Ref. Ares(2021)2905508 - 30/04/2021

TERMINET

Project No. 957406

Project acronym: TERMINET

Project title:

nexT gEneRation sMart INterconnectEd ioT

Deliverable 10.2

Plans for Publicity, Dissemination and Exploitation

Programme: H2020-ICT-2020-1
Start date of project: 01.11.2020
Duration: 36 months

Editor: INC

Due date of deliverable: 30/04/2021 **Actual submission date:** 30/04/2021

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 957406

Document Control Page

Deliverable Name	Plans for Publicity, Dissemination and Exploitation
Deliverable Number	10.2
Work Package	WP10
Associated Task	T10.1
Covered Period	M01-M06
Due Date	M06 – April 30, 2021
Completion Date	M06 – April 30, 2021
Submission Date	M06 – April 30, 2021
Deliverable Lead Partner	INC
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Version	**1.0**

Dissemination Level		
PU	Public	X
CO	Confidential to a group specified by the consortium (including the Commission Services)	

Document History

Version	Date	Change History	Author(s)	Organisation
0.1	01/03/2021	ToC Creation	Theodoros Rokkas (INC), Ioannis Neokosmidis (INC)	INC
0.2	31/03/2021	Integration of inputs	Dimitris Klonidis (UBITECH), Irida Manika (iSPRINT), A. Pnevmatikakis (iSPRINT), Stefanos Tsantilas (8BL),	UBITECH, iSPRINT UOWM, PPC, AUTH, SCHN, FINT, TEI, AFS,

			Panagiotis Sarigiannidis (UOWM), Nikos Papageorgiou (UOWM), Panagiotis Radoglou-Grammatikis (UOWM), Anna Triantafyllou (UOWM), Rahul Bobba (NEC), Armir Bujari (UNIBO), Evdokia Krystallidou (AFS), Cristina Regueiro, Iván Gutierrez, María Arostegi, Esther Villar, Juan López de Armentia, Conchi Cortés (TECN), Ioannis Neokosmidis (INC), Christos Dalamagkas (PPC)	WTG, 8BELLS, UNIBO, TECN, NEC, I2CAT, INC
0.3	07/04/2021	Integration of inputs	Miriam Cabrita (iSPRINT), Elisavet Grigoriou (SID), Theocharis Saoulidis (SID), Ioannis Neokosmidis (INC)	iSPRINT, MARTEL, SID, INC
0.4	14/04/2021	Inputs in several sections, version sent for review	Spyros Evangelatos (INTRA), Themistoklis Anagnostopoulos (INTRA), Eleni Trouva (INTRA), Stefanos Tsantilas (8BL), Konstantinos Georgakidis (MEVGAL), Dimosthenis Ioannidis (CERTH), Georgios Stavropoulos (CERTH), Andrea Damiani (FPG), Giuseppe Colloca (FPG), Luca Tagliaferri (FPG), Benedetta Gottardelli (FPG), Ioannis Neokosmidis (INC)	ALT, SID. CERTH, INTRA, 8BELLS, TECN, UOWM, LOGOS, ERCIM, MEVGAL, FPG, INC
0.5	29/04/2021	Comments from reviewers addressed.	Ioannis Neokosmidis (INC)	INC
0.6	30/04/2021	Comments from reviewers addressed.	Ioannis Neokosmidis (INC)	INC

0.7	30/04/2021	Quality and Risk Review	Dimosthenis Ioannidis (CERTH)	CERTH
1.0	30/04/2021	Final version, submission to EU	Ioannis Neokosmidis (INC)	INC

Internal Review History

Name	**Institution**	**Date**
Konstantinos Georgakidis	MEVGAL S.A.	28/04/2021
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Quality & Risk Manager Revision

Name	**Institution**	**Date**
Dimosthenis Ioannidis	CERTH	30/04/2021

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Acronyms

Acronym	Explanation
AI	Artificial Intelligence
AIOTI	Alliance for Internet of Things Innovation
BDVA	Big Data Value Association
EFFRA	European Factories of the Future Research Association
EMA	European Medicines Agency
GW	Gateway
IoT	Internet of Things
ISO	International Organization for Standardization
KPI	Key Performance Indicator
NFV	Network functions virtualization
RINA	Recursive Inter Network Architecture
RTU	Remote Terminal Unit
SDN	Software-defined networking
SDOs	Standardisation Development Organisations
SME	Small and medium-sized enterprises
TRL	Technology readiness levels
W3C	World Wide Web Consortium
WG	Working Group
WP	Work Package

Executive Summary

This deliverable presents the TERMINET dissemination, communication and exploitation strategy as defined in Task 10.1 - Publicity, Dissemination, and Clustering Activities of WP10 - Dissemination, Exploitation and Clustering Activities.

Various activities will be realized throughout the project's lifetime in order to help TERMINET achieve its dissemination objectives. Promotion of the project online and via participation in events (possibly online), organization of webinars, writing of news, producing high-quality promotional material as well as collaboration with other projects and relevant initiatives are essential planned activities.

The current report will act as a handbook for every project partner in order to perform their dissemination activities, as it lists all stakeholders, communication channels, dissemination activities and associated key performance indicators. To measure the achieved progress and impacts of the proposed strategy and plan, a monitoring and evaluation framework has been defined and a number of indicators have been recognized and reported.

Knowing that some activities might be impacted by the COVID-19 crisis even further, the plan will be monitored continuously, and corrective measures might be put in place.

A list of the exploitable items the current and expected technology readiness levels (TRL) along with the main partner is presented. The plan for joint exploitation and that of each partner are also presented.

Finally, a roadmap of standardization activities is presented.

1. Introduction

1.1 Purpose of the Deliverable

This deliverable is prepared under WP10: Dissemination, Exploitation and Clustering Activities and presents the plans for communication and dissemination, the exploitation strategy and the roadmap for standardization of the project results and achievements. These plans will be updated if needed in the upcoming deliverables D10.3, D10.4 and D10.5 that will report the impact created through the project dissemination, communication and exploitation activities. All these activities are part of Task 10.1 Publicity, Dissemination, and Clustering Activities that runs through the whole duration of the project.

The aim of the dissemination and communication plan is to create strong awareness of the project and its results, as well as to ensure that the knowledge and information gained can be made available to multiple target audiences at national, European, and global level.

1.2 Relation with other Deliverables and Tasks

The activities of WP10 receive inputs from all tasks and deliverables of the TERMINET project.

1.3 Structure of the Document

This deliverable is divided into the following sections:

- Section 2 presents the dissemination strategy: the objectives and the main stakeholders that must be reached through the planned activities.
- Section 3 presents the communication channels that will be used: the website, the social media accounts, the light content that will be created, the promotional material, the seminars and the clustering activities.
- Section 4 presents the dissemination plan, the opportunities for publications and participation in industrial events along with the individual dissemination plans.
- Section 5 presents the initial list of the exploitation strategy, the exploitable items, the exploitation plan and the individual exploitation plans.
- Section 6 presents a roadmap for the standardization activities.
- Section 7 present the Key Performance Indicators (KPIs) and the tools that will be used to monitor the impact of the dissemination, communication, and exploitation activities.

2. Dissemination strategy

The TERMINET dissemination strategy is structured in three main phases:

- "Phase 1 – Preliminary Project Promotion phase" aims at:
    - Creating the dissemination and communication strategy and the plans for future activities.
    - Creating initial awareness in the markets related to the Project's objectives and scope.
- "Phase 2 – Project Commercialization phase" aims at:
    - Creating more "targeted awareness" regarding TERMINET technologies with key players and potential users.
    - Informing the target market about the technological benefits of TERMINET.
- "Phase 3 – Business Strategy phase" aims at:
    - Maximizing target market and industry awareness regarding the TERMINET system.
    - Ensuring the project sustainability and full exploitation.

2.1 Objectives

The major focus of the TERMINET dissemination and communication plan is to ensure that the project activities and outcomes are widely spread among the appropriate target communities, at appropriate times, via appropriate methods. It should be pointed out that dissemination and communication activities and channels described in the following sections are intrinsically linked to the exploitation of the project results.

The dissemination strategy has the following objectives:

- To identify targeted stakeholders.
- To define the communication tools that will be used and develop the dissemination plan to increase the impact of the project.
- To create public awareness of the project and its results.
- To ensure that the knowledge and information gained will be made available to multiple targets at national, European and global level.
- To ensure that the project activities and outcomes are widely spread among the appropriate target communities, at appropriate times, via appropriate methods.
- To foster communication with other projects.

A general remark is that the planned activities that are provided in this initial plan may be altered as the project progresses. All the activities will be continuously monitored, while the associated plans will be updated to meet any new requirements that may be introduced or altered in the project duration. The updated plans will be reported in deliverables D10.3, D10.4 and D10.5.

Given the current situation due to COVIV-19 containment measures, a lot of events have been cancelled or turned into digital events. We will monitor continuously the latest developments regarding travel restrictions at EU and partners level and adjust the plan accordingly. We plan to enhance our online and digital presence to cover any shortcomings that may arise.

2.2 Stakeholder analysis

The main target groups of the TERMINET project as presented in Table **1** are:

- Industry/End-users. An open dialogue will be established via the project's website as well as through potential focus group meetings and open calls for TERMINET project to better address their needs and demands and to integrate their feedback at key points of the project.
- The scientific community, in artificial intelligence, machine learning, edge computing, blockchain technologies, etc. Partners will reach this community using their contacts and cooperation with other research projects, by participating in scientific conferences and publishing in scientific journals.
- Policy makers and national authorities have a key role in influencing strategic choices for IoT and consolidating technology evolutions. An open dialogue will be launched to highlight major aspects of TERMINET concept and receive feedback for further investigation.
- The general public. Less technical versions of project newsletters, leaflets, flyers, etc., will be available at project's website for the general public.

Table 1: Key Stakeholders

Industry – End Users	Scientific Community	Policy makers	
○ Electric power utilities (energy generators, energy distributors, operators) ○ Healthcare organizations (hospitals, clinics, etc) ○ Agriculture ○ Manufacturers ○ Industrial associations	○ Scientific communities of artificial intelligence, machine learning, edge computing, blockchain technologies etc. ○ Related EU-funded projects	○ EU Institutions (EU Commission, EU Science foundation) ○ Alliance for Internet of Things Innovation ○ National public authorities (industrial committees, ministry and regional councils, regulatory authorities)	**General Public**

3. Communication channels and tools

3.1 Branding

To establish a recognizable image for the project, a logo was designed at the beginning of the project and is presented in Figure 1. The logo will be used in all project activities: the website, presentation templates, deliverables, communication channels and all other material that will be produced from TERMINET.

Figure 1: TERMINET logo

A template for presentations was created in PowerPoint. This will be used for presentations at both internal and external events, meetings etc. Thus, the project image will be further enhanced, and all presentations will have a common look and feel. A sample of the template is presented in Figure **2**.

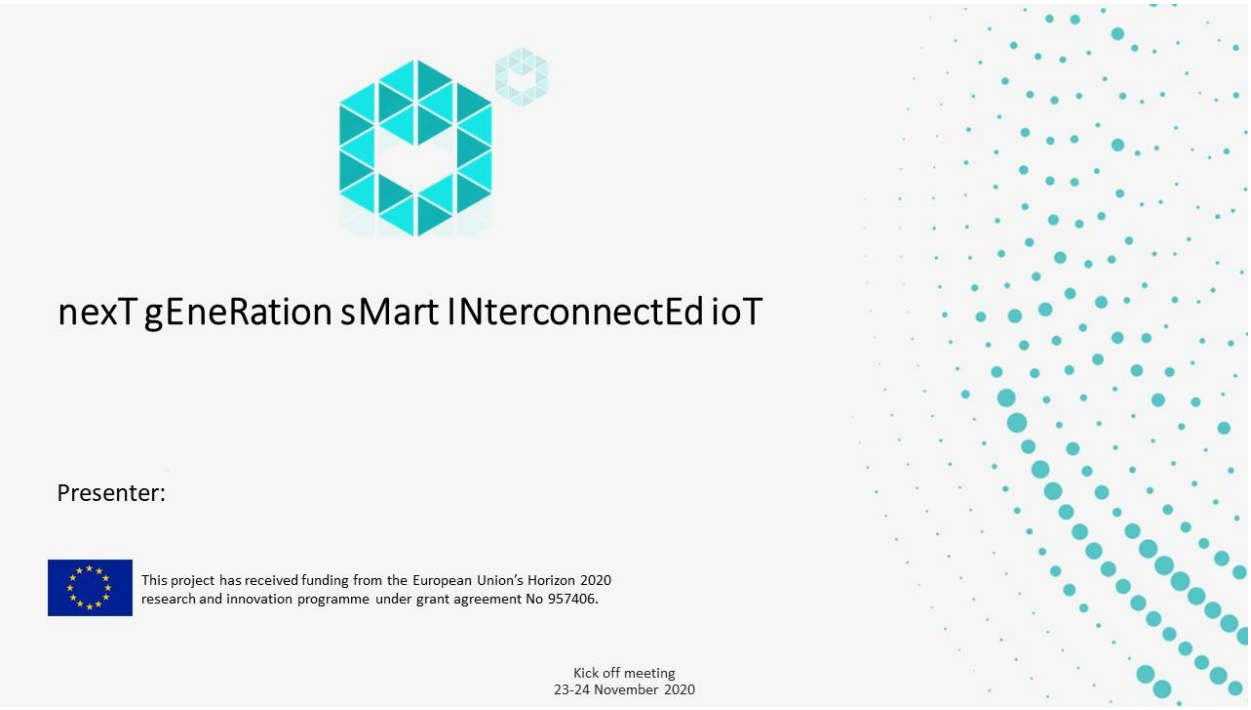

Figure 2: TERMINET Template for presentations

A template for the deliverables of the project has been produced following the guidelines of the European Commission (EC) and presented in Figure **3**. The cover page includes the project acronym and logo, contract number, start date and duration, deliverable numbering and title. The second page of the template contains information about the associated work package, the lead partner, the authors, the dissemination level and the versioning. Each deliverable will have the following general sections: Table of Contents, List of Figures, List of Tables, Main Document sections, References and Acronyms.

TERMINET

Project No. 957406

Project acronym: TERMINET

Project title:

nexT gEneRation sMart INterconnectEd ioT

Deliverable x.x

Deliverable Title

Programme: H2020-ICT-2020-1
Start date of project: 01.11.2020
Duration: 36 months

Editor: xxx

Due date of deliverable: Xx/yy/zzzz **Actual submission date:** Xx/yy/zzzz

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 957406

Figure 3: TERMINET Template for deliverables

3.2 Website

The website will be the main tool for disseminating and communicating the project activities. Its main purpose is to inform the different stakeholders about the project and become an important source of information for both general public and experts in the area.

All the news regarding the project will be published on the website along with the produced dissemination material such as flyers, posters, newsletters, etc. while the TERMINET consortium will measure the number of visitors that the website has.

The site was created by INC and is hosted in the following address: www.terminet-h2020.eu

The project will be available, at least, two years after the end of the project in order to ensure the sustainability of the project results. The home page of the TERMINET website is shown in Figure **4**.

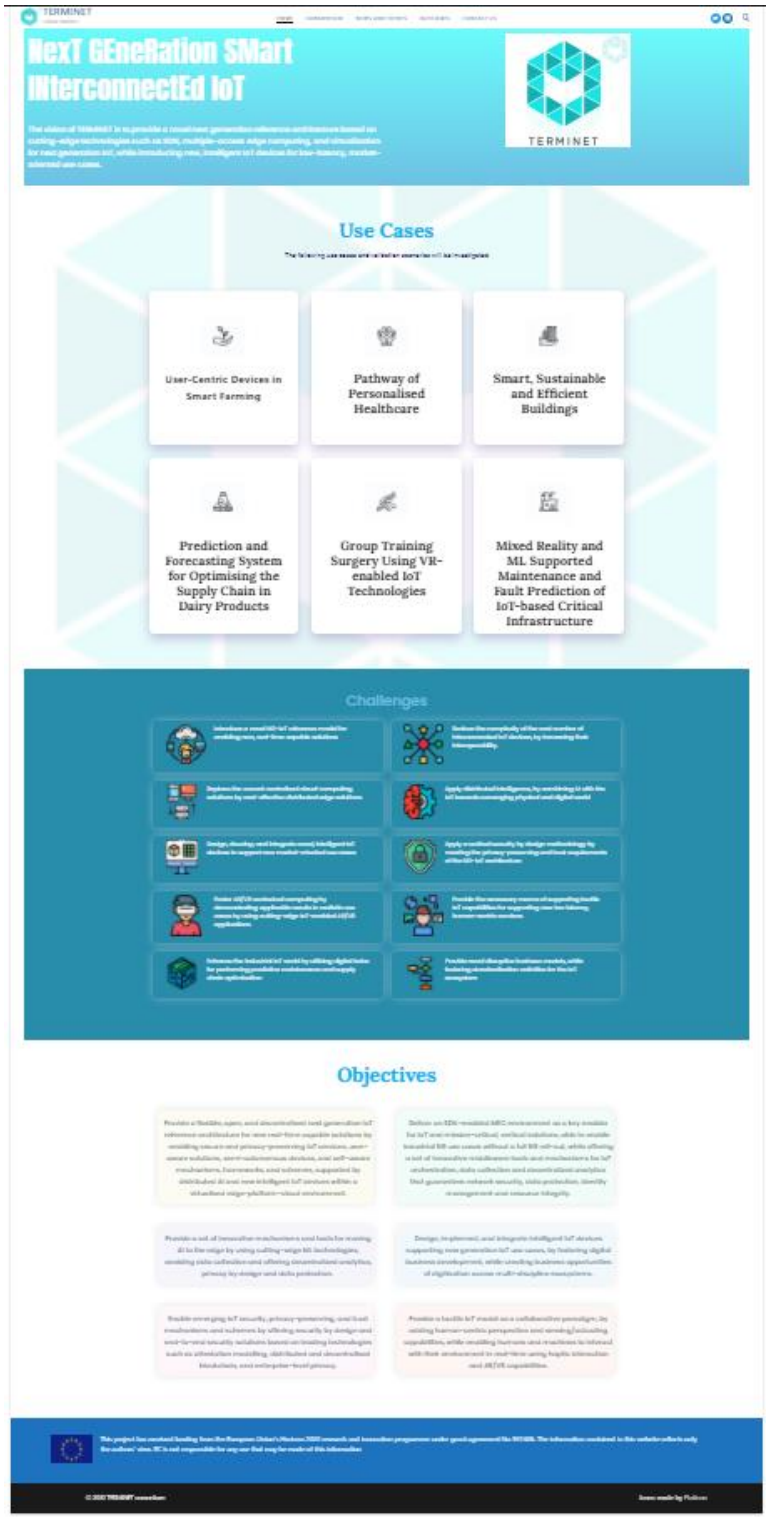

Figure 4: Home Page of the website

3.3 Social media

Social media will be used as communication tools complementary to the website, to enhance the dissemination and communication impact of the project. The social media accounts will be used to inform the audience about the project news, results, achievements and presence at events. All partners will support the project social media accounts through their own social media accounts.

A common identity has been adopted for the social media accounts using the same images, logos and descriptions in order to create a brand name for the project.

3.3.1 Twitter

The twitter account will be used as an alternative communication channel to disseminate more quickly the news and achievements of the project. The account name is @Terminet_H2020 (Figure 5).

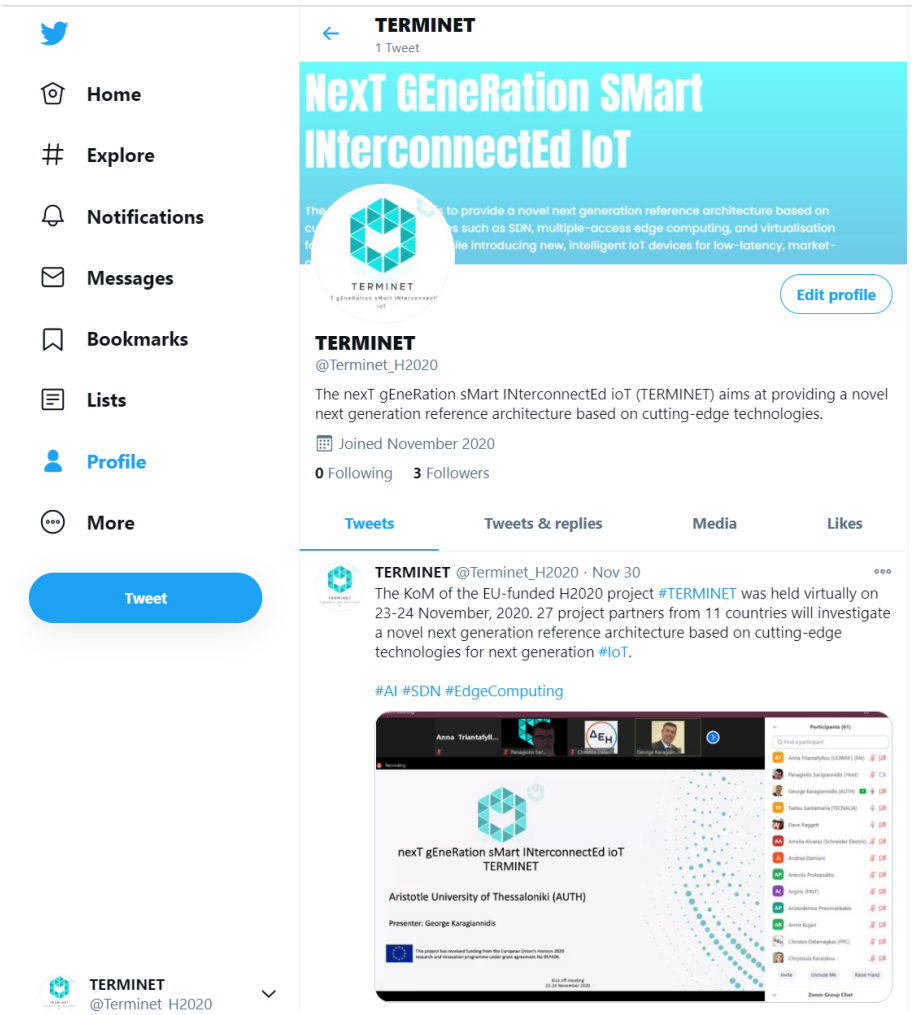

Figure 5: Twitter account

3.3.2 LinkedIn account

A LinkedIn account has been created (Figure 6). It will be used to post all project news. The link to the account is the following:

https://www.linkedin.com/company/69758324

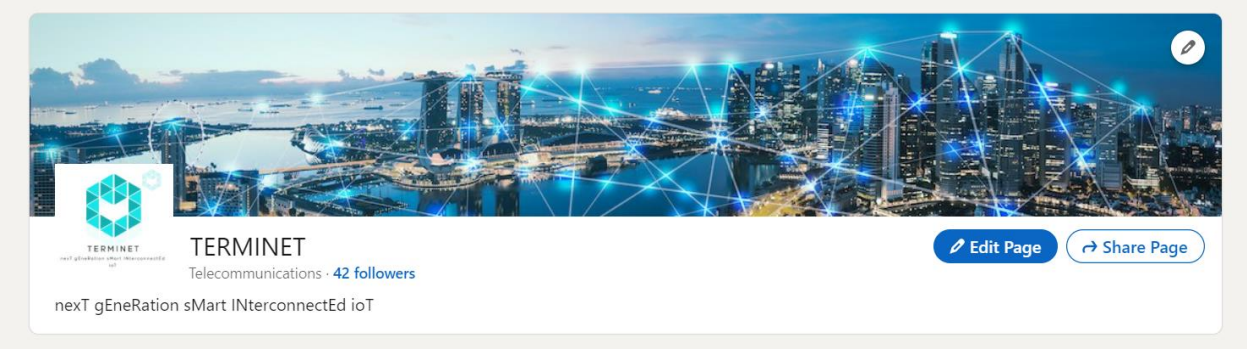

Figure 6: LinkedIn account

3.4 Mailing Lists

Internal mailing lists have been created for coordination purposes. Through these lists, members of the consortium coordinate their actions, communicate important issues and share information. A second list that will be targeted to the external audience (e.g., companies, researchers, etc.) will give them the opportunity to receive the newsletters. A subscription form is available in the project website.

3.5 Newsletters

Newsletters shall be used to raise awareness about project news and updates to external audiences. The plan for newsletter creation is presented in Table **2**. A tentative structure of the newsletter is reported hereinafter. The content will be adapted to "reflect" the evolution of the project during the whole period of the grant. Essentially, the newsletter will include: Short presentations of progresses and achievements in each work package.

Table 2: Newsletters Plan

Task	Lead Partner	Contributors	Date to be delivered
Newsletter Issue 1	INC (create template and edit)	All to provide support material	M9
Newsletter Issue 2	INC (editing)	All to provide support material	M12
Newsletter Issue 3	INC (editing)	All to provide support material	M15
Newsletter Issue 4	INC (editing)	All to provide support material	M18

Task	Lead Partner	Contributors	Date to be delivered
Newsletter Issue 5	INC (editing)	All to provide support material	M21
Newsletter Issue 6	INC (editing)	All to provide support material	M24
Newsletter Issue 7	INC (editing)	All to provide support material	M27
Newsletter Issue 8	INC (editing)	All to provide support material	M30
Newsletter Issue 9	INC (editing)	All to provide support material	M33
Newsletter Issue 10	INC (editing)	All to provide support material	M36

3.6 Blog posts / light content

Blog posts with news from the project and news from the industry will be published in the project website. The detailed schedule of blog posts and associated partner is presented in Table **3**. Each partner will provide two blog posts.

Table 3: Blog Posts Plan

Partner	Month
UOWM	M7, M21
CERTH	M7, M21
KI	M8, M22
PPC	M8, M22
AUTH	M9, M23
SCHN	M9, M23
FINT	M10, M24
TEI	M10, M24
iSPRINT	M11, M25
AFS	M11, M25
INTRASOFT	M12, M26
WTG	M12, M26
SID	M13, M27

Partner	Month
UBITECH	M13, M27
INC	M14, M28
8BL	M14, M28
MEVGAL	M15, M29
UNIBO	M15, M29
LOGOS	M16, M30
TECN	M16, M30
ERCIM	M17, M31
NEC	M17, M31
MARTEL	M18, M32
OPTINVENT	M18, M32
I2CAT	M19, M33
FPG	M19, M33
ALT	M20, M34

In addition, a plan for input coming out from Use Cases and each Work Package has been created. Use Case leaders and Work Package leaders will be responsible for gathering the information and editing it. The initial plan foresees at least four blog posts for each Use Case and two from each Work Package.

3.7 Promotional material

The consortium will prepare press releases and advertising material such as flyers. Printed material will be provided to specific events participants (e.g., conferences). Moreover, posters for the project results will be also used for dissemination. Creation of multimedia material that describes the research objectives, challenges, tangible results, and benefits will be created.

3.8 Summer school, seminars

Towards disseminating the knowledge and technical experience gained from the research activities of the TERMINET project, a summer school with open access will be organized in the lifetime of the project. This course will introduce the participants to the technical expertise and the fields involved in the different components of the infrastructure while presenting the expected results and the forthcoming application of the work done. In particular, open-courses at the BSc, MSc and PhD levels will be available in fields that correspond to TERMINET's technologies, such as, a) Federated Learning, b) Software Defined Networking, c) AR and VR applications, d) NG-IoT Technologies and Security and e) Edge AI. Academic partners will lead this activity while the rest of partners will participate in this event as affiliates. All activities undergone for the realization of the summer school events will comply with the EU safety regulations concerning COVID-19.

3.9 Media appearances

Actions will be targeted to provide interviews on the media (e.g. newspapers, online media and magazines) to widespread the vision and objectives, outcomes and benefits of TERMINET. Upcoming public appearances will be announced from the website and the social media accounts.

3.10 Clustering activities

3.10.1 EC mechanisms and events

The consortium will actively participate in the EC activities organized at program level with the objective of providing input towards common activities and receiving feedback, offering advice and guidance and receiving information related to H2020 program implementation, standards, policy and regulatory activities, national or international initiatives, etc. The usage of following tools that are provided by EU will be examined:

- Common Dissemination Booster
- H2020 Dashboard
- Innovation Radar (IR)
- European Investment Project Portal (EIPP)
- CORDIS/ EU Open Data Portal
- European IPR helpdesk
- REA B.4 marketability assessment survey

3.10.2 Involvement in EU-IoT

TERMINET is one of the NG-IoT Research and Innovation action projects involved in EU-IoT, a H2020 Coordination and Support Action project designed to support the Next Generation IoT initiative (NGIoT). The EU-IoT consortium consists of committed and expert organizations within the European IoT arena, such as IntraSoft, BluSpecs, Fortiss and Aarhus University that, under the lead of Martel Innovate (the EU-IoT Project Coordinator) will assist stakeholders to engage and create value, as well as set up a self-sustaining European IoT community. In particular, EU-IoT provides a collaborative framework, including standardization / open-source mapping, business analysis / modelling tools, as well as online courses and skill development means, to engage EU researchers, developers, integrators, and users.

3.10.3 Liaison with other projects

The consortium will collaborate as much as possible with other ongoing projects to exploit opportunities for knowledge exchange and for improving dissemination and communication among the target audience. The consortium will establish links to related research projects in the field. An initial list of relevant ongoing projects has been compiled:

- FeatureCloud - Privacy preserving federated machine learning and blockchaining for reduced cyber risks in a world of distributed healthcare - Grant agreement ID: 826078 - https://featurecloud.eu/

- MUSKETEER - Machine learning to augment shared knowledge in federated privacy-preserving scenarios - Grant agreement ID: 824988 - https://musketeer.eu/
- ASSIST-IoT is an EU H2020 project ICT-56-2020 research project. It is also under the umbrella of Next Generation IoT and aims to design and develop a unified multi-plane semi-autonomous decentralized edge-cloud reference architecture, supplemented by cross-cutting digital enablers.

4. Dissemination plan

4.1 Journals and magazines for publications

Publishing the results coming out of the project is a well-known and effective dissemination activity. Partners within the project will prepare papers for publication in peer-reviewed scientific conferences, workshops and journals. An initial selection of possible journals and conferences that will be considered for publications and are relevant to the research areas covered by TERMINET has been compiled and is presented in the following tables. This list is not exhaustive, and it will be updated regularly as new calls for papers in relative research areas become available. The participation will be decided according to the relation with the research results of the project.

Table 4: Journals and Magazines

Journal / Magazine title	Website
IEEE Communications Magazine	https://www.comsoc.org/publications/magazines/ieee-communications-magazine
IEEE IoT Journal	https://ieee-iotj.org/
Elsevier Internet of Things	https://www.sciencedirect.com/journal/internet-of-things
IEEE Transactions on Networking	https://ieeexplore.ieee.org/xpl/mostRecentIssue.jsp?punumber=90
Elsevier Computer Networks	https://www.journals.elsevier.com/computer-networks/
Future Generation Computer Systems	https://www.sciencedirect.com/journal/future-generation-computer-systems
Artificial Intelligence Review	https://www.springer.com/journal/10462
International Journal of Medical Informatics	https://www.journals.elsevier.com/international-journal-of-medical-informatics/
IEEE Journal of Biomedical and Health informatics	https://ieeexplore.ieee.org/xpl/RecentIssue.jsp?punumber=6221020
Methods of Information in Medicine	https://www.thieme.com/books-main/clinical-informatics/product/4439-methods-of-information-in-medicine
JMIR Medical Education	https://mededu.jmir.org/
Medical Teacher	https://www.tandfonline.com/toc/imte20/current
IEEE Transactions on Communications	https://www.comsoc.org/publications/journals/ieee-tcom
IEEE Transactions on Wireless Communications	https://www.comsoc.org/publications/journals/ieee-twc
IEEE Transactions on Sustainable Computing	https://www.computer.org/csdl/journal/su

Journal / Magazine title	Website
IEEE Communications Letters	https://www.comsoc.org/publications/journals/ieee-comml
IEEE Wireless Communications Letters	https://www.comsoc.org/publications/journals/ieee-wcl
IEEE Transactions on Industrial Informatics	http://www.ieee-ies.org/pubs/transactions-on-industrial-informatics
IEEE Internet of Things Journal	https://iot.ieee.org/
MDPI Sensors	https://www.mdpi.com/journal/sensors
MDPI Applied Science	https://www.mdpi.com/journal/applsci
Electronics - Special Issue "Applications of IoT and Cloud Computing in Smart Grids"	https://www.mdpi.com/si/electronics/SG_electronics
JAMA Oncology	https://jamanetwork.com/journals/jamaoncology
JAMDA	https://www.jamda.com/
Journal of Cancer Research and Clinical Oncology	https://www.springer.com/journal/432/
Journal of Medical Internet Research	https://www.jmir.org/
Artificial Intelligence in Medicine	https://www.sciencedirect.com/journal/artificial-intelligence-in-medicine
IEEE Journal of Biomedical and Health Informatics	https://www.embs.org/jbhi/
Journal of Biomedical Informatics	https://www.journals.elsevier.com/journal-of-biomedical-informatics
ACM Transactions on Intelligent Systems and Technology	https://dl.acm.org/journal/tist
Lancet Digital Health	https://www.thelancet.com/journals/landig/home

Table 5: Conferences and workshops

Conference / Workshop title	Date	Website
Next-Generation IoT and Edge Computing Strategy Forum	22 April	https://app.swapcard.com/event/next-generation-iot-and-edge-computing-strategy-forum
NGIoT Thematica Workshop Health & Care	18 May	https://www.ngiot.eu/event/ngiot-thematic-workshop-health-and-care/?instance_id=135
IEEE World Forum on IoT	June - July 2022	https://wfiot2021.iot.ieee.org/
IEEE/ACM IoT Design and Implementation	TBD	https://conferences.computer.org/iotdi/
MIE Medical Informatics Europe	2022 TBD	http://www.efmi.org/
MEDINFO	July 7-12, 2023	https://medinfo2023.org/
AMEE	2022 and 2023 TBD	http://www.amee.org/
IEEE ICC	March 14-23, 2021	
Congreso Smartgrids	TBD	https://www.congreso-smartgrids.es/
IoT Week	31 August – 3 Sept	https://iotweek.org
IEEE SPAWC	September, 2021	https://www.spawc2021.com/
The Things Conference - Smart City & Logistics LoRaWAN	September 24, 2021	https://www.thethingsnetwork.org/conference/conference-series/
HealthInf 2022	9-11 February 2022	http://www.healthinf.biostec.org/
IEEE BHI-BSN 2021	27 July 2021	https://www.embs.org/ieee-embs-international-conference-on-biomedical-and-health-informatics-bhi-21/
IEEE International Conference of	9-12 August 2021	https://ichi2021.institute4hi.org/

Conference / Workshop title	Date	Website
Healthcare Informatics		
AWE (there is a conference in Europe, USA and China) every year	Nov 2021, 2022, 2023	www.awexr.com
AR/VR/MR, SPIE Conference, San Francisco, USA	March 2022, 2023	www.spie.org

All publications will include the following text as acknowledgement: "This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 957406."

4.2 Scientific Workshops

Three (3) scientific workshops are planned to be organized by CERTH, TECNALIA & UNIBO respectively.

CERTH will organize a workshop to foster discussion, knowledge sharing and dissemination of new approaches in the fields of distributed computing and federated learning. Topics of interest for the workshop will include but will not be limited to "Federated Learning", "Edge computing for machine learning", "Decentralized deep learning", "Novel applications of FL".

TECNALIA will organize an online workshop related to the Challenges to enhance IoT applications with Federated Machine Learning ruled by Blockchain in line with what it is going to be developed among the project. The session will be carried out in M30, after the deliveries from WP4 and WP5 in order to disseminate the research developed in these work packages and gather feedback. It will be announced in both TERMINET's and Tecnalia's website, and invitations will also be sent to interested contacts.

UNIBO will engage and organize a workshop on the topics of "intelligent IoT devices", "distributed online Digital Twin" and "quality-aware cloud continuum" on prestigious venues such as (i) IEEE International Conference on Communications or (ii) IEEE Global Communications Conference.

4.3 Events and exhibitions

Part of the dissemination activities include the participation in events such as seminars, exhibitions, workshops, etc. These events will cover a broad array of stakeholders such as the research community, professionals, industry players, European Union (EU) bodies, national bodies and universities.

In the initial stage of the plan a list has been compiled with future events at the project's collaboration space, the list will be updated regularly as new events are announced. The participation in the events will be decided on a case-by-case basis that will depend on the availability and maturity of results, the relevance to the research areas and the impact that the event has. This initial list is presented in Table 6.

Table 6: Events and exhibitions

Event title	Date	Place	Website
EUCNC 2022	June 2022	TBA	https://www.eucnc.eu/
Smart City Expo World Congress 2022	November 2022	Barcelona	https://www.smartcityexpo.com/next-edition-2021/
CIRED	2023	TBD	https://www.cired2021.org/
Hannover Messe 2022	TBA	TBA	https://www.hannovermesse.de/en/
Enlit Europe 2022	TBA	TBA	https://www.enlit-europe.com/live
The Things Conference - Agriculture LoRaWAN	29/10/2021	TBA	https://www.thethingsnetwork.org/conference/conference-series/

4.4 Individual dissemination plans

This section presents the dissemination plan of each partner.

4.4.1 UOWM

UOWM's participation in the dissemination activities to promote the work performed in the TERMINET project includes contributions like, publishing high-quality review, survey, technical and experimental-oriented papers, book chapters, and technical reports in high-quality and influential international journals (e.g., IEEE Security and Privacy, IEEE Transactions on Communications, IEEE Transactions on Wireless Communications, IEEE Transactions on Vehicular Technology, etc) and international conferences (e.g., IEEE Globecom, IEEE ICC, IEEE ISCC, IEEE ICOCN, SecureCom, and IEEE Infocom). In addition, UOWM will disseminate TERMINET results through its communication channels like, Social Media, Website, all while participating in local and international media and newspapers, local TV/Radio, etc., advertising the fundamental applications and results of the work carried. Furthermore, UOWM will organize, participate in and promote relevant events, such as, workshops, presentations, summer schools, hackathons and any event deemed relevant in the promotion TERMINET's aims and results.

4.4.2 CERTH

As a major European Research Institute in the Information and Communication Technologies, CERTH will contribute to TERMINET's dissemination strategy with results and data which will be generated during a

multidimensional approach. Throughout this approach, CERTH will mainly focus on research, industry and academia. Furthermore, the exposure and the communication with industry are also covetable. Due to the engagement with the industry, the opportunity to connect the activities of Research Organizations with the ability of the industry to notice and exploit the emerging opportunities for dissemination arises. CERTH focuses its dissemination activities for TERMINET project through: (a) presentations, workshops and demonstrations in considerable conferences in Europe and/or international, (b) its extended network of Research Organizations throughout Europe and its powerful network of innovative and novel businesses in Europe (sizeable businesses and SMEs in the fields of manufacturing and ICT). In addition, due to its non-profitable profile, CERTH focuses only on research and its dissemination, with extensive publication of results in noted and famed scientific journals. The following are the main CERTH's goals: (a) One public demonstration – exhibition, (b) One workshop and (c) Four appearances with specific presentations in conferences (BigDataService, ICMLA, ICML, and AIAI).

4.4.3 KI

KI will pursue the open dissemination of project results in order to maximize the project's impact and to promote the overall interest on its findings. Being a medical university, KI will disseminate the project though the participation in specialized conferences in the field of health informatics, medical education and eHealth such as for example MIE, MEDINFO, and AMEE. In addition to conferences, the production of scientific articles for publication in impact factor journals in the fields of health informatics and medical education is also planned.

4.4.4 PPC

PPC will use its industry contacts and partnerships as well as its public channels to promote the project to the public and stakeholders. PPC maintains a web site which is constantly updated with the latest news from our projects and their outcomes. PPC also has active social media where major announcements are posted. Moreover, PPC will communicate TERMINET's results to practitioners via publications in conferences and international journals and participation in seminars, fairs, and workshops related to big data analytics, IoT architectures, software-defined networking, and artificial intelligence. By PPC's dissemination activities, PPC aims to communicate the project's objectives, motivations, and results to the public. In addition, PPC aims to promote the role and contribution of the European Union towards fostering research initiatives. Planned activities include industrial exhibitions and contribution to scientific publications.

4.4.5 AUTH

AUTH aims at the scientific dissemination of the project's results through the publication of research articles in high-quality international journals (such as IEEE Access, IEEE Transactions on Wireless Communications, IEEE Transactions on Communications, IEEE Transactions on Sustainable Computing, IEEE IoT Journal (IoT-J), IEEE Communications Letters and IEEE Transactions on Antennas and Propagation), book chapters (Springer, IGI Global, IET), international conferences (IEEE Global Communications (Globecom), IEEE International Conference on Communications (ICC), IEEE Infocom, European Conference on Antennas and Propagation (EuCAP), IEEE International Workshop on Signal Processing Advances in Wireless Communications (SAPWC), International Workshop on Antenna Technology (iWAT), International Conference on Modern Circuits and Systems Technologies (MOCAST) on

Electronics and Communications), patents and the website. The most important scientific results will be published in scientific journals, with the open access option. The planned activities include the participation at international conferences, workshops and technology/market exhibition events, as well as the organization of workshops related to NGIoT. Moreover, special sessions will be organized in IEEE sponsored international conferences and special issues with the project topic will be planned in high-quality international journals.

4.4.6 SCHN

Schneider Electric is normally present in annual events and conferences that come together all the actors involved in the Energy community. Some of the events in which Schneider Electric is actively involved are CIRED (https://www.cired2021.org/), Enlit Europe (formerly European Utility Week) (https://www.enlit-europe.com/), Smart Grids Congress (https://www.congreso-smartgrids.es/) and Hannover Messe (https://www.hannovermesse.de/en/).

Relevant results and meaningful progress under the scope of TERMINET UC6 for predictive and maintenance tasks on electrical substations, will be evaluated to be promoted (i.e posters, vouchers, presentations) or disseminated (conference papers) in one or some of the events in which Schneider Electric use to collaborate.

In addition, Schneider Electric will consider the possibilities to collaborate on the publications of papers in relevant publications related to Smart Grids.

Finally, Schneider Electric will promote TERMINET project through its internal and external channels to deploy project results at international level, such as publications on Social media, TERMINET web page on Schneider Electric website, etc.

4.4.7 FINT

FINT is a well-positioned IoT player in Europe. The main target audience in disseminating TERMINET achievements is through company's channels and its current clients in the domain of smart cities, smart infrastructures, and smart agriculture. Moreover, FINT has a great interest to disseminate the project results to increase its potential client's awareness. Additionally, as a highly innovative company, FINT will disseminate project results to create awareness in the scientific community regarding edge computing while also in the other related fields where the company provides its main expertise in TERMINET project.

4.4.8 TEI

TEI dissemination will address several target audiences. From the business perspective, they will be represented by internal stakeholders (Product Lines and Market Units) and external stakeholders (Telecom Operators, ISPs, CSPs companies and universities we cooperate with). From the industrial research perspective, the dissemination actions will involve technical experts from industry and research, academic researchers, ICT open-source communities. In a pure Standardization perspective, the dissemination actions will involve the community working on ETSI NFV ISG for the aspects related to IoT applications applied to 5G transport. In the applied research perspective, Ericsson Customer Units will be involved to convey project outcomes towards our customers.

TEI Dissemination plan is foreseeing its involvement and contribution through multiple channels, mainly aiming at showcasing prototypes and research results at various scientific and industrial events, conferences, workshops. In the following list there are foreseen venues TEI is targeting:

- Demos at Ericsson R&D Italy Innovation Day, an in-house exhibition where customers could take the opportunity to get a focused look at the latest solutions, listen at the Ericsson employees presenting the leading-edge research and developments in next generation networks evolution.
- Presentations to Salerno and Naples Universities about security by design as applied to the new generation networks for edge and IoT concepts.
- Publications of research contributions at academic conferences and journals.
- Internal dissemination within Ericsson corporate communities, where there are also external customers, to discuss, present and provide highlights on TERMINET research results.
- Scientific seminars on the area of security and trustworthiness in 5G and next generation telecommunication services, aiming at increasing collaboration in the international scientific community, like CSA for the security aspects and IEEE Services for IoT experimented application cases.
- Participation in public initiatives and workshops arranged by Ericsson Corporate as well as conferences by Industrial unionists, like IoT Tech expo Europe and InfoSec CyberTech Europe.

4.4.9 iSPRINT

Innovation Sprint will raise awareness for the TERMINET EU project to stakeholders around Good Clinical Practice (GCP) and participate in conferences and events from the pharmaceutical industry.

Innovation Sprint will also promote this European project through a range of content material it will produce through its site (www.innovationsprint.eu), social media channels (Twitter, Linked In, Facebook), and a dedicated project presentation through newsletter communication. The target audience of all these communications is people from the pharma industry, regulators, policymakers, and researchers.

Also, the TERMINET solution can be presented at the annual workshop organized by Innovation Sprint in December (Sprint 5th Workshop), with all the news from the actions and the results of the project.

Finally, Innovation Sprint has already published a Press Release with the general overview of the TERMINET project. The audience for this Press Release is in media containing global pharmaceutical news and resources.

4.4.10 AFS

The primary vehicle for AFS dissemination activities (workshops, focus groups, etc.) will be the vertically integrated agrifood cluster “Internet of Food Alliance” (InoFA) an innovation cluster, an effort to connect all the links of the agri-food chain and those who provide materials and services to it under a common umbrella based on high technology and the Internet of Things and the AFS ecosystem of demonstration farms. Results regarding content will be uploaded in the websites and social media of the cluster (https://inofa.gr/) and in the YouTube SPMO-AFS video channel. Use Case 1 results will be also disseminated through the Horizon project NextFood (https://www.nextfood-project.eu/)

4.4.11 INTRASOFT

INTRASOFT is a leading European company in the area of ICT services provision, for EU institutions and bodies, the public sector and the private sector. INTRA's portfolio boasts the provision of services to a wide range of European and international public organizations along with SMEs and large Private Organizations and Telecoms through its headquarters in Luxembourg, and operational branches, subsidiaries and offices in 17 countries.

INTRA will actively participate in the dissemination activities of TERMINET with its plans to capitalise on its clientele base and wider contacts among EU Organisations and Institutions, Public organisations, SMEs and large Private Organizations throughout Europe and beyond in order to disseminate and promote the TERMINET project objectives.

INTRA's Scope Information and Communication department has been active in the field of Information & Communication services to public and private sector institutions for over 20 years and currently operates from Brussels, Luxembourg and Athens by offering a complete range of digital communication services. INTRA, with more than 40 in-house professionals including editors, journalists, translators, designers and media experts, will utilize its extensive experience and status as a leading provider of communication services in Europe, to deliver high quality content and services in the context of the project. An indicative list of activities to be performed are the following:

- Participation in international (scientific) conferences/trade fairs/forums/workshops:
- Face-to-face communication/meetings
- Preparation, delivery and/or presentation of scientific papers/posters
- Project presentations
- Training courses/seminars/workshops/cooperative learning

4.4.12 WTG

TERMINET will be promoted by WTG in a wide variety of communication channels, both internal and external to the company.

Internally, every TERMINET achievements will be notified to the rest of the company via internal distribution lists and intranet communications. Results will be shared with all departments, which covers the end-to-end product cycle of Smart Cities. By doing this, achievements and results will be considered when improving our own products, or even to use them as a basis for new products in our portfolio.

Regarding the external dissemination, every significant progress, achievement, event or proofs-of-concept born from TERMINET will be promoted via different external digital platforms, such as social media or our website (https://www.wellnesstg.com). Wellness TechGroup will disseminate TERMINET major research results in LinkedIn (https://www.linkedin.com/company/wellness-techgroup), allowing our customer portfolio and followers to know TERMINET news and achievements. Finally, Wellness TechGroup also considers participating into workshops and other events to directly disseminate and promote TERMINET.

4.4.13 SID

SID intends to enhance TERMINET dissemination plans in a) publishing scientific articles in international, peer-reviewed journals and conference, b) preparing public material and c) establishing communication channels in Cyprus and southern Europe. In particular, SID will carry out high-level research, the results of which will be published in popular IEEE, ACM, Elsevier and Springer journal. Similarly, SID aims at publishing cutting-edge results in well-known International conferences such as IEEE ICC and IEEE Globecom.

SID maintains an active social media presence on LinkedIn, Facebook, and Twitter, where significant research accomplishments are revealed. SID also has a corporate website, where the news portal is updated with important information on a weekly basis, and all major project results are published.

SID will also coordinate, engage in, and facilitate related activities such as seminars, presentations, and any other event considered significant in promoting TERMINET's goals and outcomes.

4.4.14 UBITECH

UBITECH will promote and disseminate TERMINET and its components through a variety of internal and external channels as described below.

- Internal dissemination: UBITECH participates in TERMINET with the Network Softwarization and Internet of Things (NSIT) research and development group and collaborates with its security and cloud services groups. The concept and the technical achievements of the project along with any upcoming proof-of-concept demonstrations will be constantly communicated towards UBITECH's business department which undertakes the promotion of solutions towards targeted events as well as collaborating industrial partners and consortia.
- External channels: UBITECH has active communication through LinkedIn where major research achievements are announced. The TERMINET project announcement can be found at this LinkedIn post. Moreover, UBITECH maintains a corporate web site, where the news portal is regularly updated with relevant information, while all major project outcomes are reported. This post at UBITECH's news portal advertises the beginning of TERMINET project.
- Open-source Communities: UBITECH plans to raise open-source community awareness about TERMINET through contributions to popular SDN and NFV initiatives, such as ONF's ONOS and the Click modular router, in which UBITECH had several contributions in the past.
- Academic Conferences/Workshops and Journals: UBITECH aims to raise the research community's awareness through publications to research conferences (e.g., ACM Symposium on SDN Research or ACM Symposium on Cloud Computing), workshops (e.g., USENIX HotCloud), and/or topic-specific journals

The targeted dissemination outcomes include (but not limited to):

a) the project SDN-based architecture,

b) the edge node design and IoT data stream processing functionalities,

c) the connectivity and interfacing solutions for various vertical sectors based on studied use cases,

d) the application aware service orchestration solution

4.4.15 INC

INC will contribute to the dissemination of TERMINET achievements. The main target groups of INC dissemination activities will be its clients including operators, vendors, technology providers, regulatory authorities and government bodies. INC will disseminate TERMINET achievements through workshops, conferences such as the CTTE conference and own publications (INC newsletter).

In addition, INC will actively contribute to the creation of scientific papers and publications in international Journals (e.g. Telecommunications Policy, Telematics, and Informatics) and Magazines (e.g. IEEE Communications Magazine). Finally, INC is willing to announce the main results of the project through its personal website as well as its accounts on social media (Facebook, Twitter, and LinkedIn)

4.4.16 8BL

Internal dissemination: 8BL participation in TERMINET is focused mainly on the Application Layer, specifically in the development of an analytic forecasting toolset as well as the contextual AR/VR framework for targeted use cases. The produced results during the project will be disseminated throughout the company's research departments in order to provide new insights in the areas of Softwarized Networks, Cybersecurity, IoT and Sensors and AI Solutions. Being also involved in the market analysis and business consulting domains, the results from Use Case 4 (Prediction and Forecasting System for Optimising the Supply Chain in Dairy Products) will be communicated in order to strengthen the existing toolsets with the scope of serving targeted applications.

External dissemination: 8BL will disseminate project results through its social network pages (LinkedIn, Facebook, Twitter) as well as on its website where a web page dedicated to TERMINET is already online. Also, it will broker project relevant information to stakeholders in Cyprus and across Europe. 8BL will actively contribute to the creation of scientific papers and publications in international Journals and Magazines, while knowledge will be widely disseminated through the participation in conferences and demonstrations. IEEE and other conferences and events shall be also addressed and included in the individual dissemination plan. Finally, 8BL through its participation in 5GPPP and other H2020 cybersecurity projects will work on building liaisons with other similar initiatives that may use results of the TERMINET project.

4.4.17 MEVGAL

MEVGAL's role to the dissemination process of TERMINET includes the communication of the project to industry contacts and partnerships as well as social media and website promotion of the project to the public and stakeholders.

MEVGAL will post TERMINET in the list of running R&D projects in the specific domain in its site. MEVGAL's site has a visiting volume of more than 5.000 visitors / month.

Moreover, MEVGAL will communicate TERMINET's results to practitioners and interested parties via participation in seminars, fairs, and workshops related to dairy industry and/or IT.

By MEVGAL's dissemination activities, we aim to communicate to the public not only the project's objectives, but also the expected and achieved results.

4.4.18 UNIBO

UNIBO will participate to all dissemination activities deriving from traditional mission of universities, according to the classical Humboldt model, and from the growing interest in the so-called third mission of academia, i.e., to execute technology transfer and innovation initiatives towards industries and society stakeholders in general. In this context, UNIBO will rely on its competence center BI-REX, showcasing the TERMINET core technology and verticals to potential SMEs through a series of seminars and on-site demos.

UNIBO will actively engage in the dissemination of results through various communication channels. For example, AlmaDigitalLibrary (AlmaDL), a sector of the Departmental and Documental Support Division, is the University of Bologna's central service that manages both the institutional repositories for research and educational materials. In particular, AMS Acta, http://amsacta.unibo.it/, is the service that makes viable the dissemination of research results according to the so-called "green road" to open access. AMS Acta is the institutional repository that allows all University of Bologna researchers to self-archive and share their works and data according to the Creative Commons licenses permitting both access and re use. Moreover, AMS Acta is compliant with the requirements of the OpenAIRE and the OpenAIREplus projects and has been regularly harvested by these discovery services.

4.4.19 LOGOS

LOGOS will promote and disseminate TERMINET and its components through a variety of internal and external channels as described below.

- **Internal dissemination**: LOGOS RI participates in TERMINET project on various work-packages, such as WP2 (Requirements, Reference Architecture and Use Cases Definition) setting the requirements for the pilots, in WP7 (TERMINET System Integration) for the integration of the system and in WP8 (TERMINET Validation, Demonstration and Pilot Implementation) for the implementation of the pilots. Throughout these activities, LOGOS RI will be active in disseminating the results and outcomes of the work- packages and project among its internal partners and stakeholders, participating to papers consortium and periodical workshops and conferences. Logos RI is planning to participate in the Virtual booth and short periodical workshops, discussing and disseminating the project results with the community of users and stakeholders.
- **External channels:** Logos RI has active communication through LinkedIn where major research achievements are announced. The TERMINET project announcement can be found at this LinkedIn post. Moreover, LOGOS RI maintains a corporate web site http://www.logos-ri.eu/ regularly updated with relevant information, while all major project outcomes are reported.
- Dissemination's activities and scientific papers deriving from the project advancements, will be diffused throughout the project activities, thanks to LOGOS RI strong links with the Academic and Research world, as well as the corporate and business world including city of Venice and Florence, Thales, Leonardo, University of Cambridge, University of Florence and University of Milano, to name a few.

- **Academic Conferences/Workshops and Journals**: LOGOS RI aims to raise the research community's awareness through publications to top level research conferences, workshops, and/or topic-specific journals, such as FGCS, IEEE Sensors, IEEE Systems, IEEE Transaction on Dependable and Secure Computing. In particular, TERMINET will be widely disseminated at the IEEE International Conference of Cyber Security and Resilience since LOGOS is the main organizer of the event.

4.4.20 TECN

TECNALIA will present the TERMINET solution in co-located thematic conferences, forums and/or workshops. TECNALIA will also develop a specialized workshop to attract the community, share ideas, and present the results from the project. TECNALIA will produce at least one scientific publication (preferably in peer-reviewed journals) to disseminate high-level technology information, attract the interest of the scientific community and stakeholders and pave the way for the efficient exploitation of the results.

In addition to this academia-oriented dissemination, TECNALIA will attend/follow industrial/exploitation meetups to highlight the advantages of adopting TERMINET technology and solutions by the market, promoting the TERMINET solution among its industry contacts and public channels.

TECNALIA maintains a website and high presence in social networks (Linkedin, Twitter, Instagram) where the TERMINET project related news will be posted.

4.4.21 ERCIM

ERCIM plans to describe TERMINET in relevant talks in workshops and conferences, e.g., the annual IoT Week conference. We also plan to disseminate TERMINET within relevant W3C standardization groups, e.g., the Web of Things Interest Group, as well as to use experience gained within TERMINET to help guide standardization discussions relating to e.g., the Web of Things, Digital Transformation and Cognitive AI.

4.4.22 NEC

NEC expects high quality research results from the TERMINET project, relevant to both academia and industry. NEC plans to communicate and disseminate its involvement and contribution through multiple internal/external channels as described below:

- **Social Media:** NEC will promote its participation in TERMINET in social media channels such as LinkedIn.
- **Internal dissemination:** NEC Laboratories Europe closely communicates and collaborates with NEC's business units and its external customers, where research results are presented, exchanged, and discussed.
- **Academic conferences and journals:** NEC Laboratories Europe aims to publish its research contributions also at highly visible academic conferences and journals. Furthermore, NEC plans to showcase project prototypes with NEC involvement at various scientific and industrial events like conferences, workshops, and fairs. The list of academic venues that NEC targets include conferences like ACM CCS and journals like the ACM Transactions on Privacy and Security.

4.4.23 MARTEL

MARTEL already started to use (a) its website (1,5K unique visitors/month, 3K pages views/month), social media (Twitter: 1,1K followers, LinkedIn: 480 followers) and newsletter, (b) the NGI's (MARTEL is running the NGI Outreach Office through NGI4ALL CSA) and NGIoT's and EU-IoT CSAs (MARTEL is leading the outreach activities and manages the communication channels of the Next Generations Internet of Things initiative) ecosystem communication means, targeting to technology-related organizations and initiatives as members and contributors in the Next Generation Internet community, (c) Horizon Cloud community (Martel is leading both CSAs: H-CLOUD and Hub4Cloud) (d) 5G community, as Martel leads the dissemination and communication of the 5G PPP CSA (Full 5G) (d) the Orchestra Cities community that provide access to a great network of citizens but also public authorities and (d) the networks provided and maintained through MARTEL participation in other RID initiatives to widely disseminate the project concepts, achievements and impact creation opportunities for the relevant targeted audiences. It is mentioned that MARTEL maintains at the moment: 35 project websites, 41 social media channels and a database of 2.000 Journalists. Martel is therefore acting as a liaison partner between TERMINET and the Coordination and Support Actions (NGIoT and EU-IoT projects) ensuring TERMINET is well represented at networking events, it's aligned with the community branding and activities, and ensuring visibility across the CSAs communication channels. Moreover, Martel has a broad experience in promoting Open Calls which will be made available to ensure innovators' participation to the TERMINET Open Calls; this includes promotion across established communities such as: NGI, NGIoT, Startup Europe, but also wide platforms such as EdgeRyders, Funding Box and F6S, and finally established relationships with vertical industries clusters and online channels of smart manufacturing being partner o several Horizon 2020 projects (e.g. KITTS4SME for smart manufacturing).

4.4.24 OPTINVENT

OPTINVENT will communicate on the project's results through its website, press releases, and specific industry trade shows. Planned activities include communication and presence in trade shows and exhibitions around optical technologies, augmented reality, wearable technologies such as SID (Society of Information Display, worldwide), Photonics West (US and Europe), AWE (Augmented World Expo in US and Germany), the Wearable Tech Show (UK), and Eurosatory (France). We also foresee the publication of one or more white papers.

4.4.25 I2CAT

i2CAT will focus its dissemination activities on communicating relevant TERMINET results to the IoT research and innovation ecosystem (both academy and industry), raising the awareness of individuals and organizations on the potential of RINA-based IoT solutions in the Tactile Internet space. To do so i2CAT will i) target publications in high impact journals and magazines; ii) prepare scientific papers for international conferences relevant to the IoT and Tactile Internet domains and iii) exhibit project results and network with peer researchers at EC-sponsored events such as EUCNC or ICT. i2CAT will also socialize its work within the RINA community, through participation in RINA workshops. Potential conferences/workshops: EUCNC, ICT events, IEEE World Forum on IoT, IEEE/ACM IOTDI, RINA Workshop.

Potential journals: IEEE Communications Magazine, IEEE IoT Journal, Elsevier Internet of Things, IEEE Transactions on Networking, Elsevier Computer Networks.

4.4.26 FPG

Fondazione Policlinico Gemelli aims to promote the TERMINET EU project through both academy- and general public-oriented dissemination activities.

FPG plans to share TEMRINET progress and results with the general public through its official social network accounts (LinkedIn, Twitter) and website (www.gemelligenerator.it).

FPG will also be committed to sharing TERMINET outcomes with researchers from the medical and hospital management field by publishing high-quality review and experimental papers in the following journals:

- Journal of Cancer Research and Clinical Oncology (https://www.springer.com/journal/432/)
- JAMA Oncology (https://jamanetwork.com/journals/jamaoncology)
- JAMDA (www.jamda.com).

FPG is willing to participate and present the TERMINET project at the following conferences:

- AIRO National Conference (Associazione Italiana Radio-Oncologia)
- ESTRO International Conference (European Society of Radiation Oncology)
- ASCO (America Society of Clinical Oncology)
- SIOG (International Society of Geriatric Oncology)
- SIGG (Società Italiana Geriatria e Gerontologia)
- Gioger National Conference (Gruppo Italiano Oncologia Geriatrica)

4.4.27 ALT

Alteruna will promote its participation in TERMINET in social media channels such as LinkedIn and Facebook and on the website.

5. Exploitation plan

5.1 Exploitation strategy

TERMINET brings together key players of the IoT value chain: from vendors, technology providers to research centres, academia, and high-tech SMEs. The complementary skills of the partners offer a key exploitation opportunity for the innovations that will be achieved at the project. The main aim of the TERMINET project exploitation activities is to explore innovative products and services in order to turn them into commercially viable offers in targeted markets, throughout Europe. The TERMINET integrated exploitation approaches will examine possible scenarios for the further evolution of the developed solution, during or after the end of the project. In combination with a periodic market analysis, it will enable the preparation of both the TERMINET business model and business plan. The project exploitation strategy (Task 10.2) will be undertaken by INC in collaboration with industrial partners and other SMEs. The draft exploitation plan of the TERMINET project results is composed of the individual exploitation plans as well as the joint exploitation of the identified exploitable products. Industrial partners will be the main responsible regarding the exploitation strategy. By incorporating the developed components, partners will enhance their portfolio of products and solutions and will strengthen their position in the market. Academic partners will also benefit from TERMINET results since they will have the opportunity to use the technological achievements of the project. Academic institutes will strengthen their position by participating in future projects and licensing the developed IPR. Also, they can attract more students in the relative areas, providing them with unique, cutting edge, and hands-on experience in a growing field, while offering the possibility to use the developed tools in their courses.

5.2 Joint exploitation

Partners of the consortium are confident that there are a lot of commercialization opportunities related to TERMINET, which should be examined and evaluated. The IoT market is expected to have significant growth in the upcoming years due to technological advances like artificial intelligence, machine learning, semantics, edge computing, etc. As per a report by Fortune Business Insights, the global internet of things (IoT) market was valued at US$ 190.0 Bn in 2018 and is projected to reach US$ 1,102.6 Bn by 2026, exhibiting a CAGR of 24.7% in the forecast period. MarketsAndMarkets forecasts the global Internet of Things market size to be USD 170.6 billion in 2017 and is expected to reach USD 561.0 billion by 2022, at a CAGR of 26.9% during the forecast period. According to MarketWatch, “The global internet of things (IoT) market is estimated to value US$ 847.0 Bn in 2016 and is projected to register a CAGR of over 21% in terms of value during the forecast period 2017-2026”. In the above context, we consider that there is a potential space for the commercialization of the TERMINET solutions. In order for the market potential to be better identified, market research will be performed under WP10 and more specifically on task 10.2. The cooperation between all partners will be based on shared and strong business interests. The consortium is committed to explore and compare the viability, sustainability, and scalability of different exploitation schemes (e.g., direct exploitation by the partners, creation of new ventures) and take clear go and no-go decisions as far as those are concerned, which will be reflected at the end of the project in the business plan. The consortium may also form an entity (e.g., a start-up) to exploit the developed solution.

5.3 Exploitable items

This section provides a list with the initial exploitable items that are expected to come out of the project. The list is organized per partner that will develop these items. As the project progresses and new data are available the list will be updated with more information. The following table summarizes the exploitable assets, the main owner and the expected TRL at the end of the project.

Table 7: List of exploitable items

ID	Name	Short Description	Current TRL	Expected TRL	Main owner	Other owners
EI01	FMLF (Federated Meta Learning Framework)	Federated meta learning personalization models for multiple IoT environments.	Non-Defined	TBD	UOWM	TBD
EI02	GDPR Data protection mechanism	The proposed mechanism will response to personal data regulations and it is going to protect data privacy of end-users.	1	4	SID	-
EI03	RINA-enabled IoT device	RINA implementation for IoT device (custom software / firmware)	1	4	i2CAT	-
EI04	RINA-enabled IoT gateway	IoT gateway capable of communicating with IoT devices using RINA-based protocols	3	5	i2CAT	-
EI05	Vertical Application Orchestrator	Service layer entity which facilitates application placement and management and establishes communication with processing platform(s) and the network controller	6	7	UBITECH	-
EI06	Cloud native SDN enabled platform for IoT connectivity and edge processing	Edge node structure supporting multiple functions and interconnection with SDN enabled IoT gateways through SDN controller	3	7	UBITECH	-
EI07	FPGA enabled edge node	Robust HW solution based on FPGA architecture that can be used for AI algorithms and	4	7	FINT	TBD

ID	Name	Short Description	Current TRL	Expected TRL	Main owner	Other owners
		cyber security services acceleration at the edge				
EI10	Distributed and Decentralised Blockchain Framework	A blockchain framework that supports data validation transparency of AI services, protection of Intellectual Property and an automated process to change static agreements to dynamic code.	3	6	CERTH	-
EI11	Questionnaire Tool	8BL Questionnaire Tool uses a versatile data collection tool based on questionnaires about the ICT market and involving a wide range of stakeholders.	7	8	8BL	-
EI12	Financial Modelling Toolset	Based on some assumptions this toolset is used to evaluate the projected cash flows of investors, based on sales and expenses. It takes into account depreciation, loan financing and load amortization. Regarding investment appraisal, it calculates Payback Period, Accounting Rate of Return, Net Present Value, Internal Rate of Return, and Profitability Index.	6	7	8BL	-
EI13	Analytic Toolset for Forecasting Demand/Sales	This tool will be used to estimate a business's potential demand so as to be able to make accurate decisions about pricing, business growth and market potential as well as the basis for other forecasting operations.	4	6	8BL	-
EI14	SPHINX Blockchain based Threat Registry and Health Information Exchange tool	This mechanism allows to exchange Health information (which includes PII information) with a trustworthy and secure technology and includes a blockchain auditing that allows all the relevant parties to be	3	5	TECN	-

ID	Name	Short Description	Current TRL	Expected TRL	Main owner	Other owners
		mutually assured to have the same exact copy of the advanced threat related data.				
EI15	Healthentia eClinical platform	Improving Healthentia (interconnect the hospital departments, implement the needs of these departments in Healthentia, present the information in ways of increasing value to the healthcare professionals). These improvements are directly commercialized by Innovation Sprint as they are made available. Decentralizing the product using TERMINET edge nodes. This is to be evaluated in the UC2, and could be exploitable together with the relevant partners building the nodes themselves.	9	9	iSPRINT	-
EI16	Smart glasses	Smart glasses for the realisation of AR applications in the context of equipment maintenance and smart farming.	8	9	Optinvent	-
EI17	IoT Platform	WTG's IoT Platform is able to integrate heterogenous data into a visualizable web-based platform	5	7	WTG	-
EI18	IoT Energy Monitoring	IoT Device able to monitor some measurements from an electrical circuit (power, voltage...) and also to act as a gateway for heterogeneous devices.	5	7	WTG	-
EI19	IoT Edge Node	IoT Edge Node able to integrate heterogeneous data from different sensors, and able to perform processing capabilities.	4	6	WTG	-
EI20	FRIE - Next Generation	A contracts for the next generation IOT ecosystems n	4	6	CERTH	-

ID	Name	Short Description	Current TRL	Expected TRL	Main owner	Other owners
	Federated Human-Friendly Blockchain Engine	extended blockchain as a service platform employing human. -readable smart				
EI21	New Generation of RTU devices	New prototype of RTU	3	7	SCHN	-
EI22	IoT communication interface	IoT communication interface embedded in the RTU prototype as new feature	5	7	SCHN	-

5.4 Individual exploitation plans

In this section the individual exploitation plans are presented.

5.4.1 UOWM

UOWM will leverage TERMINET's innovations to upgrade both teaching and research activities. In particular, focus will be given on the outputs provided by the Next Generation IoT (NG-IoT) reference model, AI methodologies in both local and decentralized architectures, security and privacy, as well as their extended applications in the fields of smart farming, medicine, smart energy, supply chain forecasting and supported maintenance and fault prediction in Critical Infrastructures (CI). By incorporating the results of the TERMINET's research on low to high level of application in the field of decentralized knowledge enhancement infrastructures into a consolidated research area applied into undergoing and future exploitations, like cooperating research projects, UOWM aims to improve its capacity and background in the field. Moreover, academic furtherment of the incorporated technologies and methodology will be encapsulated into creating novel academic courses, such as a master's degree course, designed based on the TERMINET's results. The undergraduate curriculum will be updated and advanced in terms of the aforementioned fields while the NG-IoT experience will be included in new courses. UOWM will be able to pursue more R&D projects at the national and EU level. Finally, UOWM aims to project the lessons learnt in the continuation and advancement of corresponding fields.

5.4.2 CERTH

The enrichment of CERTH's portfolio of research activities with the TERMINET project, in parallel with similar projects, is expected to proliferate funding and industrial partnerships by a factor of 10% and 5%, respectively, in the next 5 years. In addition, CERTH will take advantage of the research conducted in the life span of the project to increase the institute's scientific presence by publishing a total of 7 papers in journals and conferences. The research team assigned to the project will be composed of 7 members, including post-doctoral researchers and assistants, in order to adequately cover the different knowledge fields of the project. CERTH's friction to the project will result in both direct and indirect benefits. In the indirect benefits, TERMINET will strengthen CERTH's technological expertise on the project's sectors in a

European scale. Further, CERTH will directly leverage the knowledge generated by the organization by forming copyright policies or patents.

5.4.3 KI

KI as a medical university has an interest in exploring the exploitation material developed within the project for both education and further research. KI participates in the project via the Health Informatics Centre (HIC) that offers academic education in the field of health informatics to different target groups such as students in health profession and/or data- and systems science programs at bachelor and master level, as well as to professionals working in healthcare, and PhD students. Project results are planned to be integrated into our courses, and to develop new research plans and submit new project proposals.

5.4.4 PPC

PPC is the biggest energy provider and operator in Greece, administrating numerous energy-related critical infrastructures inland. The complexity of the different technology power plants and their dispersion in Greece makes operation and maintenance very difficult. Through the TERMINET solution and the relevant use case that PPC participates, the company aims to raise the efficiency of its personnel training processes and improve the efficiency of the maintenance tasks on industrial equipment and critical infrastructure. The integration of NG IoT into PPC's current infrastructure will set the tone of a new era saving both energy and time and increase its robustness. The exploitation plans involve technical contribution to the TERMINET project, performance of the mixed-reality use case, and contribution to the exploitation plan of the project output. Also, PPC will further exploit the developed technologies in new collaborative research projects.

5.4.5 AUTH

AUTH will utilize the innovations in this project in both teaching and research activities. In this context, AUTH will exploit the results to expand its research horizons, pursue further innovations in this area and enhance the learning experience and skills of future graduates by delivering materials at undergraduate and postgraduate levels. This exploitation plan will help AUTH to play an even more important role in the context of research for the Internet-of-Things, edge-computing, machine learning, and the fifth generation (5G) of communications systems. Moreover, the exploitation plan will further strengthen the existing collaborations with industry and also establish new ones. AUTH, through TERMINET will work on the following approaches and activities:

- Exploitation towards industrial partners having consolidated collaboration in terms of research and commitments
- Standardization activities: support and proposal of drafts.
- A master’s in science degree course will be designed based on the TERMINET results. Undergraduate curriculum will be updated and advanced in terms of wireless communication, while the IoT and machine learning experience will be included in new courses.
- AUTH will be able to pursue more R&D projects in national and EU level.

5.4.6 SCHN

SCHN has the intention to exploit the results of the project with an international vision. Due to SCHN's international presence and its leadership in the energy sector, the exploitation of the project result is guaranteed, and the end users will have the privilege to access these technologies in preferable conditions. SCHN's exploitation plan for the project will be part of the global Smart Grid strategy of the company, which follows a direct sale of the product to clients, directly as RTU or as part of a more complete substation automation solution, including RTU and other elements (like SCADA among others).

TERMINET will allow to validate a new generation of RTU devices with an enabled-IoT software interface, which will likely increase the added value of our RTU portfolio.

5.4.7 FINT

FINT plans to enhance its current solutions portfolio in the following ways: 1) Enhance FINoT Platform by introducing a more sophisticated Intelligence layer into the platform making easier the interoperability and federation with third party platforms, 2) Introduce new acceleration services by extending the current acceleration services the company utilises in Cyber Security to other domains like IoT edge networking e.g. a smart cities GW which performs AI tasks at edge and 3) Attract more clients to use company's solutions through the dissemination activities that will be performed.

FINT will follow TERMINET project exploitation activities and will pursue to exploit specific strategies with the project participants: 1) Try to establish license based agreement with other partners when a component developed form another partner is enhancing components or whole FINoT platform, 2) License FINT Edge node development for Acceleration purposes to other partners within the consortium, and 3) Try to participate in joint ventures with the partners that will share the same mentality and will want to exploit in the market the developments of the TERMINET project.

5.4.8 TEI

TEI intends to exploit results in the development and extension of future Ericsson telecom infrastructure products and to further validate and evolve its 5G portfolio and IoT solutions by leveraging the research results from TERMINET, not least the experiences gained in the field-trials in the scope of the project.

The exploitation plan of the TERMINET results will be composed of both individual and joint parts, in which the identified exploitable results are mapped on product and network solution enhancements, starting from the experimented prototypes and then leveraging synergy with the exploitation strategy of TEI Ericsson and their industrial partners. The intent is to incorporate some of the developed components to provide TEI and their partners with an improved portfolio of products and solutions, to strengthen the position in the market.

The project results will be exploited to enhance product and service offerings in the area of network security, where primarily the application area is on solutions for NFV Orchestration and Management of edge networks, specifically new security functions, all addressing the need for trustworthy execution environments in the edge platform and in the connected IoT devices.

Considering that the security by design experiments in TERMINET will provide innovative techniques, suitable to being ported in TEI orchestration and management solution for virtualized network functions and related virtual infrastructures, it is expected that TERMINET results can provide improvements to TEI

solutions, allowing Ericsson to empower their market offer of 5G and next generation telecommunications networks.

5.4.9 iSPRINT

iSprint will be applying their main product, Healthentia, in the healthcare use case of the project. To do so, four departments of FPG will be using Healthentia as their entry point into the TERMINET system. This will facilitate the growth of Healthentia in terms of data capturing capabilities. Sending the data collected into the TERMINET infrastructure will facilitate interoperability of Healthentia with 3rd party systems used in hospitals. Both these tasks are very important in improving the placement of iSprint's main product in the niche market of eClinical research that exploits real-world Data.

5.4.10 AFS

Acting as an innovation facilitator and having already successfully completed projects integrating high technology into daily farmers' routine, AFS aims to present TERMINET technologies across all steps in the supply chain focusing mainly on the producers. The derived technologies can be offered among other agricultural practices as a future service from AFS. Through its continuous living lab approach AFS will help towards the better adoption of new technologies presenting the results in a way that is immediately perceived by farmers, a challenge that will be addressed by TERMINET.

5.4.11 INTRASOFT

INTRASOFT International is involved in the integration of the proposed TERMINET platform. The main goal of INTRASOFT is to reinforce its solutions portfolio through the offering of innovative and specialised applications and services not yet present in the evolving for INTRA market of cybersecurity in various sectors.

Through its participation in TERMINET, INTRA is expecting to:

- Exploit the TERMINET platform and S/W components that can be individually or in collaboration with the other consortium partners, sold to interested customers.
- The management of specialised and general purpose KPIs will allow the TERMINET offering to address broader markets and their requirements, leading to higher commercial value and outreach.
- Investigate the possibility of offering TERMINET as a service in collaboration with the rest of the Consortium partners (i.e. customisation, maintenance, installation, service provisioning, training). More specifically consider new business and operating models (such as Platform as a Service) that become possible with the project for bringing the project results to customers. Explore the role of 3rd parties (not participating in the project), as testers under controlled real-life environments.
- Deliver consultancy services to customers interested in deploying similar infrastructures.
- Cooperate with the leading research institutes and software developers participating in TERMINET that may lead to strategic alliances in the field of commercialisation and technology transfer of innovative aspects of technology. Hence, formation of synergies / collaboration with the partners in the context of another project is also being considered.
- Develop a timeline for exploitation, showing how the exploitation can be structured in phases. Identify the prospective time frame after the end of the project to bring the results to the market.

- Identify concrete customer needs that are addressed with the offered solution and product and describe ways to quantitatively measure the success and involve marketing, product-management, and sales departments early on in the process, for the pre-industrial phase.

5.4.12 WTG

The global market strategy of WTG is based on taking advantage of the experience and its extensive knowledge of the cities sector and of the vertical solutions applied (different managers in more than 400 cities use our technology) and extrapolate it to new sectors where the application of IoT technology is a reality in the short term. Key activities include a) creation of commercial structure in key countries, b) leveraging commercial synergies with countries where WTG already has a presence, c) creation of ambitious communication and marketing plan, d) advancing the development of products adapted to the specific needs of each regions.

In this sense, WTG finds a great opportunity in TERMINET, which is highly aligned with the IoT environment that empowers the Smart Scenarios WTG wants to promote. WTG participation in TERMINET will enrich its own line of products, empowering innovative technologies embedded in TERMINET reference architecture, which considers not only nowadays requirements, but also foresee upcoming ones. From WTG's point of view, our products will be tremendously improved by considering the results obtained from TERMINET in these two key points: (a) to develop a new IoT Edge Node for Smart Buildings, integrating Federated Learning capabilities, SDN-compliant gateways, and able to handle a large and heterogeneous set of IoT sensors and actuators to vastly reduce energy consumption in buildings, and (b) to improve the applications layer of its own products (WeLight, WeSave…) by considering new use cases such as Smart Buildings and energy grids.

5.4.13 SID

SID will exploit the results of TERMINET by extending and expanding its cybersecurity products and solutions with cutting-edge tools for critical infrastructure and healthcare systems. SID will exploit the results of TERMINET by securing fully-functioning platforms for assisting end users in the healthcare, energy and smart farming domain. Also, SID will exploit the results of TERMINET for enlarging its technical know-how. SID will combine its experience in handling penetration tests with the TERMINET research findings in order to provide concrete solutions to organizations and companies that seek protection against serious cyberattacks in any critical domain. Finally, SID will highlight events and private domains in Cyprus and southern Europe in critical infrastructures, healthcare and agriculture organizations. Contacts and interactions with companies in the private sector in Cyprus will be exploited to highlight the benefits of the TERMINET capabilities in handling and addressing cyberattacks.

5.4.14 UBITECH

UBITECH aspires to reinforce its solutions portfolio through: a) the offering of innovative and specialised platforms not yet present in the market and b) the expansion and enrichment of its current consultancy and prototyping solution services. This is done by exploiting the acquired know how of TERMINET's technical results and most importantly the envisioned demonstration actions from the vertical use cases. The goal is to promote primarily:

a) The optimization and adjustment of UBITECH's Vertical Application Orchestration platform solution to the TERMINET architecture and in support of the distributed application aware IoT connectivity platform through advanced edge processing functionalities.
b) The implementation of a cloud native SDN enabled platform for IoT connectivity and edge processing and the demonstration of its capabilities in a variety of vertical sector environments while hosting advanced security and analytics functions.

The goal with the exploitation of the above-mentioned items is to increase its competitiveness, targeting in both the public and private sectors and especially the industry. Though its business development office and well established collaborations, UBITECH identifies opportunities for technology transfer into the vertical industry sector (with priority in energy, industry automation and health sectors) offering customised solutions. In the case of TERMINET the exploitable outcomes are important as they complement the company's expertise in services solutions in the areas of analytics and security, thus opening new market opportunities. In addition, UBITECH will enrich its professional and consultancy services related primarily to digital transformation and IT service solutions. Finally, UBITECH will further exploit the innovative aspects of the developed technologies in new collaborative research projects and initiatives targeting specific vertical sector developments.

It is noted that UBITECH is open to the joint exploitation of the project solutions with other partners of the consortium and the offering of wholistic solutions with higher added value.

5.4.15 INC

As a market research company, INC will take advantage of TERMINET project to enhance its future market reports and seminars with a specific focus on business cases and opportunities via advanced use cases. These market reports will be used by stakeholders involved in the industry to better understand the opportunities in the new era of IoT. INC provides consulting services to a variety of industry players from telecom operators and technology providers to regulatory authorities and governmental bodies. These services are usually based on market reports and INC database PROGNOSIS containing its experience from EU projects. This provides the opportunity to INC to present project results to main industrial partners and key players and be on top of technology developments.

5.4.16 8BL

8BL expects to obtain significant insight from the results of TERMINET, which will reinforce the company's position in the data computing field through the upgrade of existing software solutions and specialized market reports. Specifically, by participating in this project, 8BELLS aims to understand, evolve and exploit its existing reports for the Data Analytics deployment into the real market, by incorporating the outcomes of the project regarding Predictive Analytics. Stakeholders involved in the industry will use these market reports to understand better the opportunities and also manage more easily, more securely and with greater resiliency distributed data centers. Moreover, the incorporation of Sales Forecasting tools will enhance present solutions by providing valuable resource allocation and optimization guidelines. Therefore, the TERMINET project will help strengthen 8BL position as reference international center of excellence for cloud and data science. 8BL will participate and support all the necessary activities for the

commercial exploitation of TERMINET, including the investigation to form a new legal entity (e.g., start-up).

5.4.17 MEVGAL

MEVGAL's participation to TERMINET aims to the optimization of production scheduling through the right forecasting for the demands of each product through the whole distribution network, a process that is necessary due to the large product portfolio which exceeds the 300 product codes. The initial endeavor will deal with a small number of product codes, that will incrementally be increased to entire product portfolio with a special focus on products with small self-life.

The application of NG IoT technologies into the current infrastructure will save both energy and time, creating more efficient distribution and trucks logistics increasing their productivity.

5.4.18 UNIBO

The main target of UNIBO in TERMINET is to consolidate its current know-how and enforce its position in the cloud-to-thing (C2T) computing domain for quality-aware distributed applications, in particular in the Industry 4.0 domain, as well as to position the mobile middleware group at UNIBO at the top 5% level in Italy as far as research and technology transfer is concerned. UNIBO's efforts generating primary results for the exploitation activities include:

- Devise application-aware distributed lifecycle management solutions allowing for resource coordination and adaptation across distributed edge domains.
- Design effective and efficient mechanisms for real-time streaming analytics capabilities at the edge enabling the seamless integration of hybrid and decentralized learning algorithms in the cloud-to-thing continuum (C2TC).
- Definition and implementation of a distributed IoT Digital Twin Environment (IoT-DTE) capable of real-time monitoring and on-site optimization of critical equipment behaviour.

These developments will be 1 year from commercial/scientific use at the end of the project and will initially address the Italian market (short-term), going at the EU level in the medium-, long-term. The sectors of potential application are easily extensible to any quality-sensitive process for Industry 4.0 that take advantage of edge availability, e.g., online reconfiguration of manufacturing lines and optimized manufacturing parameter tuning based on locality considerations.

UNIBO plans to (i) use TERMINET stack in the "Computer Science and Engineering" MSc in, at least, 1 course (Mobile Systems) and for a Summer School on Industry 4.0 organized in collaboration with the BI-REX competence centre; to employ the TERMINET horizontal services in, at least, 2 BSc Mini-Theses (6ECTS) and 4 MSc graduation works (24ECTS), (ii) make the TERMINET platform technologies part of, at least, 1 PhD thesis; to generate, at least, 1 additional project proposal evolving TERMINET for additional and specifically challenging deployment environments, e.g., for collaborative driving of regular cars with IEEE 802.11p connectivity and hosting TERMINET fog-edge nodes and to (iii) organize at least 2 consultancy/training activities to industry beyond the consortium (probably within the consortium of the BI-REX competence centre); at least 1 presentation to Free and Open Source Software (FOSS)

communities, e.g., Docker; at least 2 seminars/presentations of TERMINET models, algorithms, platform, and ecosystem to national or international companies.

5.4.19 LOGOS

LOGOS will exploit its periodical and reserved technology transfer event named "Lateral Thinking Cafè" to disseminate the results in an unconventional face to face meeting with stakeholders.

Moreover, LOGOS as a member/coordinator, will exploit the following networks and groups: IMG-S, AICA, IEEE TC Homeland Security, IEEE Blockchain, Tuscany ICT & AI cluster, ESRA, CERIS Italy chapter to reach a wider audience.

5.4.20 TECN

TECNALIA RESEARCH & INNOVATION (TECN) is a private, independent, non-profit applied research center of international excellence. Legally a Foundation, TECN is the leading private and independent research and technology organisation in Spain and one of the largest in Europe, employing around 1,300 people (219 PhDs) and with income of 102.5 Million € in 2015.

TECN as a research center is interested in the exploitation of the results of TERMINET in two different ways.

On the one hand further exploiting the development of the combination of edge computing, blockchain and federated learning technologies applied in the project for the Next Generation Internet applications in other R&D projects or under contract projects with clients in which this know-how can be an interesting complement.

On the other hand, TECN is also interested in a joint exploitation of the results of TERMINET supporting other interested partners.

5.4.21 ERCIM

ERCIM is the European host of the World Wide Web Consortium (W3C), an international standards development organization focusing on Web technology standards with over 400 member organizations worldwide. ERCIM plans to use the experience gained within the TERMINET project to support standardization efforts in related areas. These include the Web of Things, the Web of Data and Cognitive AI.

The Web of Things is W3C's abstraction layer for digital twins and seeks to decouple developers from the complexities due to the fragmentation of the IoT. This builds upon JSON-LD and RDF to describe digital twins in terms of their affordances (object properties, actions and events), the kinds of things and their relation to each other and to the context in which they are situated, as well as security and communications metadata needed to connect to heterogeneous IoT ecosystems.

W3C has a broad suite of standards for data covering Linked Data and the Semantic Web. ERCIM is leading work on human-like AI in the W3C Cognitive AI Community Group. This holds the potential for radically transforming the IoT in terms of distributed perception, cognition and action, inspired by advances in the

cognitive sciences, and paving the way towards the realization of the Sentient Web. ERCIM will drive a two-way flow of ideas between TERMINET and W3C's activities.

5.4.22 NEC

NEC plans to use the project outcomes to enhance the security of its IT services and devices in social-critical infrastructures like smart cities, smart buildings, eHealth, etc. Furthermore, NEC will use project results to enhance the protection of the users' privacy in such environments. In particular, NEC products will benefit from the work on trusted computing and remote attestation for the building of trustworthy devices and for their secure platform integration.

In general, NEC expects that its products will benefit from the TERMINET project by making them more attractive and competitive in the market. In particular, NEC expects that TERMINET contributes to its platform monitoring technologies for detecting and handling ill-behaving components. NEC's main interest within the TERMINET project is in system monitoring, in particular, the real-time verification of interactions between system components and the processing of sensitive data against system and security policies. NEC Laboratories Europe is in constant discussion with NEC's business units, where, e.g., research results are presented, exchanged, and discussed. To this end, NEC will enhance the lab's prototypes, including the development and implementation of new features, optimizations, and the enhancement of their maturities. Furthermore, these prototypes will be included in uses cases for demonstration.

5.4.23 MARTEL

MARTEL intends to consolidate its experience and position within the European IoT context and broader research and innovation ICT landscape, which will be exploited in several ways. The acquisition of new expertise and knowledge allows MARTEL to strengthen and enrich the spectrum of services offered to its customers and partners, spanning from roadmapping, innovative media and communications, research and innovation management methodologies and tools, training and events. The exposure gained through the planned stakeholders' engagement, community building activities and Open Calls management and implementation allows MARTEL to capitalize on its business reach and extend it. This will enhance our credibility in both the scientific and industrial domains opening new business opportunities, especially in relation to the development of advanced IoT-based reasoning engines for the open source IoT platform Orchestra Cities MARTEL is offering commercially.

5.4.24 OPTINVENT

OPTINVENT aims to sell the optimized version of ORA-2 smart glasses in accordance with the use cases detailed in the TERMINET project in the Industry, agriculture and telemedicine sectors. We will promote the results of the project and our software solution to existing and new customers. Our exploitation strategy will be based on the optimization of Optinvent's smart glasses through a dedicated Android application as proposed in the project which will be an excellent differentiator for Optinvent.

5.4.25 i2CAT

i2CAT will apply expertise acquired through TERMINET activities in optimized protocols for the Tactile Internet to i2CAT's innovation consulting activities, with a special focus on customers working at the Smart

Cities and Industry 4.0 sectors. i2CAT will use the knowledge acquired through TERMINET to allow its Innovation and Business Development department to enhance its portfolio of consulting services to provide market advantages to its customers, especially in the sectors of Smart City and Industry 4.0 Solutions. Along with this, i2CAT will present the project outcomes to its industrial board members in order to influence their products and services. i2CAT will continue looking for public and private funds to further develop and enhance the RINA technology.

5.4.26 FPG

The goal of modern medicine is the personalization of treatments. Personalization means target therapy, i.e., drugs directed on specific receptors (individualization of treatments) and evaluating all the patient's features (tailor-made treatment), a treatment tailored to the patient like a sartorial suit. To achieve this objective, it is necessary that all the data relating to the diseases exacerbated in the patient (multimorbidity), the desired and side effects of the drugs (polypharmacy), the physical and cognitive performance of the patients are constantly assessed and considered as quickly as possible. TERMINET allowing a quicker and faster exchange between the nodes (pathologies, drugs, therapies, treatments...) will help the Health System to get closer to real personalized management of the patient.

FPG is planning to exploit TERMINET outcomes in its master "Big Data and value generation in biomedical research and clinical practice" by sharing the potential of such infrastructure in everyday clinical practice.

5.4.27 ALT

Alteruna will be applying its TeamSimulator platform to the healthcare use case (No 5) of TERMINET. It is a team training application for surgery, where spatial data will be streamed from virtual reality clients (headsets) to a web-based content management application. The data will be converted to a video stream using the edge computing capabilities of the TERMINET. The development of the edge computing capabilities will be an essential outcome of the TERMINET project. Alteruna will also develop and implement solutions for training assessment, examinations and payment. The security layers of the TERMINET will be as important to handle and guarantee user integrity. The Alteruna training concept relies on real-time communication between system components. The TERMINET IoT over 5G will permit such a solution, with high performance, quality of service and user integrity.

6. Standardisation

A major challenge for the IoT is to enable applications involving a wide variety of sensors and actuators in very different contexts, domains and business models. To reap the benefits and enable easy deployment and maintenance, low costs and risks, along with providing trust and confidence, the IoT ecosystems will depend on interoperable platforms and technologies, that in turn are reliant on standards.

Standardisation will be the focus of Task 10.4, with the initial standardisation report (D10.8) due in M18. This section of D10.2 serves as a brief introduction to the landscape of standards, and the role of project dissemination and exploitation in respect to contributing to standardisation activities, building upon work by previous European projects, and related industry alliances.

In the early days, open source was a reaction to perceived profiteering of closed-source software products. Over the years, open source has expanded dramatically, and today few companies would intend their core software systems to be anything but open source. Software solutions are often released as services with a free baseline and the option to pay to upgrade to the enterprise edition for additional benefits. The baseline may be community supported, allowing the vendor to focus on support for their high-value enterprise customers. This approach has enabled open-source software businesses to be far more efficient than traditional software businesses, and to grow much more rapidly.

Thus, open source represents a compelling opportunity for exploitation of project results. The challenge is to achieve sufficient momentum by the end of the project to attract companies capable of sustainable investment in open-source platforms. This involves compelling features, an established user base, and an effective governance model. A choice is needed between minimal effort beyond a (say) GitHub project, launching a new foundation (or similar) or becoming part of an existing entity with a well-established and trusted governance model e.g., the Apache Foundation. The FIWARE IoT platform provides a reference point with their own foundation. Open-source solutions can set the *de facto* standards for an area through unassailable growth. This is where good governance and community representation are key to long term success.

6.1 Standardisation bodies and industry alliances

Which standardisation development organisations (SDOs) and industry alliances are relevant to TERMINET, and how should project partners engage with them? This question will be addressed in greater detail in D10.8. What follows here is preliminary look at previous work in European projects and industry alliances.

Create-IoT was a coordination and support action on behalf of a suite of large scale IoT pilot projects covering a range of different sectors. D06.06 is the final report on IoT standardisation activities. One of challenges called out is to identify where convergence on a small set of standards is necessary, and vice versa, where a large diverse set of standards is beneficial. The following figure is taken from the bIoTope project's landscape of IoT standards:

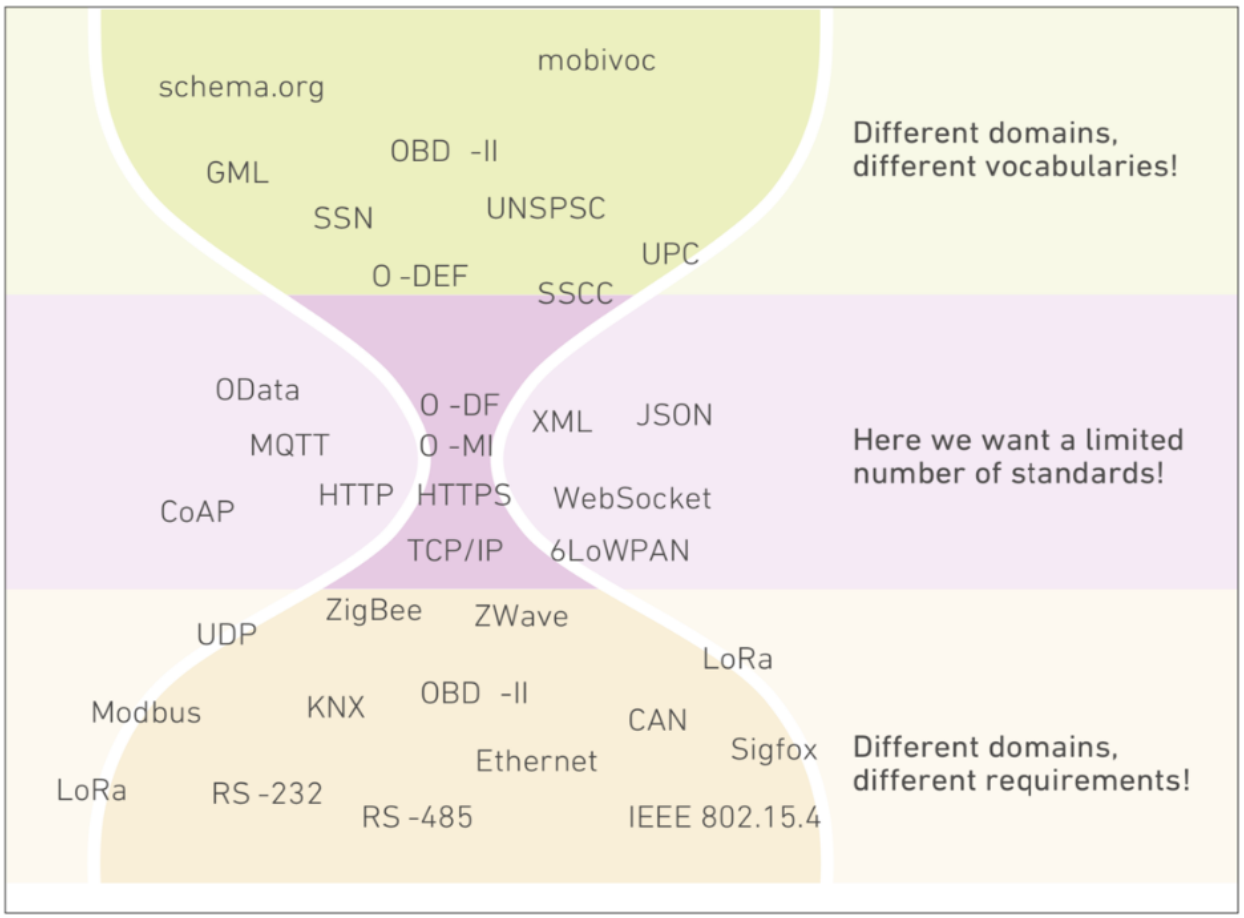

Figure 7: Narrow waist for IoT standards

Create-IoT described the main elements of an IoT interoperability framework as being:

- *Reference architectures*: these establish a shared vocabulary and conceptual models as a basis for common understanding, and a preamble to standardisation.
- *Platforms and technologies*: there are hundreds of IoT platforms available. The challenge is to select and extend or to build afresh according to requirements, maturity, ownership and level of support.
- *Support of design and development*: what is provided to reduce the cost and complexity, especially for applications that span domains. This involves considerations of cross-application interoperability points.

Create-IoT, in conjunction with the Large Scale Pilots, developed a 3D reference architecture for IoT platforms. This is meant to be fed into the discussion initiated by ISO/IEC JTC1 on meta-architectures:

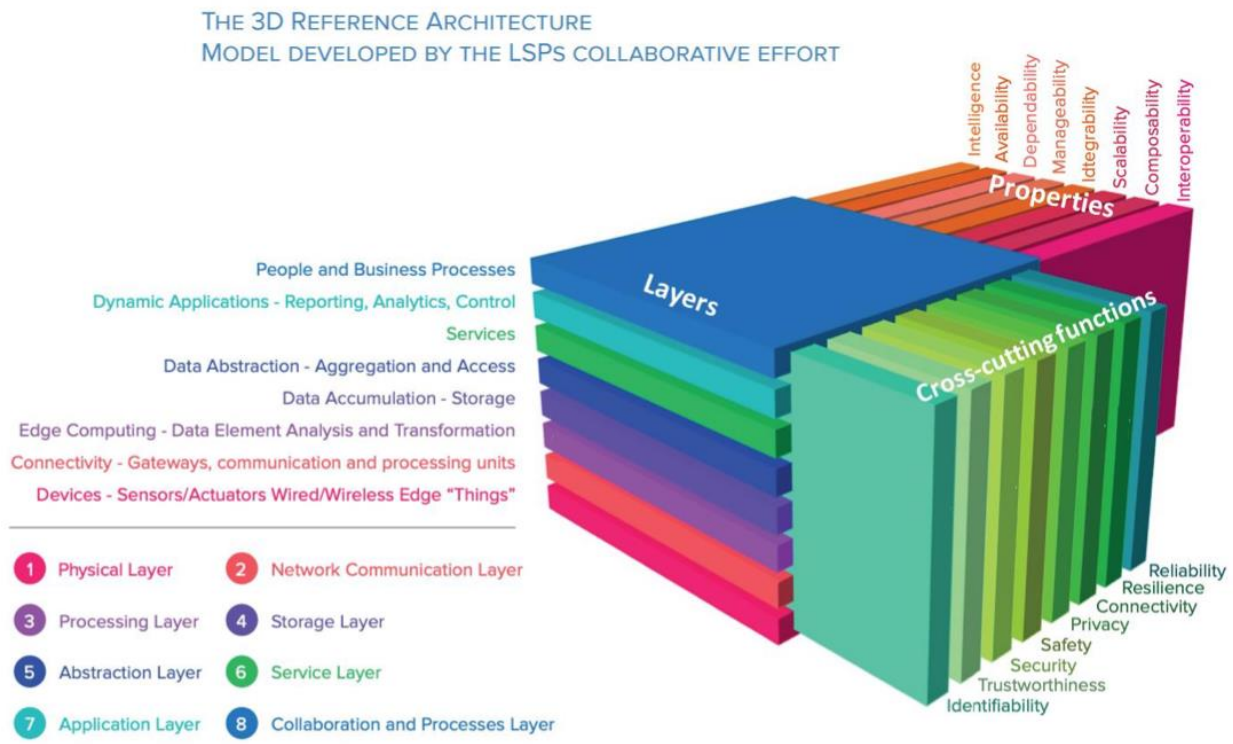

Figure 8: The 3D Reference Architecture

Some topics were identified for future work for the IoT standardisation community:

- Supporting the efficient adoption of new technologies such as Distributed Ledger
- Technologies or Artificial Intelligence, across all parts of the IoT systems from physical to business layers, in support of cross-cutting functions such as security, privacy or safety.
- Developing solutions (including the necessary infrastructure) for secure data management in support Open Access to data and the creation of generic or sector-specific data spaces.
- Addressing the challenges of industrial adoption for semantic interoperability together with improving the efficiency of organisational interoperability solutions.
- Strengthening the provision of privacy and security for resilient services.
- Taking full benefits of communications scalability, reliability, latency (e.g., 5G).
- Boosting the efficiency of edge solutions (data privacy, federation, AI, etc.).
- Reducing fragmentation around auto-configuration and discovery in ways that preserve security and privacy, and abstract away from heterogeneity of underlying systems.
- Proposing robust solutions for privacy-preserving federated machine learning.
- Fostering the emergence of the Intelligent autonomous IoT.
- Defining the Sentient Web (web of digital twins, cognitive AI and open marketplaces).
- Fostering the development of common visions (e.g., through White Papers) across the largest possible number of relevant actors in the field of standardisation.
- Promoting recommendations for collaborations across PPPs, SDOs and other alliances.

The Alliance for Internet of Things Innovation (AIOTI) is a public-private partnership (PPP) set up to contribute to the creation of a dynamic European IoT ecosystem and speed up the take up of IoT. AIOTI members include key European IoT players – large companies, successful SMEs and dynamic start-ups, as well as research centres, universities, associations and end-user representatives.

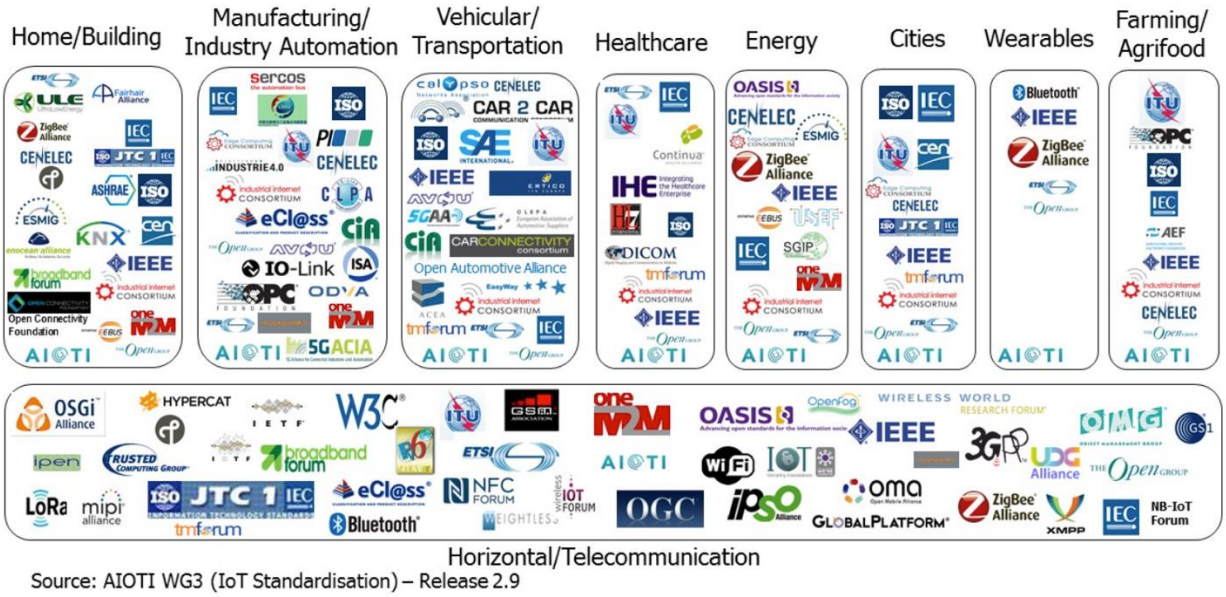

Figure 9: IoT SDOs and Alliances (vertical and horizontal domains)

AIOTI and other relevant PPPs are important channels for TERMINET partners to share information relating to existing standards and on directions for future standards. Here we focus on AIOTI, but a wider survey of PPPs will be provided in D10.8.

Collaboration is now starting between AIOTI WG03 and the European Observatory for ICT standardisation (StandICT/EUOS) on the following topics:

- IoT landscape report and gap analysis
- Edge landscape report and gap analysis
- Data interoperability landscape report and gap analysis

AIOTI is also active in respect to:

- Semantic Interoperability
- IoT high level architecture
- IoT and 5G
- Security and Privacy in relation to IoT

As an example of the relevance of AIOTI to TERMINET, see the AIOTI report on IoT and Edge Computing Convergence:

- https://aioti.eu/wp-content/uploads/2020/10/IoT-and-Edge-Computing-Published.pdf

The above topics are all opportunities for TERMINET to contribute to shape the direction of future standards. Some other PPPs of interest include:

- European Factories of the Future Research Association (EFFRA): https://www.effra.eu/
- 5G Infrastructure Association: https://5g-ppp.eu/
- Big Data Value Association (BDVA): http://www.bdva.eu/
- European Partnership on AI, Data and Robotics: https://ai-data-robotics-partnership.eu/

The "Fireside Chat" event on next generation Internet of Things and edge computing was organised by the European Commission (CNECT-E4) on 31 March 2021. The event report provides a compendium of topics for which TERMINET partners would be in a good position to usefully contribute to standardisation:

> *"Edge computing is the logical evolution of the dominant cloud computing model, avoiding the transfer of mission-critical data to the cloud, supporting resilience, real-time operations, security, privacy and protection while at the same time reducing energy consumption and carbon footprint. In edge computing, the processing moves from a centralised point, closer to (or even onto) the IoT device itself, the 'edge' or periphery of a network."*

For more details, see:

- https://ec.europa.eu/newsroom/dae/document.cfm?doc_id=75377

Finally, here are some specific details provided by TERMINET partners:

ERCIM is involved in AIOTI WG03 as well as leading work on human-like AI in the W3C Cognitive AI Community Group.

ISO SC6 Working group 7 on Future Networks. ISO SC6 WG7 is working on the standardisation of the core RINA specifications and reference model.

The second use case of TERMINET is about healthcare. iSprint is a member of some alliances in the healthcare industry where the application of TERMINET in healthcare can be reported. These are:

- Lifetech.Brussels
- Brussels Life Sciences Incubator
- mHealth Belgium
- BECRO (WG Decentralized Trials and WG Digitalisation)
- EUCROF (WG Real-World Data and WG New Technologies)
- Health 2.0 Belgian branch

Other industry alliances where iSprint is a member and TERMINET results can be disseminated are:

- AI4Belgium
- EMA (SME registry)

INTRA is an active member of two well-known alliances namely, AIOTI and BDVA. INTRA will assist in the standardization processes through our involvement in WG3 (Standardization) and WG11 (Manufacturing). In addition, INTRA is a core member of the newly created BDVA WG in Security and will try to promote related activities, technologies and use cases examined and demonstrated within TERMINET duration.

6.2 Open-source communities

At this stage in the project, we still need to decide which parts of the software developed by the project will be open source, as well as what governance models will be most appropriate.

UBITECH will raise open-source community awareness about TERMINET solutions through contributions to popular SDN and NFV initiatives, such as ONF's ONOS and the Click modular router. The main focus will be on the planned SDN architecture and extensions and according to the TERMINET platform implementation that is led by UBITECH, as well as the edge node functionalities in combination with various vertical sector solutions.

7. Impact

7.1 KPIs

The monitoring of dissemination and communication activities is an essential process to evaluate the success and efficiency of the plan. A set of Key Performance Indicators (KPIs) that monitor the progress and impact of the dissemination and communication activities and act as guidance to take proper actions is defined. These KPIs will be used, to measure the progress of the dissemination and communication activities. Special emphasis will be put on the quality of the attainted results rather than the quantity.

The monitored KPIs include statistics for the website and social media accounts, active participation in events, number of publications and promotional material produced etc. The value generated by the actions will be measured by KPIs such as number of citations, number of "reads" and responses to social media accounts and so on. KPI analysis will steer the TERMINET partners towards the most effective dissemination tools and strategies in order to obtain the highest impact.

In the Table 8, the KPIs associated with each tool and activity is presented. Furthermore, in Annex A: Templates for reporting several tables are presented in which all the activities will be tracked and reported. These tables will be used for the next deliverables of WP10 and also for the periodic reports of the project.

Table 8: KPIs

KPI	Description	KPI description
KPI1	Workshops co-located with major conferences	Number of workshops organised (1-2 per year) Number of participants in each workshop (~50)
KPI2	On-site demonstrations	≥ 2 demonstrations
KPI3	Scientific papers	Number of workshop papers published (1-3 per-year) Number of conference papers published (1-2 per-year) Number of journal papers published (1-2 per-year)
KPI4	Social networks posts	Number of TERMINET posts (≥10) Number of contacts (≥100) Number of likes (≥ 50 likes / share) Number of comments (≥2 com. / share)
KPI5	Participation and/or Attendance to exhibitions	Number of project brochure copies delivered (≥20)
KPI6	Open events with free access, where visitors will realize in a lively way the TERMINET benefits	Number of summer schools (≥1) Number of attendees (≥50) Number of open events (≥1)
KPI7	Online publishing (online magazines, newspapers, blogs)	≥ 5 publications / year ≥ 500 views

KPI	Description	KPI description
KPI8	Inclusion of light content for non-specialized audience in the project website, blog, social media, as well as publishing "lighter" versions of project newsletters, leaflets, flyers, etc	Number of non-specialized material ≥5
KPI9	Participation in media (TV, newspapers, radio) events in order to communicate TERMINET results of the project and explain its benefits to EU citizens, industry, etc	Number of media appearances ≥5
KPI10	TERMINET news will appear in blogs and websites targeting nonspecialized audience, especially the youngest one, focusing on technology news and trends	Number of reads ≥100

7.2 Monitoring

7.2.1 Google analytics

Google Analytics is a freemium service that has been installed in the website and is being used to measure the impact and popularity of the website. Google Analytics analyses web traffic and is capable of indicating how close the project is to achieve the aforementioned goals.

7.2.2 Twitter analytics

Twitter analytics provides a dashboard that allows users to monitor a number of different metrics related to the performance of the tweets.

7.2.3 Dissemination and Impact

The templates presented in Annex A will be used to gather the information for all dissemination and communication activities and estimation of their impact. These templates will be uploaded on the SharePoint space of the project to gather the required information from all partners that participate in these events.

Annex A: Templates for reporting

The following reporting templates have been created in the internal collaboration space of the project and will be used to monitor the scientific publications, the dissemination and communication activities.

Type of scientific publication	Title of scientific publication	Digital Object Identifier (DOI)	ISSN or eSSN	Author(s)	Title of the journal or equivalent	Number/ Date	Publisher	Place of publication	Year of publication	Pages	Public & Private publication	Peer View	Is/Will open access provided to this publication	Type of Open Access	Processing charges for Gold Open Access	Length of the Embargo, if any
{Article in Journal} {Publication in Conference proceedings / workshops} {Books/ Chapter in Books} {Thesis/Dissertation}	{Insert title of Publication}	{Insert DOI reference}	{Insert ISSN/eSSN number}	{Insert Author name(s)}	{Insert Title of the Journal}	{Insert Number of the Journal} {Insert Month and Year of the Publication}	{Insert Name of the Publisher}	{Insert Place of Publication}	{Insert Year of Publication}	{Insert first and last page of the publication}	{YES/NO}	{YES/NO}	{YES/NO}	{Gold / Green}	(€)	(months)

Figure 10: Reporting Template for scientific publications

Type of Dissemination and communication activities	Title of Activity	Short Description	Website/ Social Media (if available)	Type of Audience	Number of Attendees	Date of the Activity	Place of the Activity	Partner Participants (Name, Affiliation)	Presentation if applicable	Is/Will open access provided to this publication	Other Comments
{Organization of a Conference} {Organization of a workshop} {Project Presentations} {Exhibition } {Training} {Participation to a conference/ a workshop/ or other event} { Brokerage/ pitch/ trade fair} { Other}	{Insert title of Activity}	{Insert a subject/ theme/ description of the activity}	{Insert any available online channels}	Insert the type of the audience: {Science Community/ Higher education, Research} {Industry} {Civil Society} {General Public} {Policy Makers} {Media} {Investors} {Others}	{Insert No of attendees apx.}	{Insert Date of the activity}	{Insert Place of activity}	{Insert Partners' Name (s) and affiliation}	{Insert Name Surname , title in case of a presentation}	{YES/NO}	

Figure 11: Reporting Template for dissemination and communication activities

Type of publication	Title of publication	Author(s)/ Creator (s)	Title of the journal or equivalent	Date of publication	Publisher – Partner	"Place" of publication	Public & Private publication	Is/Will open access provided to this publication	Other Relevant Comments
{Press Release} {Non-Scientific and non-peer reviewed publications (popularised publications)} {Flyers } {Social Media } {Website } {Communication Campaign (T.V, Radio)} { Video/Film } { Other}	{Insert title of Publication}	{Insert Author/ Creator name(s)}	{Insert Title of the Journal}	{Insert Date of publication DD/MM/YY}	{Insert Name of the Publisher}	{Insert Place of Publication i.e. website, social media channels etc}	{YES/NO}	{YES/NO}	

Figure 12: Reporting Template for other publications (press releases, videos, campaigns etc.)