANIZED WEBINAR	https://meta-os.eu/index.php/2023/09/12/3152/
17	NEMO PROJECT PRESENTATION, WHAT IS IT?	https://meta-os.eu/index.php/2023/09/27/nemo-project-presentation-what-is-it/

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Num	Post Title	Link
18	NEMO PROJECT OPEN CALLS EXPLAINED	https://meta-os.eu/index.php/2023/09/27/nemo-project-open-calls-explained/
19	NEMO PARTNERS REUNITE IN ATHENS FOR THEIR 4TH PLENARY MEETING	https://meta-os.eu/index.php/2023/09/29/nemo-partners-reunite-in-athens-for-their-4th-plenary-meeting/
20	NEMO PROJECT WAS PRESENT IN ESAAM 2023	https://meta-os.eu/index.php/2023/10/23/nemo-project-was-present-in-esaam-2023/
21	OPEN CALL #1 WEBINAR	https://meta-os.eu/index.php/2023/10/25/open-call-1-webinar/
22	INTRODUCING THE NEMO PROJECT ON GITLAB	https://meta-os.eu/index.php/2023/10/30/introducing-the-nemo-project-on-gitlab/
23	NEMO PROJECT WILL BE PRESENT IN THE EVENT “GIVING ENERGY AN EDGE”	https://meta-os.eu/index.php/2023/11/09/nemo-project-will-be-present-in-the-event-giving-energy-an-edge/
24	THE DATA GOVERNANCE ACT ENTERED INTO APPLICATION SEPTEMBER 2023	https://meta-os.eu/index.php/2023/11/28/the-data-governance-act-entered-into-application-september-2023/
25	NAVIGATING THE FUTURE: UNDERSTANDING THE NEW EUROPEAN LAW ON ARTIFICIAL INTELLIGENCE	https://meta-os.eu/index.php/2023/12/13/navigating-the-future-understanding-the-new-european-law-on-artificial-intelligence/
26	NEMO PROJECT AT THE WEBINAR “STANDARDS (AI, IOT AND DIGITAL TWIN) IN THE MAKING”	https://meta-os.eu/index.php/2023/12/15/nemo-project-at-the-webinar-standards-ai-iot-and-digital-twin-in-the-making/
27	NEMO CO-ORGANIZES MECC 2024 WORKSHOP AT ACM EUROSYS 2024	https://meta-os.eu/index.php/2024/01/25/nemo-co-organizes-mecc-2024-workshop-at-acm-eurosys-2024/
28	NEMO IN AGROTICA 2024	https://meta-os.eu/index.php/2024/02/08/nemo-was-

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Num	Post Title	Link
		presented-at-the-30th-anniversary-international-exhibition-agrotica-2024/

Table 3: New Posts Overview

All the features from the website could be found at NEMO’s Deliverable D6.1 – Project Web site & Social Channels.

In terms of performance, the breakdown from the site’s metrics is presented below. This overview spans the project’s run so far and shows the aggregated totals from the official launch of NEMO’s website (end of September 2022) to the end of January 2024. During the first year and 4-months period under consideration, the website has driven a traffic of 4.200 users, giving an average of 350 monthly users, achieved a total of 16.083 page views, opening a total of 4.822 sessions. The users’ geographic distribution is presented in Figure 4

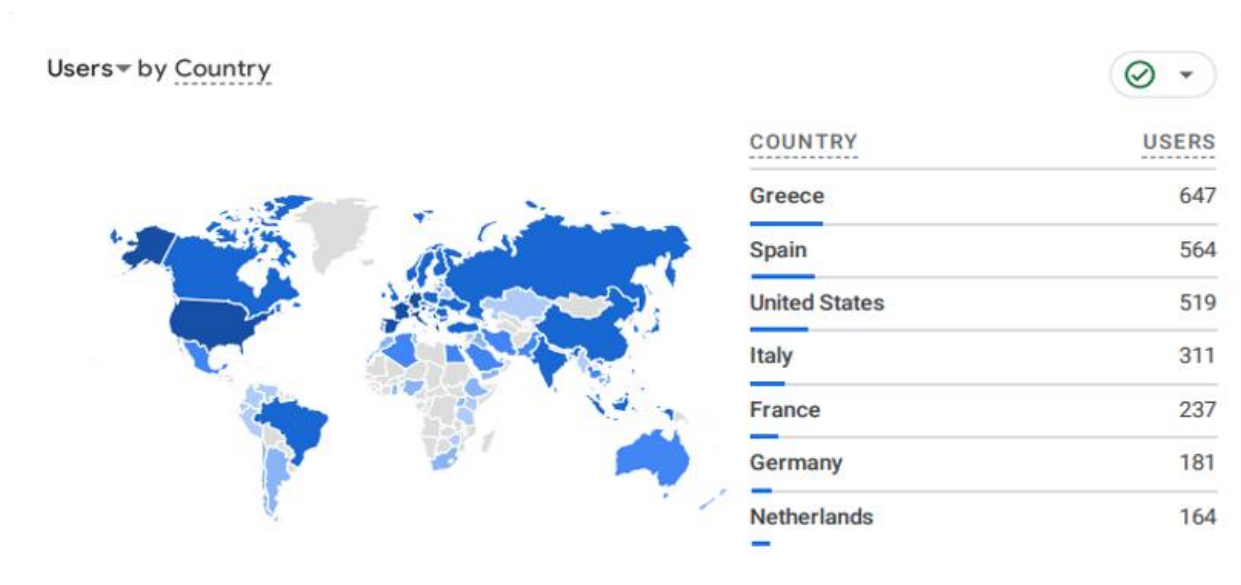


Figure 4: - Website users’ geographic distribution

2.5 Online Channels

The NEMO project is present on several social media channels, including X, LinkedIn, and YouTube, in order to reach a wider audience and increase visibility for the project.

X (https://twitter.com/HE_NEMO_Project): NEMO project uses X to share daily news, updates, and other relevant information about the project, as well as to engage with the community by re-tweeting and responding to tweets from other users. NEMO’s X account has 160 followers and 166 posts. YouTube account has 3 videos on the project and 18 followers. LinkedIn has 85 posts and 276 followers.

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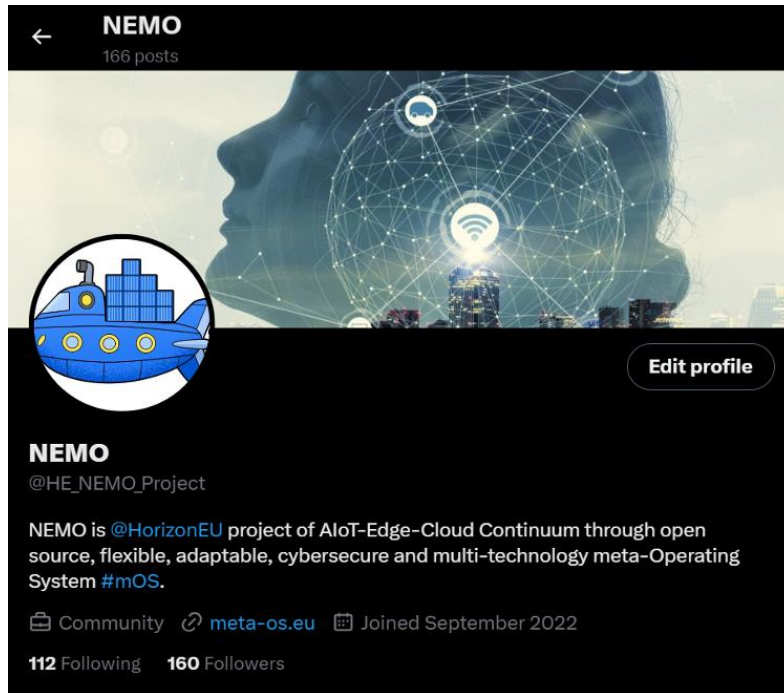


Figure 5: - X- profile

LinkedIn (<https://www.linkedin.com/in/HE-NEMO/>): NEMO project uses LinkedIn to connect with other professionals in the field, share information about the project, and to build relationships with potential collaborators. NEMO’s LinkedIn account has 197 connections.

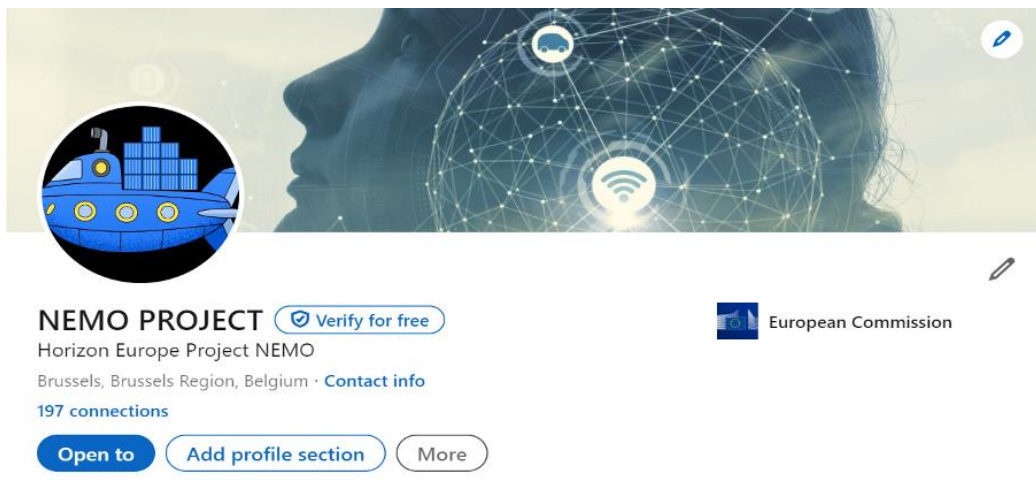


Figure 6: - LinkedIn profile

YouTube (<https://www.youtube.com/@henemoproject>): NEMO project uses YouTube to share videos about the project, such as project presentations, demos, and webinars. YouTube also allows the project to easily share the videos in other social media platforms. NEMO’s YouTube account has 18 subscribers, 3 videos and 267 visualizations.

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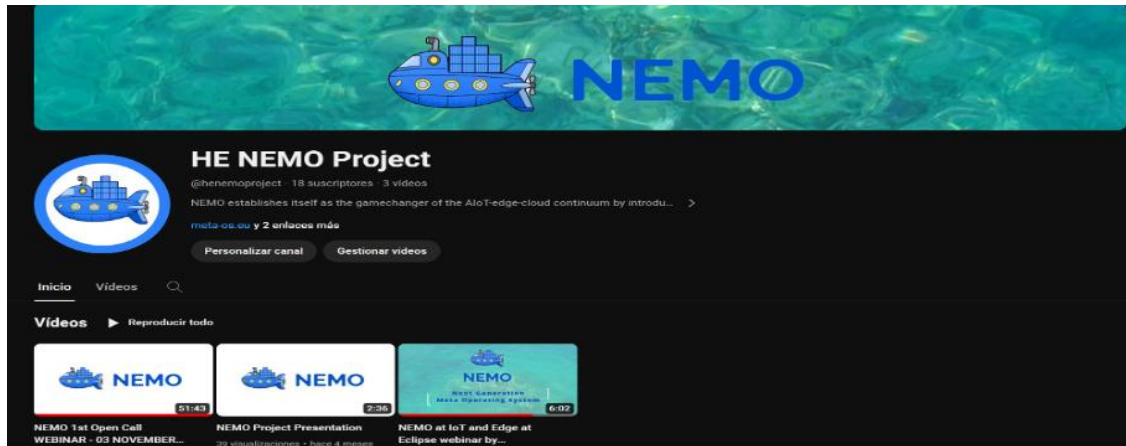


Figure 7: - YouTube channel

Zenodo (<https://zenodo.org/communities/he-nemo/?page=1&size=20>) is a research data repository that provides a platform for researchers, scientists, and developers to store, share, and cite their research data. The NEMO project is using Zenodo to store and share all project deliverables and outputs, including research papers, reports, and datasets.

2.6 Participation in Events

This section includes the following table that summarizes the events where the project has participated in the past. The table provides information about the event, including the date, and a brief description of the project's contribution.

ID	Resp.	Type	Title	Contribution	Organizers	Date
1	SYN, ATOS	Cluster Meeting	Introduction one-to-one call with UNLOCK CEI to understand the tech to be developed and ambition related to market-readiness.	NEMO presentation	UNLOCK CEI	October 21st 2022
2	ECL	Conference	EclipseCon 2022	Research Booth	Eclipse	October 24-27th 2022
3	ATOS, SYN	Workshop	aerOS Workshop on State of Art and Market Analysis	Attendance	AerOS Project	November 29th 2022
4	SYN	Webinar	IoT, Cloud, Edge Computing Continuum From Research to Deployment	NEMO Smart Farming presentation	AIOTI/EUCloudEdgeIoT	November 30th 2022
5	OTE	Conference	24th Infocom World Conference	NEMO presentation	OTE	November 30th 2022

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ID	Resp.	Type	Title	Contribution	Organizers	Date
6	SYN, ECL	Webinar	IoT and Edge at Eclipse: Making Sense of the Puzzle	NEMO presentation	Eclipse and EUCloudEdgeIoT CSA	December 7th 2022
7	SYN	Workshop	LeADS Advanced Digital Skills Workshop	Attendance and participation	LeADS CSA	December 15th 2022
8	SYN	Cluster Meeting	EUCloudEdgeIoT TF4 and TF5 Kick-off meeting	NEMO use cases contribution	EUCloudEdgeIoT CSA	January 16th 2023
9	SYN, UPM	Info Day	Horizon Europe Info Day and Pitch Session on the Work Programme 2023-2024, destination “World leading data and computing technologies”	Questionnaires sent from UPM. SYN will attend the event.	EC, OpenContinuum CSA	January 30th 2023
10	SYN, UPM	Cluster Meeting	Concertation Meeting across all research and innovation projects in the Cloud-Edge-IoT community, to exchange ideas and find common views on research topics, challenges, and gaps for the next 2-4 years	Questionnaires sent from UPM.	EC, OpenContinuum CSA	February 8th 2023
11	ECL, UPM	Congress	Embedded World 2023, Nuremberg	Booth	Embedded World	March 14th-16th 2023
12	ECL	Congress	Concertation and Consultation on Computing Continuum: From Cloud to Edge to IoT	Pitch Session	EUCloudEdgeIoT The Claridge, Brussels (Belgium)	May 9, 2023 - May 11, 2023
13	OTE	Conference /workshop	19th International Conference on Artificial Intelligence Applications and Innovations (AIAI 2023)/ 8th 5G-PINE Workshop	Paper Presentation acknowledging NEMO.	Democritus University of Thrace (D.U.Th.), University of Piraeus, Universidad de León	14 – 17 June, 2023
14	ECL, UPM	Conference	Eclipse SAAM 2023	Conference Organization	Eclipse, UPM & UoM	October 2023

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ID	Resp.	Type	Title	Contribution	Organizers	Date
15	OTE	Conference	eSAAM 2023 on Cloud-to-Edge Continuum	NEMO concept paper submission & presentation	Eclipse	October 17th, 2023, Germany
16	OTE	Conference	25th Infocom World Conference	NEMO tutorial		December 14th 2023
17	UPM	Conference	HiPEAC 2024, High Performance, Edge and Cloud computing	Contribution to the discussion	HM Hochschule München University of Applied Sciences	January 17-19 2024

Table 4: NEMO event participation

2.6.1 AIAI 2023

In the context of the 19th International Conference on Artificial Intelligence Applications and Innovations (AIAI 2023)¹ that took place in Leon, Spain, in June, the Hellenic Telecommunications Organization S.A. (OTE) presented a paper, acknowledging the case of the NEMO project.

The paper, titled “Putting Intelligence into Things: An Overview of Current Architectures”² was presented at the distinguished 8th 5G-PINE Workshop. This workshop was held in conjunction with the 19th International Conference on Artificial Intelligence Applications and Innovations (AIAI 2023) and has joined the section of several participating workshops³. The overarching objective of the workshop was to serve as a platform for disseminating knowledge derived from ongoing European Union (EU) projects, including among others the noteworthy contributions from the NEMO project. The thematic focus of the workshop centred around “5G Innovative Activities – Putting Intelligence to the Network Edge”, with a particular emphasis on Artificial Intelligence (AI) within 5G telecommunications infrastructures.

¹ <https://aioti.eu/aioti-signature-event-2023/>

² https://link.springer.com/chapter/10.1007/978-3-031-34171-7_8

³ <https://link.springer.com/book/10.1007/978-3-031-34171-7>

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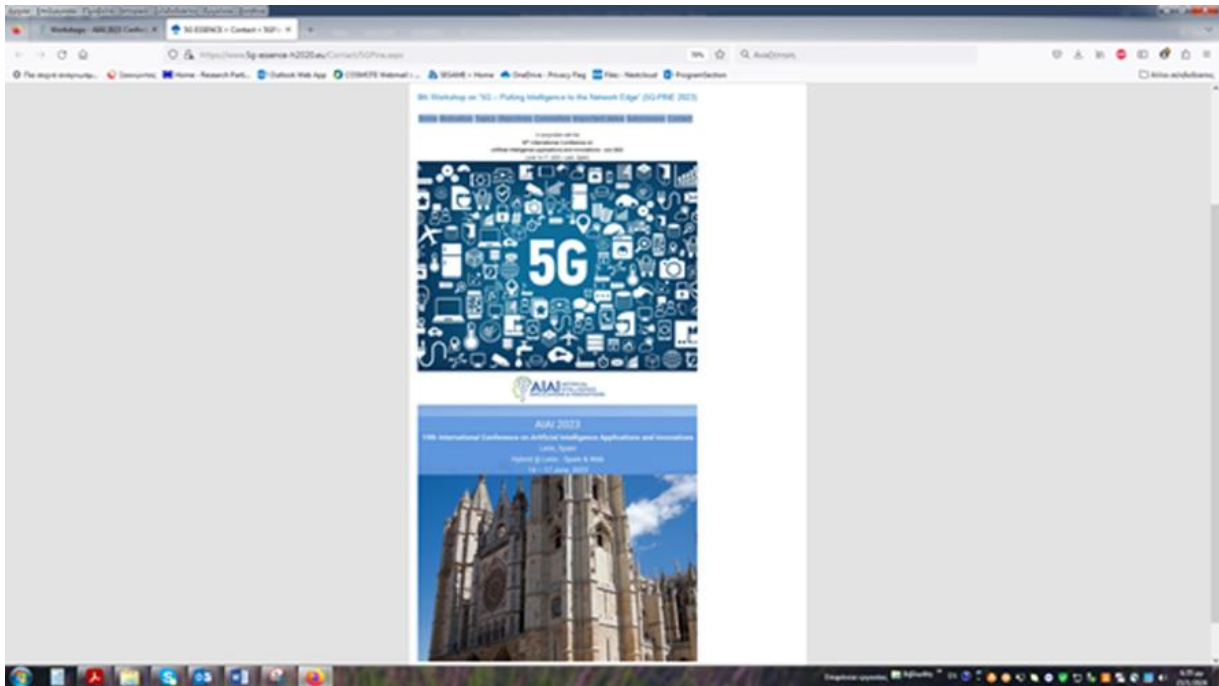
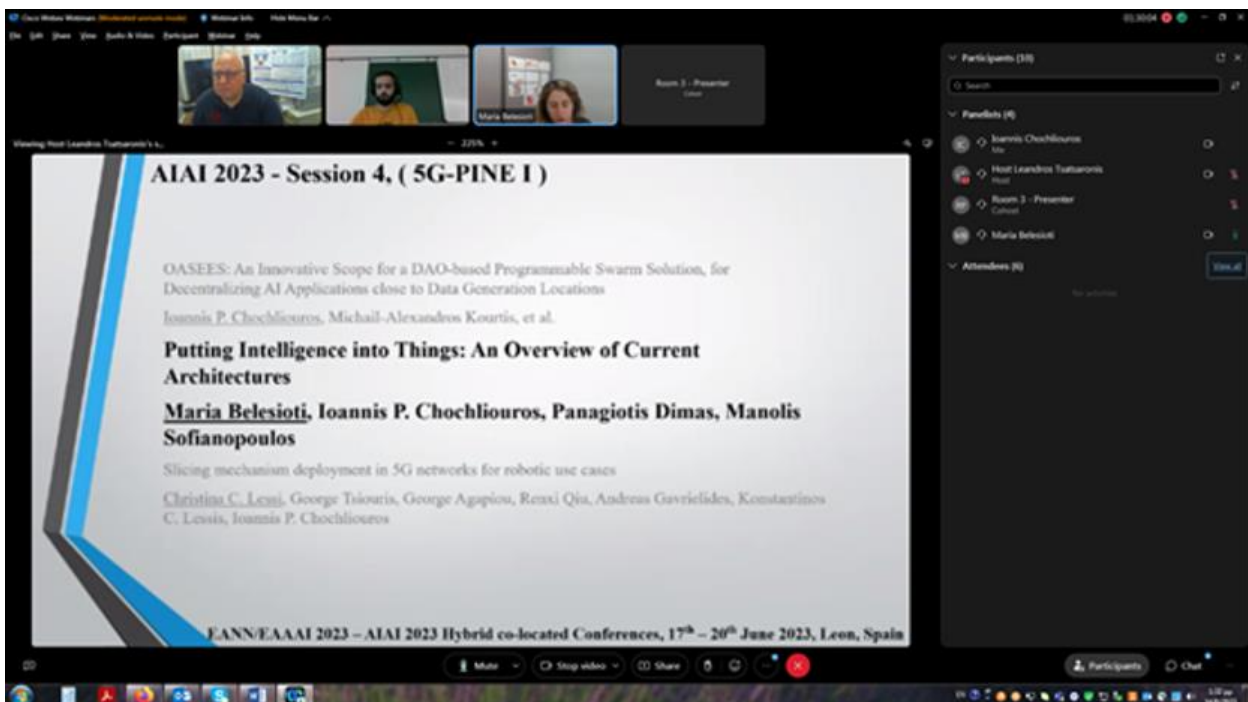


Figure 8: - Screenshot from the 8th 5G-PINE Workshop in AIAI 2023

The presentation sustained by the Hellenic Telecommunications Organization within this setting underscores the significance of the NEMO project within the broader context of cutting-edge research and development in the field of IoT and Artificial Intelligence.



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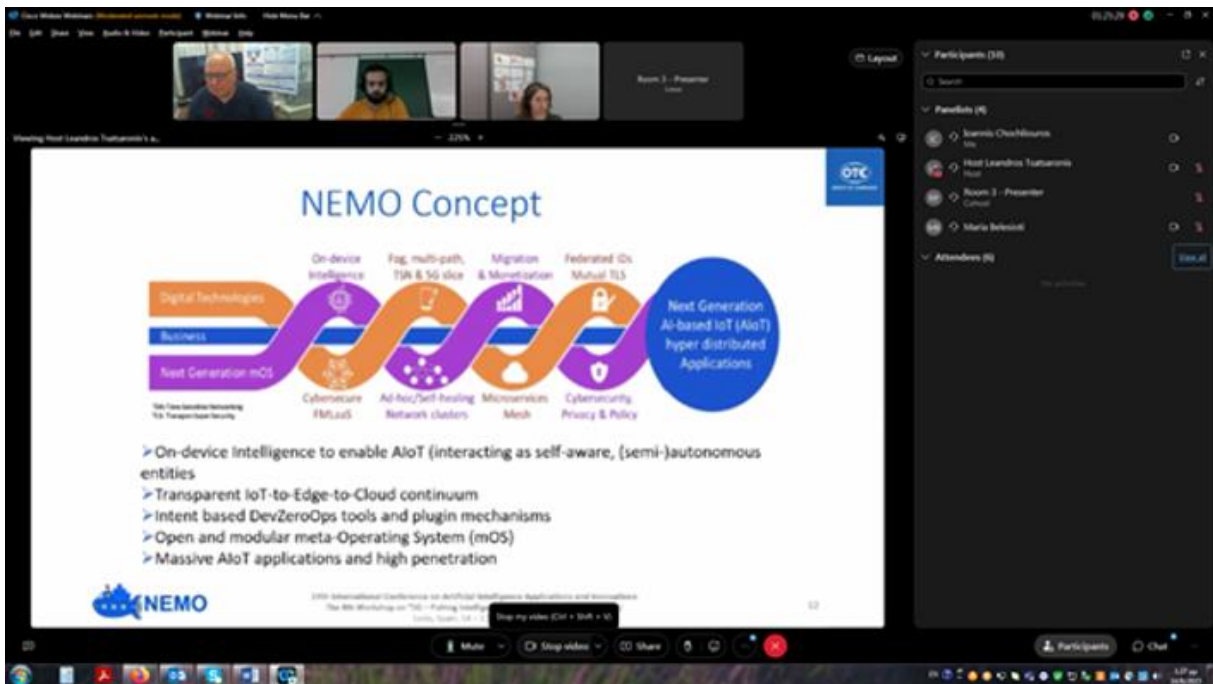
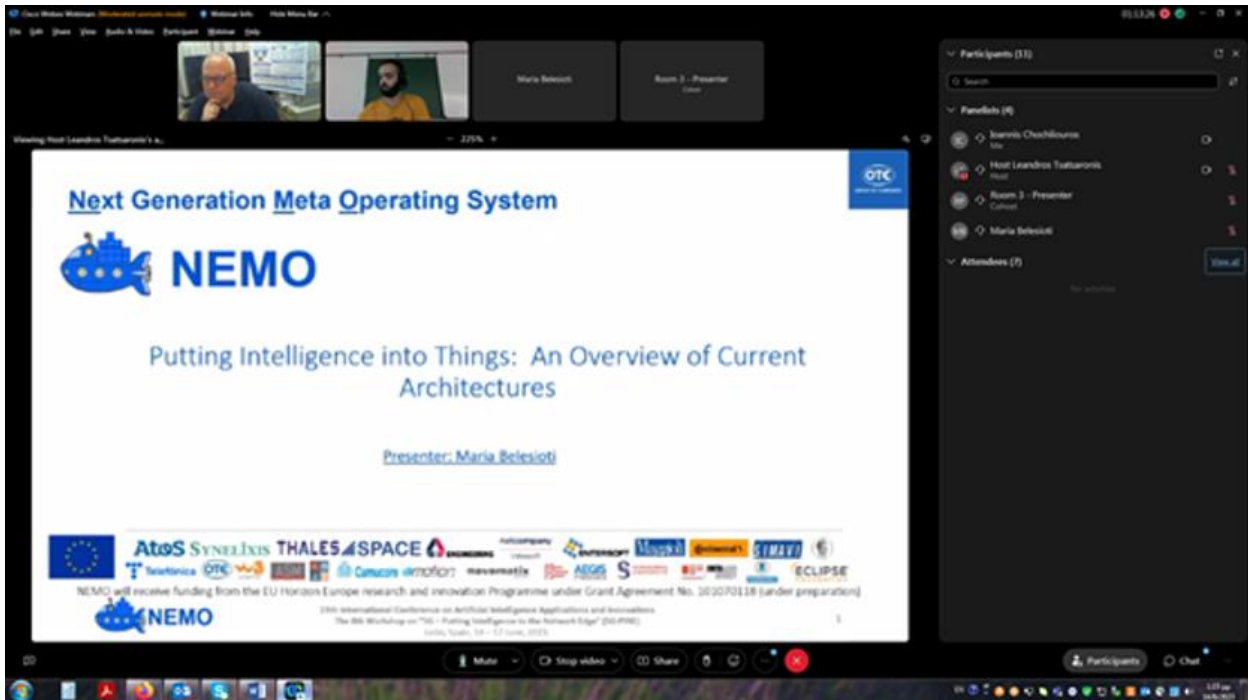


Figure 9: Screenshots from NEMO’s paper presentation in the 8th5G-PINE Workshop (in AIAI 2023)

2.6.2 eSAAM 2023

The NEMO project actively participated in the “3rd Eclipse Security, AI, Architecture, and Modeling Conference on Cloud to Edge Continuum”⁴ (“eSAAM 2023 on Cloud-to-Edge Continuum”), which

⁴ <https://events.eclipse.org/2023/esaam2023/>

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transpired on October 17th, 2023, in Ludwigsburg, Germany. This conference was co-located with ECLIPSE CON 2023⁵ providing a platform for the convergence of industry experts and researchers dedicated to pioneering software and systems solutions for the imminent era of the Cloud-to-Edge continuum. The focal points of discussion revolved around Security and Privacy, Artificial Intelligence (AI) and Machine Learning (ML), Systems and Software Architecture, Modelling and their associated challenges.

Throughout this one-day event, the NEMO Project gained attention through a dedicated presentation entitled as “*NEMO: Building the Next Generation Meta Operating System*”⁶. The presentation was delivered by Dr. Ioannis Chochliouros, representing OTE Group of Companies, one of the partners of the NEMO Project who also led the common paper effort. The presentation not only highlighted the substantial contributions of the NEMO Project but also elucidated its role in shaping the trajectory of the next generation Meta Operating System.

The event served as an invaluable forum for disseminating knowledge, fostering collaborative endeavours and advancing the discourse on the burgeoning Cloud-to-Edge continuum.



Figure 10: Highlight from NEMO’s paper presentation in eSAAM 2023

⁵ <https://www.eclipsecon.org/2023>

⁶ “*NEMO: Building the Next Generation Meta Operating System*”, E. Pages-Montanera, A. Alcázar-Fernández, T. Zahariadis, T.-H. Velivassaki, C. Skianis, R. Rossini, M. Belesiotti, I.P. Chochliouros, N. Drosos, E. Bakiris, P. Kumar., P. Karkazis, A. Samal, L.M. Contreras, A. del Rio, J. Serrano, D. Skias, O. Segou and S. Wächter. In Proceedings of the 3rd Eclipse Security, AI, Architecture and Modeling Conference “On Cloud to Edge Continuum” (eSAAM-2023), *October 17, 2023*, Ludwigsburg, Germany. Association for Computing Machinery (ACM), New York (NY), US, pp.1-9. ISBN:979-8-4007-0835-0. DOI: <https://doi.org/10.1145/3624486.3624504>

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Legend

- Keynote
- Session
- Sponsor
- EclipseCon

Morning Afternoon

Session Name	Presenter Name	Scheduled Time
Introduction and Welcome	A. Chatzigeorgiou, Ph. Krief	09:00 - 09:10
● Spurring edge innovation through Open Platforms'	Rolf Riemenschneider	09:10 - 09:25
● NEMO: Building the Next Generation Meta Operating System 🔗	Ioannis Chochliouras	09:25 - 09:45
● Scalable and Portable Federated Learning Simulation Engine 🔗	Borja Arroyo Galende	09:45 - 10:05
● Cognitive Architecture for Process Industries 🔗	Peter Bednar	10:05 - 10:25
Break		10:25 - 10:45
● On the Containerization and Orchestration of RISC-V architectures for Edge-Cloud computing 🔗	Francesco Lump	10:45 - 11:05
● FlexConnect: Mobile Computational Offloading 🔗	Davide Taibi	11:05 - 11:25
● Unikernels Motivations, Benefits and Issues: A Multivocal Literature Review 🔗	Davide Taibi	11:25 - 11:45
● Lunch with EclipseCon	Bürgercafé 1	12:00 - 13:00

Figure 11: Agenda of eSAAM 2023



Figure 12: Participants of the eSAAM 2023

2.6.3 25th Infocom World Conference (“Diginvest in Greece: New Horizons!”)

The 25th Infocom World Conference, themed "Diginvest in Greece: New Horizons!" and held physically in Athens, Greece, on December 14, 2023 (<https://infocomworld.gr>), stands out as a pre-eminent event of ICT & Media Conferences in South-Eastern Europe. This annual conference, renowned as the "greatest ICT & Media Conference in South-Eastern Europe," featured a diverse program that

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included parallel workshops and sessions, each addressing specific facets and challenges within the information and communication technology landscape.



Figure 13: View of the 25th Infocom World 2023 (infocom media + ai World)

With a line-up of highly influential speakers, Infocom World 2023 was once again a “meeting place” for industry leaders, researchers, policymakers and entrepreneurs, showcasing the transformative potential of connectivity and the future of Telecommunications and IT, with a particular focus on next-generation networks, their applications, cybersecurity, the path to the future and 6G.

The full-day research-oriented workshop titled "*Modern Research and Development Projects: Creating the Pillar for Investment and Innovations in the ICT Converged (Vertical) Markets*"^{7,8} organized by the Hellenic Telecommunications Organization S.A. (OTE) assumed particular significance. Comprising twelve (-12-) thematic sessions with a total of forty-three (-43-) distinct presentations, this workshop aimed to showcase the scope and outcomes of various 5G EU-funded projects while identifying future growth opportunities. Conceptual interactivities and commonalities among the thematic contexts of these sessions underscored the strategic alignment with ongoing E.U. initiatives, such as the 5G-PPP/H2020 and Horizon Europe/SNS framework.

Twenty-eight (-28-) European projects have been discussed interactively, while there were six (-6-) sessions with more than one presentations dedicated to a specific European project.

The above Workshop aimed to deal with several potential challenges rising from ongoing EU-funded research (i.e., either specific projects and/or wider innovative frameworks) allowing to identify, describe, evaluate and assess corresponding network and services solutions, especially from the 5G/5BG operational framework, that will boost the telecommunications market as

⁷ https://infocomworld.gr/25o-synedrio-infocom-world-2023-diginvest-in-greece-new-horizons/_epistimoniki-enotita-overview/

⁸ https://infocomworld.gr/25o-synedrio-infocom-world-2023-diginvest-in-greece-new-horizons/_epistimoniki-enotita-programma/

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well as other relevant vertical markets to higher levels. In parallel, this is expected to create a framework for realizing investments and promoting innovation, for the benefit of all involved end-users (corporate, residential, State Authorities, organizations and many more)⁹

A notable focal point of the discussions was the rapid expansion of the Internet of Things (IoT), projecting significant growth by the end of the current decade. This transformative “shift” in the intersection of digital technology with human life anticipates the emergence of the Artificial Intelligence of Things (AIoT), where Artificial Intelligence integrates seamlessly with our connected world. However, realizing this vision poses challenges, particularly in ensuring real-time, secure, and trusted support from edge cloud systems coupled with artificial intelligence.

Under this framework, **Session 11**, delved into the discourse surrounding potential meta-Operating Systems (mOS) for supporting the AIoT–Edge–Cloud Continuum, drawing insights from ongoing European projects such as aerOS (<https://aeros-project.eu/>) and NEMO¹⁰. The discussion also extended to assess aspects originating from the TALON Project¹¹.

Artificial Intelligence of Things (AIoT) is a pivotal concept poised to drive societal changes and economic growth, representing one of the fastest-growing segments in ICT. A specific challenge lies in leveraging existing technological strengths to develop solutions that uphold European industry and values. The ongoing NEMO ("Next Generation Meta-Operating System") EU-funded Project positions itself as a potential game-changer in the AIoT-Edge-Cloud continuum. It aims to introduce an open-source, modular, and cyber secure meta-operating system, incorporating existing technologies and pioneering novel concepts, methods, tools, testing, and engagement campaigns.

NEMO's objectives encompass bringing intelligence "closer to the data" and integrating "AI-as-a-Service" as an integral part of network self-organization and micro-services execution orchestration. The project's widespread adoption is envisaged through technology innovations, pre-commercial exploitation components, and collaboration with open-source communities.

NEMO's innovative contributions extend across various protocol stack layers, enabling on-device cyber secure Federated ML/DRL (Deep Reinforcement Learning). Its design incorporates state-of-the-art mechanisms such as Mutual TLS (Transport Layer Security) and Digital Identity Attestation, ensuring cyber secure and trusted operations. Validation efforts will span five prominent industrial sectors (farming, energy, mobility/city, Industry 4.0, and media/Extended Reality (X.R.)) and involve eight use cases in six Living Labs, utilizing over thirty heterogeneous IoT devices and 5G infrastructure. The anticipated impact on the data economy and vertical applications is expected to be substantial.

The corresponding presentation has jointly prepared by Dr. Ioannis Chochliouros and Mrs. Maria Belesioti (Hellenic Telecommunications Organization S.A. (OTE)).

Figure 14 below, provides some screenshots from these presentations and the related material.

⁹ Information about the Workshop can also be found at the following links: <https://www.facebook.com/InfoCom.gr/posts/pfbid02E6jWW17X3x1Pnv8KT58qybV4RE8zkULTKLzucgyLri79mDNK3ueNmc4xVPLWnZQbl>; and also <https://www.linkedin.com/feed/update/urn:li:activity:7147953291388264449>

¹⁰ On-line presentations can be found at: <https://youtu.be/tHPb02CCif0>


¹¹ For further information also see: <https://talon-project.eu/>

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Figure 14: NEMO presentation in Session 11 of OTE’s Full Day Research Oriented Workshop (December 14, 2023) in the framework of Infocom World Conference 2023

For this event, OTE also published an announcement in the internal corporate site (only in Greek) where the synergies with other EU projects are also depicted.



H Προεδρευόμενη Επιτροπή Έρευνας του Ομίλου ΟΤΕ διοργανώνει Επιστημονικό Συμπόσιο με τίτλο "Modern Research and Development Projects: Creating the Pillar for Investment and Innovation in the ICT Converged (Vertical) Markets", στο πλαίσιο του 26ου Συνεδρίου Infocom World 2023, που πραγματοποιείται την Τετάρτη 14 Δεκεμβρίου 2023.

Το πλαίσιο της ημερίδας θα είναι αφιερωμένο στην προώθηση για τη μελέτη σε νέα θέματα και υπηρεσίες, καθώς από μία τεχνολογική οπτική, όπως αναγράφεται από διάφορα έρευνες σε ανάπτυξη, οι ημερίδες αναμένεται να 12 διακριτά βιολογικά, γίνονται, τόσο για να παρέχονται οι τεχνολογικές, καθώς και αποτελεσματικά από τεχνολογικά εργαλεία ημερίδας, όσο και για τις επόμενες προκλήσεις για ανάπτυξη στην περιοχή αυτή, σύμφωνα με διεθνείς απαιτήσεις και τεχνολογικές, όπως διακριτά ενδοεπιχειρήσεις. Οι 12 επίσημες ομιλίες σε τεχνολογικά εργαλεία είναι στο πλαίσιο του Ομίλου ΟΤΕ:

- OASIS
- SmartSaaS
- DATAMATE
- NIMCY
- 8G-SPRICKS
- MARSAI
- NO BEAGLE
- AMBIENTUS
- PHOENIX
- TRACY
- CyberSaaSZone
- NO-ERA
- VITAL-DS
- TRACE
- ALLIOPRO
- AI-OS
- NEMO

Στα πλαίσια αυτής 43 τεχνολογικών, επηρεασμένων, δράσεων από 24 προηγμένα έργα κοινότητας, βέλτετα βέλτετα αποτελέσματα σε έρευνα, ανάπτυξη, όπως τεχνολογικά εργαλεία, που είναι η συνδυαστική δράση από κεντρικά επιχειρήσεις (R&D) συνδυαστικά με την περιοχή Τεχνολογική Κοινωνία (R&D). Το πρόγραμμα της ημερίδας είναι διαθέσιμο [εδώ](#).

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3 Standardization

NEMO will follow the Standardization Strategy already developed by the European Commission for a greener and more digital economy within the Single Market¹². There are five main activities to be performed according to this:

- Support innovation at all levels.
- Leverage Europe as a reference in global standards.
- Improve the European standardization system.
- Identify, prioritize and address gaps in strategic areas.
- Enable the next generation of experts.

According to this, NEMO structures its own strategy within 2 main pillars:

1. **Used standards.** During the development life cycle NEMO will make use of some standards or de facto standards. All of them will be collected and promoted in terms of interoperability to maximize industrial uptake. But also, a close monitoring will be performed in order to identify any gap. This will be notified to the corresponding body. Furthermore, if during this phase, NEMO develops any solution that may cover this gap, this will be also notified to the corresponding body as a Request for Contribution to it.
2. **Standards watch.** NEMO will also investigate any related standard, even if it is not being used within the project, to identify any gap or potential contribution from project results. The process for doing so will be the same one as in the previous point.

Additionally, NEMO is participating in Task Force 3 Architecture within the EUCloudEdgeIoT initiative¹³. The objective of this task force is to homogenize the European technical perspective for the Continuum. NEMO will take an active role in the development of a common taxonomy to be used by all research projects, further mapped with other relevant initiatives. This taxonomy is expected not only to be used but also to be promoted as a European standard.

3.1 Phase 1 Used standards

All core components of NEMO will be developed based on an Open standards-based Reference Architecture and interfacing open standards.

In NEMO, different standards have been identified for one of the interoperability in the platform. In fact, to facilitate interoperability NEMO data and metadata will follow:

- micro-services' interoperability including standardization attempts: ISO/TC268, ISO/IEC JTC1, ITU-T SG 20; ad-hoc standards: oneM2M, OCF, OMA LWM2M, FIWARE.
- Standards compliant format: Dublin Core Metadata Initiative, DCMI; to address the interoperability requirement with other data sources in the linked data environment.
- Standards vocabulary: DCMI uses natural language definitions that can be instantly converted into open machine-readable formats such as XML and JSON.
- Design standards-based on digital data models and ontologies: use/extend WMO Codes Registry or GRIB Discipline Collection ontology.

In particular, in Figure 15, we identify a list of SDO to follow related to the cloud/edge as starting point. This list will be extended with the ones relevant nowadays for our NEMO project.

¹² <https://ec.europa.eu/docsroom/documents/48598>

¹³ <https://eucloudedgeiot.eu/>

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Topic	Standard analysed
Virtualization	DMTF OVF ISO/IEC 17203 DGS/NFV-IFA040 - DGR/NFV-IFA038 - DGR/NFV-IFA036 ISO/IEC TR 23188
Architecture	ISO/IEC 17889 ISO/IEC 22624
Dataflow	ISO/IEC 19944
Security	ISO/IEC 2700x EUCS ISO/IEC 19086-4 ITU-T X.1605/1604 ISO/ IECTR 3445 ISO/IEC TR 23186
Interoperativity and portability	ISO / IEC 19941 OASIS CAMP OASIS TOSCA ISO/IEC 22624 ISO/IEC NP TR 23187
SLA	ISO/IEC 19086-1 ISO/IEC 19086-2 ISO/IEC 19086-3
Storage	ISO/IEC 17826
Edge	ITU-T Y.4122
Billing/Metering	ISO/IEC PDTR 23613

Figure 15: Main standards on cloud/edge selected by NEMO

Moreover, for the first phase, all the partners have identified the main standards that are listed in Table 5.

Name of the standard	Partner	Small Description	How is used/foreseen in NEMO
3gpp TS 28.312 ¹⁴	TID, UC3M, ATOS, SYN	Technical specification for intent-driven management in mobile networks	Intents' definition based on the TS in mNCC, meta-Orchestration and Intent-based API
ISO/IEC/IE EE 42010:2022 ¹⁵	SPH, SYN	Systems and software engineering — Architecture description	It was the primary point of reference for the specification of the NEMO Meta-Architecture Framework (MAF) Description (D1.2)
ISO/IEC 22123 ¹⁶	SPH, SYN	It specifies the cloud computing reference architecture (CCRA). The reference architecture includes the cloud computing roles, cloud computing activities,	It was used as a basis for the specification of the NEMO meta-OS architecture (D1.2).

¹⁴ <https://portal.3gpp.org/desktopmodules/Specifications/SpecificationDetails.aspx?specificationId=3554>

¹⁵ <https://www.iso.org/standard/74393.html>

¹⁶ <https://www.iso.org/standard/82759.html>

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Name of the standard	Partner	Small Description	How is used/foreseen in NEMO
		and the cloud computing functional components and their relationships.	

Table 5: Standards used by NEMO.

3.2 Phase 2 Standards Contribution

Planning and monitoring on standards in NEMO project are one of the objectives of the consortium that will adhere to existing standards and potentially contribute to emerging standards in IEC & ISO committees. NEMO defines sustained availability of NEMO’s code not only as means to prevent decay of NEMO capabilities over time, but also to empower uptake and continuously update in line with the newest technological developments and standards.

During the first period of NEMO project, two big contributions on the standards have been made and detailed in the following.

- Contribution 1:** Y. Lee, X. Liu, L.M. Contreras, “DC aware TE topology model”, draft-llc-teas-dc-aware-topo-model-03 (work in progress), July 2023 (<https://www.ietf.org/archive/id/draft-llc-teas-dc-aware-topo-model-03.txt>). Relation to NEMO: This draft proposes a YANG model for describing the compute resources connected to a network topology. This can be used for upper control and management systems in order to select the more convenient edge/cloud environments for deployment of workloads taking into consideration not only compute capabilities but also networking ones in terms of traffic engineering.
- Contribution 2:** L.M. Contreras, M. Boucadair, D. Lopez, C.J. Bernardos, “An Evolution of Cooperating Layered Architecture for SDN (CLAS) for Compute and Data Awareness”, draft-contreras-coinrg-clas-evolution-01 (work in progress), July 2023 (<https://www.ietf.org/archive/id/draft-contreras-coinrg-clas-evolution-01.txt>). Relation to NEMO: This draft proposes an architecture for inter-related control and management capabilities for services, connectivity and compute environments, where planes for control, resources and data (focusing AI/ML) are interconnected and collaboratively interacting. One of the scenarios of applicability is the cloud-edge continuum case.

These two drafts were presented in IETF 117 meeting in July 2023 in their respective working groups. The work will be continuously improving for these drafts, possibly considering additional contributions in other fronts with relation to NEMO.

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4 Communities Liaison

This section presents the communities liaison plan and the strategy adopted by the consortium to sustain the project results as well as the objectives, their selection criteria, the actions the consortium are putting in place to achieve these objectives.

The aim of the dissemination is to communicate the results, get to know the project, and build a strong network and interest in the NEMO project. On top of this, NEMO project can start building a community. Once the dissemination and the community building have played their role, the community liaison is the key to start creating the sustainability of the NEMO project.

For this reason, the consortium is in relationship with several business and development communities. Each of these communities provides us the opportunity to present and be challenged on the different facets of our project.

This section describes the past, current, and coming actions in liaison with these communities.

4.1 Open Source and Community Building Strategy

The complete NEMO solution will be provided as open source software via Eclipse foundation, accessible via well documented Open APIs that will provide transparency on the mOS operation. Additionally, exploiting the Open Calls, 3rd party participants will have the opportunity to use and experiment with NEMO, build their vertical applications and extend the ecosystem.

The activities performed, looking at the key aspects of the open source and community building strategy:

- to create an environment that allows for open collaboration and implementation of open source best practices right from the start.
- to implement sufficient IP management
- to draw and keep track of the open source landscape of the project.
- to lay out measures for community building, sustainability and long-term governance.

During the first period of the project, a set of high-priority communities who are relevant in terms of open source have been identified. In the following we briefly describe each community and their relevance for NEMO's open source ambitions, and the activities performed to establish relationships between these communities and NEMO.

4.1.1 Gaia-X

GAIA-X is a European private sector initiative for developing an open, federated and interoperable data infrastructure built on top of digital sovereignty.

In this context, ATOS is a founding member of the global initiative and member of the Spanish Hub. Thus, ATOS will perform a close follow up of the ongoing work in the different working groups in order to identify areas where NEMO can contribute with its results.

4.1.2 AIOTI

RWTH will push NEMO use cases at AIOTI WG 12: Smart Energy, CONTI to WG 11: Smart Manufacturing and SYN to WG 06: Smart Farming, aiming to engage early adopters, find prominent users and develop joint activities.

4.1.3 DAIRO/BDVA

DAIRO is the updated version of the BDVA community, now including not only data, but also AI and robotics within its target. ATOS is member of this community.

There are several ways of contributing to it, being the most relevant at this stage the participation in the EBDVF, as the reference annual event, where NEMO can organize or co-organize a workshop to show

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results in front of a multidisciplinary audience; or even participate within the BDVA Marketplace to offer tailored solutions for its community.

4.1.45GPPP

Partners can heavily leverage the NEMO framework to set the roots for the coming 5G and Smart Networks and Services industrial partnerships as a key enabler of a trustworthy, resilient, sustainable and open next generation IoT.

Liaison with 5G PPP projects:

NEMO will actively collaborate with other 5G PPP and non - 5GPPP projects. Several NEMO partners have been or are actively involved in 5G PPP Phase 1, Phase 2, and Phase 3 projects, and have long track record in establishing fruitful liaisons with other projects. As a matter of fact, NEMO builds up on the knowledge gained from previous work that the consortium has performed as part of the aforementioned projects.

The liaisons that will be established, will ensure a successful collaboration and a smoother integration of technologies and concepts.

TSG is co-chairing the 6G-IA security working group. The aim of this working group is to work in a coordinated manner on 6G security in areas of shared interest such as 6G security, 6G security architecture, while taking advantage of recent advances in all relevant disciplines for instance AI. Through its active participation, TSG will disseminate, present, and promote the research results of NEMO targeting cloud native security, and AI based security.

4.1.5NGI

NEMO is strongly aligned with the NGI core values and intends to collaborate in NGI community activities, such as outreach, event organisation and webinars.

4.1.6Eclipse IOT and Edge working groups

Eclipse Working Groups provide a vendor-neutral governance structure that allows organizations to freely collaborate on new technology development. The Eclipse Foundation, through Eclipse Working Groups, provides five basic services to enable these types of collaborations:

- **Governance:** Good governance that controls how decisions are made, policies established, and disputes resolved is important for any successful collaboration.
- **Intellectual Property Management and Licensing:** Collaborations among different organizations require due diligences on the co-developed intellectual property. Eclipse Working Groups are established under the Intellectual Property (IP) policies of the Eclipse Foundation. These policies ensure that any open source software created in Eclipse projects is available for use by anyone, including developers of commercial software products.
- **Development Processes:** The Eclipse community has created a successful development process for large-scale distributed development that involves many different organizations.
- **IT Infrastructure:** The Eclipse Foundation manages the IT infrastructure for Eclipse Working Groups, including Git code repositories, Bugzilla databases, Hudson CI servers, development-oriented mailing lists and newsgroups, download sites, and websites.
- **Ecosystem Development:** An important way that the Eclipse Foundation supports the community is through active marketing and promotion of Eclipse Working Groups and the wider Eclipse ecosystem.

Among all the Eclipse Working group, NEMO identified the Eclipse IoT Working Group as the most relevant for the topic. In particular, Eclipse IoT Working Group (<http://iot.eclipse.org>) is an ecosystem of companies and individuals that are working together to establish an Internet of Things based on open technologies. It provides open source implementations of the standards, services and frameworks that enable an Open Internet of Things. Today the Eclipse IoT Working group has:

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- 42 projects covering all the scope of the IoT from the device to the cloud, including gateway and edge devices;
- over 2.2 million Lines of Code;
- over 210 committers delivering the code;
- an average of 132K unique visitors per month.

Through newsletters and dedicated events, we will reach the Eclipse IoT community. Furthermore, the engagement with Eclipse IoT community has already started with the Open Continuum project, as detailed in the next subsection.

4.1.7 European Cloud, Edge & IoT Continuum cluster

NEMO has a strong collaboration with the European initiative called [European Cloud, Edge & IoT Continuum](#). In this respect, different Task forces have been created by European Cloud, Edge & IoT Continuum that aims to provide strategy and tools to promote the establishment of a European industrial Open ecosystem for continuum computing based on open-source and open standards as well as help project to enhance the sustainability of their results.

The previous activities have been detailed in the previous version of the deliverable and in section 2 as also a mean of dissemination and communication. More collaboration will follow with this European Cloud, Edge & IoT Continuum cluster.

The following activities have been performed to establish relationships between NEMO and these open source communities.

Name	Description	Partners involved	Impact	Date
EUCloudEdgeIoT Task Force 2 and 3 Workshop	Workshop between all MetaOS projects to draw a first open source landscape.	ECL, UPM, AT OS	Established initial relation with other MetaOS under the common interest of open source	Jan 18. 2023
Embedded World 2023	NEMO booth at the Eclipse Foundation booth.	ECL	Presentation to a broad audience.	Mar 13. - 15. 2023
Consultation & Concertation Meeting	NEMO presentation and Poster session	ECL, SY N	Presentation to a broad audience of 100 persons involved in EU projects + EU Commission	May 10- 11, 2023
Eclipse Con 2023	EclipseCon is the leading conference for developers, architects, and open source business leaders. NEMO at the Eclipse Research Booth.	ECL, UPM	Opportunity to present NEMO to the global Eclipse open source community.	Oct. 16. - 19. 2023
Webinars	In collaboration with EUCloudEdgeIoT Task Force 2, dedicated webinars have been organized	ECL	Opportunity to share needs among other EU projects.	Dec. 2023 March 2024

Table 6: Relationship activities between NEMO and open source communities.

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5 Conclusions

This document updates the foundations that the NEMO project is laying regarding Dissemination, Standardization and Communities Liaison. This second document describes the dissemination and communication activities, based on the most important events identified by the consortium that are carried out; the list of ongoing and upcoming actions and the impact of NEMO project.

In this document is also presented the Standardization activities in addition to the NEMO participation to the European initiative of European Cloud, Edge and IoT Continuum regarding the architecture aspect, the standardization and the open source communities. The standardisation objectives, their selection criteria, the action the consortium is putting in place to achieve these objectives will be always refined and checked during the project timeline. The document ends with a chapter dedicated to the community liaison overview related also to the actual dissemination plan.

As already stated above, this is the second document in a series of three, in fact, the last edition will cover the final results at month 36.

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- [3] <https://ifipaiai.org/2023/workshops/> This took place by emphasizing upon associated results, methodologies, trials, concepts and/or findings originating from technical reports/deliverables, from related pilot actions and/or any other relevant 5G-based applications, intending to enhance intelligence to the network edges.

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