
# AMAZING-6G
# Amazing Large-Scale Trials and Pilots for Verticals in 6G

Deliverable 8.2

Interim report on Dissemination, Communication, Standardization, Exploitation

Co-funded by the European Union

6GSNS

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# Executive Summary

This deliverable presents the status of the communication, dissemination, standardization, and exploitation activities carried out within the AMAZING-6G project during the first half of the project lifecycle. The document provides an overview of the actions implemented to maximize the visibility, impact, and long-term sustainability of the project results across academic, industrial, regulatory, and societal domains.

The report summarizes the **communication** and **dissemination** activities performed so far, including the management of the project website and social media channels, the release of newsletters, participation in scientific and industrial events, organization of workshops, and publication of scientific contributions. The document also presents the Key Performance Indicators (KPIs) adopted to monitor the effectiveness of these activities, together with an assessment of the current progress toward the defined targets and the strategy adjustments planned for the second half of the project.

In addition, the deliverable reports on the progress achieved in **standardization** activities, highlighting the project's active participation in relevant Standard Developing Organizations (SDOs), including contributions to 3GPP and GSMA initiatives. The document further describes the activities related to **exploitation** and Intellectual Property Rights (IPR) management, including the analysis of project background assets and the definition of preliminary commercialization scenarios for the project use cases.

Overall, the deliverable demonstrates the continuous efforts of the consortium to ensure broad visibility, effective stakeholder engagement, alignment with standardization activities, and long-term exploitation potential for the technological innovations developed within AMAZING-6G. At the same time, it provides an assessment of the progress achieved against the defined KPIs and target objectives, enabling the refinement and adjustment of the communication, dissemination, standardization, and exploitation plans for the remaining duration of the project.

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# List of Acronyms and Abbreviations

| TERM | DESCRIPTION |
|---|---|
| 3GPP | Third Generation Partnership Project |
| AI | Artificial Intelligence |
| EC | European Commission |
| ETSI | European Telecommunications Standards Institute |
| EU | European Union |
| GA | Grant Agreement |
| IP | Intellectual Property |
| IPR | Intellectual Property Right |
| KER | Key Exploitable Result |
| KPI | Key Performance Indicator |
| OBU | On-Board Unit |
| O-RAN | Open Radio Access Network |
| NGO | Non-Governmental Organization |
| RAN | Radio Access Network |
| RSU | Road Side Unit |
| SDO | Standards Developing Organization |
| TRL | Technology Readiness Level |
| UC | Use Case |
| WP | Work Package |

# 1 Introduction

The AMAZING-6G project aims to advance Beyond 5G (B5G) and 6G technologies through the development and validation of innovative architectures, services, and large-scale trials targeting multiple vertical domains, including eHealth, public safety, energy, and transport. Achieving a strong impact beyond the technical outcomes of the project requires coordinated activities in communication, dissemination, standardization, and exploitation to ensure that project results effectively reach relevant stakeholders and contribute to future technological, industrial, and societal developments.

This deliverable presents the status of the activities performed in these areas during the first half of the project lifecycle. In particular, for what concerns the project activity related to Task 8.1, this deliverable reports the communication and dissemination actions carried out by the consortium, including online communication activities, scientific publications, participation in conferences and workshops, engagement with industrial communities, and interactions with other SNS initiatives. The document also describes the monitoring framework adopted to evaluate the effectiveness of these activities through dedicated Key Performance Indicators (KPIs), together with the resulting adjustments and planned actions intended to maximize the project impact during the remaining project duration.

In addition, for what concerns Task 8.2, the deliverable provides an overview of the progress achieved in standardization activities, including contributions to international standardization bodies and industry initiatives, with the objective of aligning AMAZING-6G developments with emerging B5G/6G standards and ecosystems. Finally, the document reports the activities related to exploitation and Intellectual Property Rights (IPR) management (Task 8.3), including the analysis of project background assets and the development of preliminary commercialization scenarios for the project use cases and Key Exploitable Results (KERs).

## 1.1 Structure of the document

The remainder of this deliverable is organized as follows:

Section 2 presents the communication activities carried out within the AMAZING-6G project, including the management of the project website, social media channels, newsletters, and other communication tools. The section also introduces the communication KPIs adopted to monitor the effectiveness of these activities and presents the updated communication plan for the next phases of the project.

Section 3 describes the dissemination activities performed during the reporting period, including participation in scientific and industrial events, workshops, webinars, and scientific publication activities. The section further outlines the dissemination strategy planned for the remainder of the project.

Section 4 provides an overview of the standardization activities carried out by the consortium, including contributions to relevant standardization bodies and industry initiatives related to B5G and 6G technologies.

Section 5 focuses on exploitation and IPR management activities. In particular, it presents the analysis of background assets, the assessment of exploitation opportunities, and the preliminary commercialization scenarios developed for the project use cases and Key Exploitable Results (KERs).

Section 6 concludes the deliverable by summarizing the main outcomes achieved during the reporting period and outlining the planned activities for the next phases of the project.

# 2 Status of Communication

Communication is a core component of the AMAZING-6G project, acting as the main mechanism for conveying research outcomes to the individuals and organizations most capable of putting them into practice. Effective and timely communication is crucial for transforming research results into tangible social, regulatory, and economic benefits. By increasing the visibility, clarity, and accessibility of project outcomes, communication strengthens stakeholder engagement and supports the uptake of findings in real-world settings.

This section presents the communication status and the adjustments to the strategy developed to maximize the impact of AMAZING-6G's achievements towards its stakeholders.

## 2.1 Results

This section reports the communication activities carried out up to the time of writing, together with the results achieved.

**Project webpage** - The project webpage - https://amazing6g.eu/ - is constantly updated with news and events, results and project developments. The project website acts as the main point of interaction between AMAZING-6G and the wider public. It offers key information about the project's vision, objectives, consortium, and activities, together with a dedicated contact channel. The website also provides access to public deliverables, scientific publications, news, and other project-related updates. To assess its effectiveness as a communication instrument, website traffic and user engagement are monitored through Google Analytics.

**Social media** - Official project accounts are active on LinkedIn (https://www.linkedin.com/company/amazing-6g/), Twitter (https://x.com/Amazing6G), BlueSky (https://bsky.app/profile/amazing6g.bsky.social), and YouTube (https://www.youtube.com/@AMAZING-6G). An account was also created on Mastodon (https://mastodon.social/@amazing6g), but it has been dismissed due to the low reach. The active social media accounts are regularly updated to communicate project results to a broader audience. These channels are used to share news, participation in events, demonstration videos, and other relevant project content. As with the project website, engagement indicators are monitored to assess the effectiveness of social media dissemination activities.

**Newsletter** - Twice a year, newsletters are planned to showcase the project's main achievements, promote events and initiatives, and provide updates to the general public. Newsletters are disseminated through the project's social media channels, partner networks, and institutional platforms, and are also made available on Zenodo. A standardized template is used to ensure consistency across editions and will be reused for future newsletters.

At the moment, three newsletters have been released, and a fourth one is in progress. The released ones are:

- Six Months Digest #1 - July 2025
- Six Months Digest #2 - January 2026
- Six Months Digest #3 - March 2026

**Other communication activities:**

- Presentation of the project activities in SJS-JU Working Groups (WGs), including a presentation of the project at the sustainability WG (19/09/25 - WINGS) and of its architecture at the architecture WG (21/11/25 - UoS),
- Presentation at Techritory 25 about "Empowering advanced applications in the 6G era" (22/10/25 - WINGS),

- Booth at the Kelekkamessut Rovaniemi event, in Rovaniemi, Finland (2/11/25 - APT, FMI, and VTT),
- Presentation at the Fieldlab Zephyros AIRTuB Annual Event, in Vlissingen, The Netherlands (28/11/25 - TNO),
- Participation to the SNS Journal 2026 (16/1/26),
- Realization of two project videos: a project presentation (WINGS and UC3M), and a video about the building energy management activity (Nextworks).


**Figure 1. AMAZING-6G at the Zephyros Fieldlab Annual Event in Vlissingen, The Netherlands.**

## 2.2 KPI monitoring

To assess the effectiveness and impact of the communication activities carried out within the AMAZING-6G project, a set of Key Performance Indicators (KPIs) has been defined and is continuously monitored throughout the project duration. These indicators provide quantitative evidence of the reach, visibility, and engagement generated by the project's dissemination and communication efforts, while also supporting the identification of areas for improvement.

The monitored KPIs cover a broad range of communication channels and activities, including the organization and participation to targeted events, demonstrations and exhibitions, website traffic, social media engagement, and the distribution of communication materials. In addition to activity-specific indicators, audience participation and engagement levels are evaluated through metrics such as the average audience reached during events and webinars. These indicators make it possible to evaluate not only the quantity of communication outputs produced, but also their effectiveness in reaching relevant stakeholders and the wider public.

The collected KPI data are periodically reviewed to measure progress against the communication objectives defined for the project and to adapt communication strategies when necessary. This monitoring process ensures that communication activities remain aligned with the project's goal of maximizing visibility, stakeholder engagement, and societal and industrial impact.

**Table 1. Communication KPIs: target value, current value and projection through the project duration.**

| Communication KPI | Target value | Current value | Projection |
|---|---|---|---|
| Organization of targeted industrial workshops (Physical) | 5 | 2 | 5 |
| Organization of targeted industrial workshops (Webinar) | 5 | 0 | 0 |
| Participation in major industrial events | 3 | 2 | 5 |
| Demos and industrial exhibitions | 15 | 1 | 2 |
| Website visits | 3000 | 8400 | 18900 |
| Social Media Followers | 1500 | 327 | 736 |
| Social Media Impressions | 1500 | 23587 | 53071 |
| Video views | 3000 | 6 | 14 |

| | | | |
|---|---|---|---|
| Videos | 3 | 1 | 2 |
| Leaflets | 1500 | 54 | 122 |
| Online/media talks | 3 | 2 | 5 |
| Blog posts | 45 | 13 | 29 |
| News | 30 | 29 | 65 |
| Newsletter recipients | 1500 | 366 | 824 |

Table 1 reports the different defined KPIs for the project communication activities. For each one of them, the target value is reported, together with the current measured value and its linear projection through the project duration. As we can see, for some KPIs the target value has already been reached (e.g., Website visits), for others the projection reached the target (e.g., Organization of targeted industrial workshops - Physical), while for others the activity has not started yet, or is far from reaching the target even with a projection through the project duration (e.g., Organization of targeted industrial workshops - Webinar). We must consider that the second half of the project, yet to start, is the one richer in results to be communicated, but a plan has been defined to adjust to the target, which is detailed in the following subsection.

In further details, for what concerns the activity of the project's **website**, in order to assess the effectiveness of the website as a communication channel, visitor statistics are monitored through Google Analytics. Figure 2 shows the evolution of active users over time, indicating a total of 3700 unique users for a total of 8400 views.

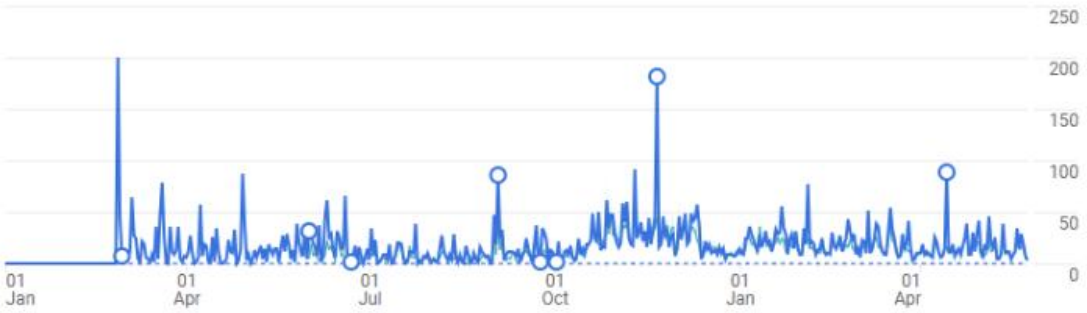


**Figure 2. Active users over time, for the project webpage.**

On the other hand, Figure 3 reports the origin of active users by country (left side), showing how they come from every zone of the globe, being Asia the main source. The same figure reports the origin of active user by primary channel (right side), showing how direct access is the main source, followed by organic search. These indicators help identify where additional efforts may be needed to improve the project's visibility, for example by analyzing the geographical origin of users, and to assess whether specific communication activities lead to the expected increase in website traffic.


**Figure 3. User origin by country (Left) and by primary channel (Right).**

As with the project website, engagement metrics are collected to evaluate the performance of **social media** outreach. As introduced above, the poor performance of Mastodon brought us to dismiss this

social media to focus more on the others. Table 2 reports the number of followers and impressions for the different social media. As we can see, YouTube started gathering followers as it includes now videos. It is also notable how the number of impressions per follower is much variable among the different social media, ranging from about 100 on LinkedIn, to less than one on BlueSky and YouTube.

**Table 2. Followers and Impressions on the different social media.**

| Social media | Followers | Impressions |
|---|---|---|
| LinkedIn | 246 | 23,002 |
| X | 28 | 568 |
| BlueSky | 42 | 14 |
| YouTube | 11 | 3 |
| **Total** | **327** | **23,587** |

Figure 4 reports the demographic for the LinkedIn followers, by industry sector. As expected, the majority represents education and research, telecommunication and IT.

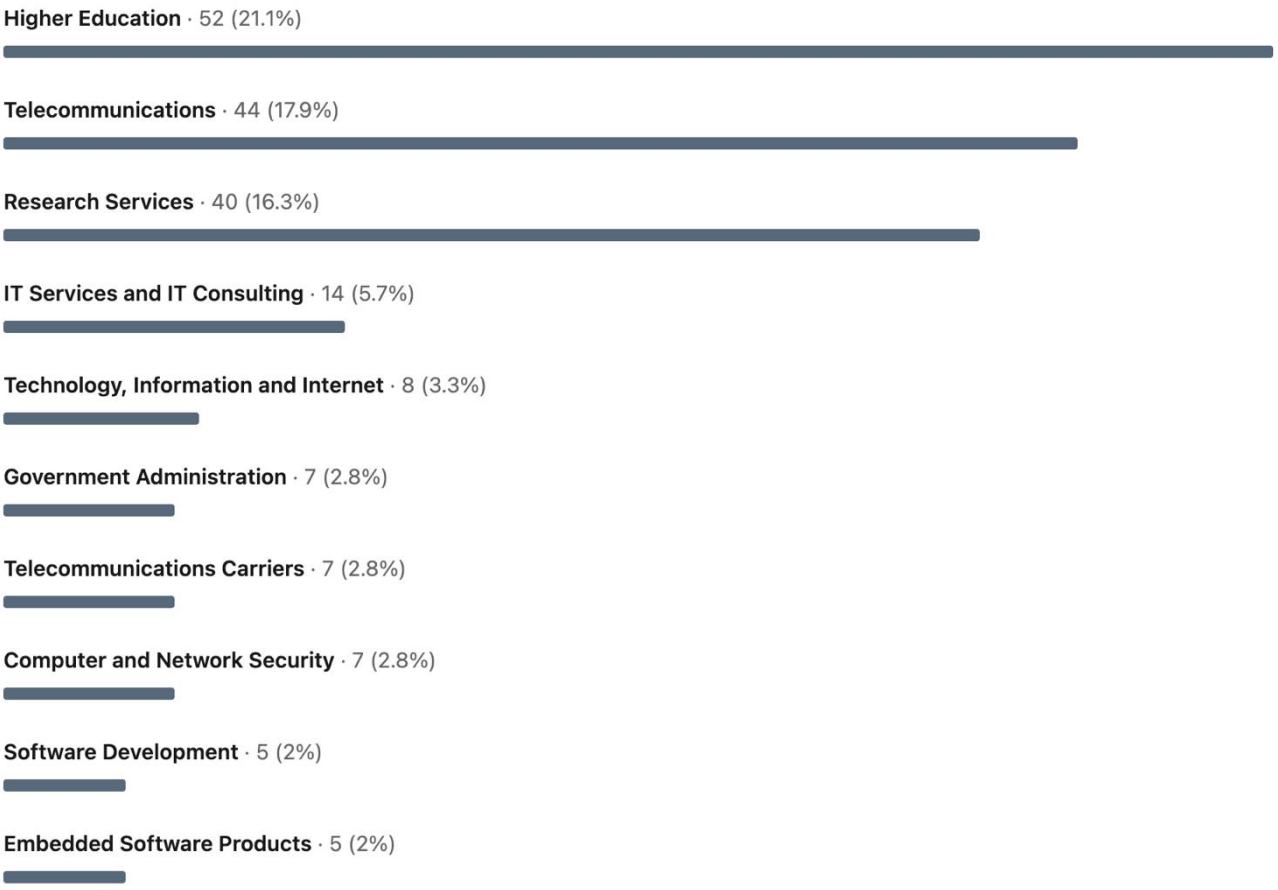


**Figure 4. Followers' demographic by industry for LinkedIn.**

## 2.3 Strategy adjustment

Considering the KPIs collected about the communication activities, and their defined targets, a plan has been defined for the AMAZING-6G project to ensure continuous visibility of the project activities and results throughout the entire project lifecycle, specifically focusing on the set of KPIs not yet reaching their target in the project projection.

In particular, for what concerns the organization of physical targeted industrial workshops, the plan includes a final event, hosted by VTT on M36, as well as local workshops, to include local stakeholders

and build networking opportunities, to be held in the different clusters (Italy, Greece, Romania, Finland, Belgium, Germany, and Poland), between M30 and M35. For what concerns the virtual workshops instead, the plan includes a webinar presenting the project (eventually joint with other SNS-JU projects of the same call), as well as webinars presenting the different verticals to the reference stakeholders, and to present the different UCs.

For what concerns the participation in major industrial events, the plan includes the Mobile World Congress, as well as specific vertical events, like the Logistics & Transport Thessaloniki Expo etc.

The communication plan also includes the production of multimedia and promotional materials, such as videos presenting use cases, trial execution activities, project overviews, and webinar recordings. These materials are intended to improve accessibility and facilitate communication with audiences beyond the research community.

A structured newsletter campaign has been defined to provide regular updates on the project progress. The campaign includes the following topics: Architecture (#4, currently in progress), UC Development (#5, in September 26), Final trials (#6, in March 27), Trial execution (#7, in August 27), and Lesson Learnt and Key Achievements (#8, in December 27).

Overall, the communication plan provides a structured framework for coordinating communication and outreach activities across the consortium, ensuring consistent messaging, continuous stakeholder engagement, and broad visibility of the project results during all project phases.

# 3 Status of Dissemination

Dissemination of results is a fundamental step in transforming research into actionable knowledge and practical impact. In the context of AMAZING-6G, dissemination is considered a core component of the project rather than a complementary activity, ensuring that the project's innovations and findings reach researchers, industry stakeholders, policymakers, and broader communities that can benefit from them. By enhancing the visibility of project outcomes and fostering engagement among public and institutional audiences, dissemination contributes to maximizing the relevance, adoption, and long-term impact of the project results.

The remainder of this section describes the main dissemination activities implemented to increase awareness, accessibility, and practical uptake of the research outcomes generated within AMAZING-6G, as well as their measurement, and the refinement of the dissemination plan for the rest of the project.

## 3.1 Results

The following dissemination activities have been carried out, since the release of Deliverable 8.1.

Scientific publications:

- "Impact of Weather on Satellite Communication: Evaluating Starlink Resilience", published at IEEE Vehicular Technology Conference VTC2025-Spring by VTT, this paper describes satellite baseline performance measurements with the effect of weather, and relates to T3.1.
- "Introducing a Framework for a Vendor-Agnostic 5G Network Data Space", published at the 2025 14th IFIP/IEEE International Conference on Performance Evaluation and Modeling in Wired and Wireless Networks (PEMWN) by UPAT and PNET. This paper proposes a vendor-agnostic 5G data space architecture for interoperable collection, standardization, and sharing of network metrics across commercial and open-source infrastructures.
- "Optimal Scaling and Offloading for Sustainable Provision of Reliable V2N Services in Dynamic and Static Scenarios", published on IEEE Transactions on Network and Service Management (S.I. on Reliable Networks) by UC3M, this paper is about resource optimization under latency constraints in V2N communication, and relates to T3.1.
- "Practical Insights from Benchmarking Open-Source 5G Standalone MIMO in Indoor Environment", published at IEEE Consumer Communications & Networking Conference 2026 by IMEC, this paper evaluates indoor 5G SA performance with different MIMO configurations.
- "Dynamic End-to-End Network Slicing for Safe and Reliable Teleoperation Use Cases", presented as a poster at IEEE Consumer Communications & Networking Conference 2026 by IMEC.
- "Robust Wireless Resource Allocation Against Adversarial Jamming", published at IEEE International Conference on Communications (ICC 26) by TUC.
- "V2X Messaging with CoAP and EdgeX for probabilistic risk-aware mixed urban traffic", published at ACM Special Interest Group on Data Communication (SIGCOMM 26) by CAPG, this paper presents a standards-based architecture for V2X communication using CoAP and EdgeX Foundry and is related to T3.4.
- "Study and analysis of runtime energy consumption in cellular 5G network: An empirical approach", published by Springer Nature Journal on Wireless Communications and Networking. This paper by VTT relates to T3.3 and is about E2E energy consumption measurements and analysis for HTTP streaming in mobile networks.
- "The Impact of Next-Generation B5G/6G Networks on Immersive VR and Mobile Live Sports Viewing Experiences" published in the Elsevier Journal of Innovation & Knowledge by UC3M. This paper is about 6G as enabler for immersive experiences, and its effects on KVIs, and relates to WP3.
- "Measurement-Driven Probabilistic Prediction of Tail Latency in 5G Networks" will be published at the 2026 EuCNC & 6G Summit by TUC. The paper relates to WP2 and WP3.

- "A GenAI-Driven Multi-Agent Framework for Explainable Intent-Based Slice Recommendation" will be published at IEEE NETSOFT 2026 (ADeCoS) by CAPG and relates to T3.1.
- "5G for Railways Over Leaky Coaxial Cables: Experimental Validation on an FRMCS Testbed" will be published at IEEE Vehicular Technology Conference VTC2026-Spring by TUC and is related to WP3.
- "Queue-Aware Deep Reinforcement Learning for Joint Beam and Power Control in mmWave FRMCS" will be published at IEEE Vehicular Technology Conference VTC2026-Spring by TUC and is related to WP3.
- "Experimental Evaluation of Multipath TQUIC for Mission-Critical Communications" will be published at IEEE Vehicular Technology Conference VTC2026-Spring by TUC and is related to WP3.
- "Confidence-Calibrated Positioning for Uncertainty-Aware V2X Systems" will be published at IEEE Conference on Communications and Networking 2026 (MeditCom 2026) by CAPG and is related to T3.4.
- "Towards End-to-End Network Slicing: Slice-Aware 5G Backhaul with Isolation and QoS Guarantees" will be published at IEEE EuCNC 26 by IMEC and relates to T3.1.
- "Enabling Vertical Services with a Cross-Domain 6G Architecture and Trial Framework: The AMAZING-6G Approach" will be presented as a poster at EuCNC 26 by IMEC, UoS, TNO, UPAT, NXW, LINKS, WINGS, and OUS. It relates to WP2.


**Figure 5. AMAZING-6G participation at the 14th IFIP/IEEE International Conference on Performance Evaluation and Modeling in Wired and Wireless Networks (PEMWN 2025).**

White papers:

- The project participated in the "SNS eHealth White Paper", with contributions by OUS and TNO about WP4.
- The project is participating in the "SNS PPDR White Paper", with contributions by UPAT, PNET, and VTT about WP4.
- The project is participating in the "SNS TMV KPIs v.2 White Paper", with contributions by IMEC, WINGS, and the different UC partners, about WP7.

Organized conferences and workshops:

- "Ports as Strategic Gateways for New Freight Corridors", in the Logistics & Transport Thessaloniki Expo, organized by CERTH.
- "AMAZING-6G: APIs and frameworks for verticals", special session at in EUCNC 2025, organized by WINGS.

- "SpringSchool 2025", organized at the University Alexandru Ioan Cuza of Iasi by ORO.
- "ORO 5G B2B Workshop", internal event organized by ORO.
- "SpeD Conference" organized at the University Politehnica of Bucharest by ORO.
- "ORO - Vietnam Telecom Operator 5G Sharing", internal event organized by ORO.
- Industrial Presentation at Globecom 2025, co-chaired by TNO.
- "2nd Winter School on AI for 6G Communications", at Las Palmas de Gran Canaria, Las Palmas, Spain, organized by UC3M.
- "Architecture Workshop", project event organized by UoS.
- "2nd Workshop on ISAC" at EuCNC 2026, Malaga, Spain, organized by TNO.
- "EuCNC 2026 Workshop on General Sustainability" at EuCNC 2026, Malaga, Spain, co-organized.
- "Large-Scale Trials and Pilots: The Pathway from SNS JU Call 1 to R&I Workprograme 2027" at EuCNC 2026, Malaga, Spain, co-organized.

AMAZING-6G's participation to EuCNC was awarded with the Best Booth Poster Award in its 2025 edition.

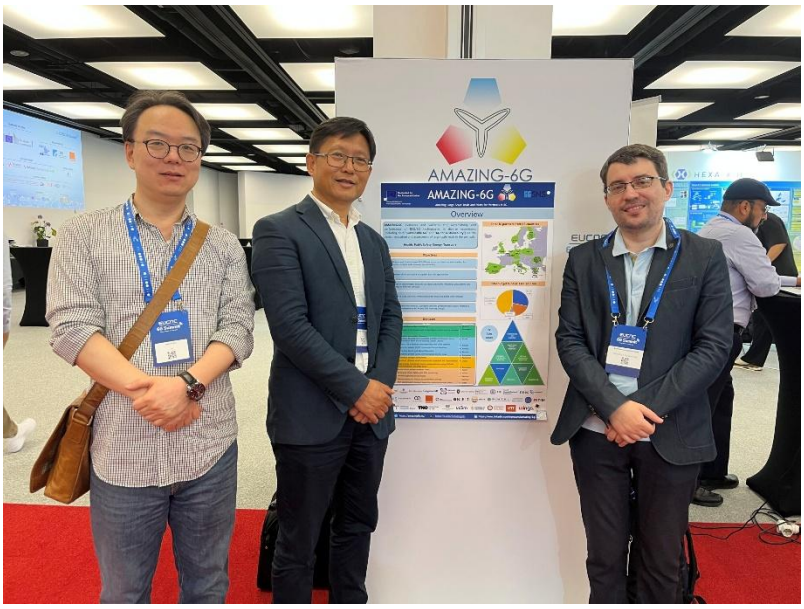


**Figure 6: AMAZING-6G in EUCNC 2025 won Best Poster Booth Award**

Also, AMAZING-6G was awarded in the 6G SNS Use Case Contest in its 2026 edition, with its Smart Energy use cases being recognized.


**Figure 7: AMAZING-6G in EUCNC 2026**

## 3.2 KPI monitoring

To evaluate the effectiveness and impact of the dissemination activities conducted within the AMAZING-6G project, a set of Key Performance Indicators (KPIs) has been established and is regularly monitored throughout the project lifecycle. These indicators provide quantitative insights into the visibility and reach achieved through the project's dissemination actions, while also helping identify opportunities for improvement. For each of these defined KPIs, Table 3 reports the target value at the end of the project, the current measured value, and its linear projection through the project duration. Even if this is a much conservative estimation, given that the second half of the project is usually much richer in terms of results and achievements to be disseminated, this projection brings to a reach of all the defined KPIs. Nevertheless, as detailed in the following section, a specific plan has been designed to identify specific opportunities for the different dissemination activities to be carried out, in order to maximize their impact and outreach to the target stakeholders.

**Table 3. Dissemination KPIs: target value, current value and projection through the project duration.**

| Dissemination KPI | Target value | Current value | Projection |
|---|---|---|---|
| Participation in joint workshops with other SNS initiatives | 4 | 2 | 5 |
| Organization of scientific workshops/events | 2 | 6 | 14 |
| Participation in scientific events | 6 | 9 | 20 |
| Scientific publications | 30 | 17 | 38 |

## 3.3 Strategy adjustment

Based on the KPIs collected from the dissemination activities and the corresponding target values, a dissemination plan has been established for the AMAZING-6G project to ensure continuous visibility of project activities and results throughout the project lifecycle.

In particular, for what concerns the participation in joint workshops with other SNS initiatives, identified venues include EuCNC 27, IEEE GlobeCOM 26 and 27, and standardization workshops. For what concerns the organization of scientific workshops and events, identified targets include EuCNC 27, IEEE GlobeCOM 26 and 27, IEEE WCNC 27, a 3rd Winter School on AI for 6G Communications. For what concerns the participation in scientific events, identified targets include WuCNC 27, WoWMoM 26 and 27, the Nordic Conference on Digital Health & Wireless Solutions, IEEE WCNC, IEEE GlobeCOM, and specific vertical events, like IEEE Healthcom. Finally, for what concerns scientific publications, they will include results about both methodology and findings, and they will target both venues/journals specific to one of the considered verticals (e.g., IEEE Healthcom for eHealth), and to the enabling technologies (e.g., 5G/6G networks, etc.).

Overall, the dissemination plan provides a structured framework for promoting the scientific and technological outcomes of AMAZING-6G across both academic and industrial communities. By combining participation in high-impact conferences, organization of dedicated workshops, collaboration with SNS initiatives, and targeted scientific publications, the project aims to maximize the visibility, accessibility, and long-term impact of its research results throughout the entire project duration.

# 4 Standardization

Standardization remains a key pillar to ensure that the technological innovations developed within AMAZING-6G achieve a sustainable impact beyond the project lifetime and effectively influence the evolution of future 6G systems. At the midpoint of the project, standardization activities have transitioned from an initial scoping and preparation phase (reported in D8.1) to active engagement, including the submission of contributions, participation in working groups, and collaboration with industry stakeholders.

Building on the initial mapping of relevant Standard Developing Organizations (SDOs), the consortium has strengthened its involvement in key bodies such as 3GPP and GSMA, leveraging the participation of several partners already active in these forums. This engagement ensures alignment with ongoing standardization trends while enabling the project to contribute concrete inputs based on its technical developments and use cases.

In particular, the standardization effort focuses on translating project results—especially those derived from the vertical use cases—into actionable contributions addressing emerging requirements in areas such as e-health, public safety, transport and energy.

## 4.1 Standardization tracking

To support a coordinated and structured approach, the standardization tracking mechanism introduced in D8.1 has been actively used and continuously updated. The tracking file consolidates all contributions, interactions, and participation in standardization activities, ensuring visibility across the consortium.

The tracking table has been refined and populated with concrete entries corresponding to activities carried out during the first half of the project. These include contributions to 3GPP and GSMA initiatives.

Compared to the initial version presented in D8.1, the tracking mechanism now provides:

- A consolidated view of contributions across different SDOs
- Traceability of each contribution (meeting, working group, status)
- Linkage between contributions and project WPs, tasks, and use cases
- Visibility on contribution status (e.g., noted, submitted, agreed)

This structured approach has enabled the consortium to monitor progress, identify opportunities for further contributions, and ensure alignment between technical developments and standardization activities.

The tracking table will be updated in D8.3, reflecting new contributions as project results mature.

## 4.2 Standardization contributions

At the midpoint of the project, AMAZING-6G has moved into an active contribution phase, with several submissions and engagements across different SDOs.

**3GPP contributions (SA1 – TR 22.870)**

A major outcome of the standardization effort is the contribution to 3GPP SA1 on 6G use cases, focusing on e-health scenarios.

- An initial contribution on a new medical use case for 6G, led by TNO and co-authored by Telefónica, was submitted to 3GPP SA1 Meeting #111 (August 2025), where it received the status “Noted”.
- Based on feedback and internal refinements, particularly on KPIs (bitrate, service area, energy efficiency), the contribution was revised and resubmitted during Meeting #112 (November 2025).
- The updated version was successfully agreed and included in the ongoing work on TR 22.870 (Release 20).

This contribution is directly linked to the H1 use case (AI-assisted cardiac monitoring) and represents a concrete impact of AMAZING-6G on shaping future 6G service requirements, particularly by addressing gaps related to home-based e-health scenarios, which were not previously covered in SA1 discussions.

**GSMA – User Consent Management**

Beyond 3GPP, the project has actively contributed to GSMA activities in the context of data privacy, trust and user data governance:

- Telefónica led a contribution on User Consent Management within the GSMA Task Force, in collaboration with multiple operators (including Orange, Deutsche Telekom, China Mobile, Verizon, América Móvil, and KDDI).
- The activity resulted in a GSMA Telco Industry Deliverable Study, developed through weekly meetings between November 2025 and February 2026.

This work is directly aligned with the AMAZING-6G T1 use case. In this context, user consent management is essential to ensure that third-party applications (e.g., mobility services or safety applications) can access sensitive information—such as location data—in a controlled, transparent, and compliant way.

The proposed framework defines an end-to-end solution for managing user consent leveraging operator capabilities, including:

- Consent capture and lifecycle management (revocation, expiration)
- Transparency and purpose limitation
- Compliance with GDPR and regional regulations

By addressing these aspects, the contribution supports the realization of scenarios such as T1 use case (protection of vulnerable road users via location sharing), where explicit user consent is a fundamental requirement to enable data-driven services while preserving privacy and trust.

**GSMA – Open Gateway**

In parallel, the project has engaged with GSMA Open Gateway activities:

- NXW has led contributions and presentations have been made on the use of CAMARA APIs in telco environments, including their application to AMAZING-6G transport use cases (T1 and T2).

These interactions strengthen the alignment between project developments and emerging API exposure frameworks, which are expected to play a key role in 6G service ecosystems.

**Overall assessment and next steps**

At this stage, the project has successfully transitioned from preparation to effective standardization impact, demonstrated by:

- Accepted contributions in 3GPP
- Active participation in GSMA initiatives

- Alignment with Open Gateway and API exposure frameworks

Table 4 summarizes the main standardization contributions performed during the first half of the project.

**Table 4. Summary of standardization contributions in AMAZING-6G.**

| Title | SDO | Working group / Work item | Target Study / Work item | Status | Responsible partners | Date | WP and use case related |
|---|---|---|---|---|---|---|---|
| New use case on medical applications in 6G | 3GPP | SA1 | TR 22.870 rel. 20 | Noted | TNO (lead) & Telefónica | 25-29 Aug 2025 | WP2, WP4 – H1 use case |
| New use case on medical applications in 6G | 3GPP | SA1 | TR 22.870 rel. 20 | Agreed | TNO (lead) & Telefónica | 17-21 Nov 2025 | WP2, WP4 – H1A use case |
| User Consent Management | GSMA | User Consent Task Force | N.A. | Noted | Telefónica | Nov 2025 – Feb 2026 | WP2, WP6 – T1 use case |
| Example of CAMARA API implementation for Smart Transport use cases | GSMA | IoT and Open Gateway | N.A. | Noted | NXW | 20 Nov 2025 | WP3, WP6 – T1 & T2 use cases |

For the second half of the project, the standardization strategy will focus on:

- Increasing the number of contributions across multiple WPs and use cases
- Expanding participation in additional SDO working groups (e.g., ETSI and O-RAN)
- Translating mature technical results (e.g., architecture, KPIs, APIs, trial outcomes) into standardization inputs
- Strengthening collaboration with external stakeholders and industrial partners

As project results evolve towards higher TRLs, the consortium expects to further intensify its standardization activities to maximize impact on future 6G specifications and industry adoption.

# 5 Exploitation and business model

This chapter deals primarily with Intellectual Property Right (IPR) management of AMAZING-6G project background and foreground and with exploitation activities, hence the valorisation of project results beyond its duration, especially considering commercial opportunities.

## 5.1 IPR Management

The AMAZING-6G project aims to explore and demonstrate large-scale trials and pilot activities for vertical sectors in the context of B5G/6G networks. Within this vision, collecting and analysing the backgrounds that partners bring to the consortium and how they can be used within and beyond the project is crucial to measure the impact and exploitability of the results. This activity is also essential to ensure a correct IPR management during and beyond the project duration and to understand which assets of different nature are available to the project implementation.

A parallel activity has been undertaken during 2025 for partners' foreground (see the results in D8.1). The definitions of background and foreground are reported below.

- **Background**: any data, know-how or information (but also hardware, software, solutions, etc.), whatever its form or nature (tangible or intangible) including any rights such as IPR that (i) is held by the beneficiary before they acceded to the GA, and (ii) is needed to implement the project or exploit its results.
- **Foreground**: project results, i.e. knowledge subject to intellectual property produced during the project and other knowledge, as well as the intellectual property relating to the produced knowledge (patents, copyright, etc.).

A survey has been launched in the second half of 2025 to collect information on partners' background. As per AMAZING-6G Grant Agreement, partners are expected to give each other access to the backgrounds identified as needed for implementing the action, including any data, knowhow, or information in any form or nature and including rights like IPRs. This however does not preclude partners from bringing backgrounds whose utilisation within the project is limited to the action's own scope, so the survey drafted, distributed, and analysed as part of WP8, Task 8.3 aims to collect those backgrounds necessary to the implementation of the action and understanding how they can be used within the action and beyond.

Results of the survey were presented at the partners' plenary meeting held in Antwerp in 2025.

### 5.1.1 Survey design and distribution

The preliminary background survey has been developed by LINKS. It has been designed as a unique excel workbook, with each partner being assigned a sheet with the survey empty template allowing multiple entries for each partner. The survey included in each sheet a descriptive guide to the compilation including the definition of "background" and the empty structure ready to be filled in to collect the following information:

1. **Background** identification (name) - indicating what was each background about. describing the name of the background, whether a product, service, knowhow, or other.
2. **Brief description** - describing the background more in detail, indicating whether it is hardware, software, a combination of both, dataset, documentation, knowhow, or other assets.
3. **Type of protection** - indicating the following examples: "open source", "restricted use", "license", "copyright", "none".
4. **How the background will be used in the AMAZING-6G project** - aimed at understanding how each background will be exploited within AMAZING-6G scope and activities.
5. **Conditions to use within AMAZING-6G project** - to indicate the specific conditions set by each partner for the use of the background by other partners within the project scope.

6. **Conditions to use outside AMAZING-6G project** - to understand the specific conditions set by partners to use the background outside the project, including options like open source, restricted use, license, copyright, none, or other.
7. **Further information/comments** - to allow further comments, when deemed relevant.

This structure was designed to ensure broad coverage and understanding of the backgrounds brought into the project, while also leaving space for more descriptive entries allowing partners the freedom to best describe the nature, scope, and role of their background/s.

### 5.1.2 Collection and operationalisation

Partners were given four months to allow detailed and complete compilation of the survey. After the agreed deadline, the survey results were collected to be analysed. This required the interpretation and operationalisation of some answers into more measurable, comparable formats. For example, including descriptive and open-ended room for each background, while allowing greater freedom for each partner to describe the type of background, would have resulted in nearly all-unique types of backgrounds.

For this reason, the choice was made to interpret and operationalise the following survey answers into more actionable variables:

1. **Brief description**: the multitude of different information emerged from the survey were analysed and merged into broader categories for assessment. These consisted of one of the following categories: software, hardware, dataset, documentation, expertise, or any combination of these. The rationale for translating the description into one of these types of backgrounds was based on the common understanding associated with the main components, nature, or function of the described background.
2. **Type of protection**: this variable included several options (Ex. “open source”, “restricted use”, “license”, “copyright”, “none” etc.), but, based on the feedback collected from the AMAZING-6G Consortium, it was decided to translate the answers into either copyright, license, restricted use, open source, or none.
3. **Conditions to use outside the AMAZING-6G project**: this question too resulted in a multitude of different answers, with subtle variations adding unnecessary complexity to the evaluation of the backgrounds. Therefore, the answers were interpreted according to the following options for presence of conditions to use beyond the project: No, Yes – upon agreement, Yes – open source, Yes – under license, and N/A.

This interpretation facilitated the analysis of responses by partners by unifying answers into more standardised variables.

The definitions in Table 5 are provided to allow better understanding of the categories mentioned above.

**Table 5: Results categories definition**

| Term | Definition |
|---|---|
| **Software** | Computer programmes in source code or executable form that instruct a digital device to perform specific tasks. Includes operating systems, applications, embedded firmware, virtual assistants, and scripts that process input to generate output (e.g., commands, data transformation, automated decisions). |
| **Hardware** | Physical electronic components and devices that process, store, or transmit data. Encompasses processors, memory chips, circuit boards, sensors, network interfaces, servers, peripherals (keyboards, displays), and integrated components. |

| | |
|---|---|
| **Datasets** | Organised collections of data in digital form, where each datum represents a value for a variable within the collection. Datasets list values for each member (row) and variable (column), structured to enable analysis, retrieval, or reuse. |
| **Documentation** | Technical, instructional, or administrative written materials accompanying software, hardware, or datasets. Includes user manuals, technical specifications, API guides, metadata descriptions, installation instructions, and design documents that enable understanding, operation, modification, or maintenance of digital systems. |
| **Expertise** | Human knowledge, skills, technical know-how, and professional competencies. Encompasses specialized abilities, tacit knowledge gained through practice, and undisclosed methodologies or processes that enable creation, operation, or improvement of systems and processes. |

### 5.1.3 Result analysis

The results presented valuable information on the amount, type, and potential usability of each partner's background within and beyond AMAZING-6G. This section reports a set of descriptive statistics to show the distribution of survey replies.

The total amount of backgrounds (**43**) was distributed per partner as shown in Figure 8, with partners indicating no background excluded from the graph.

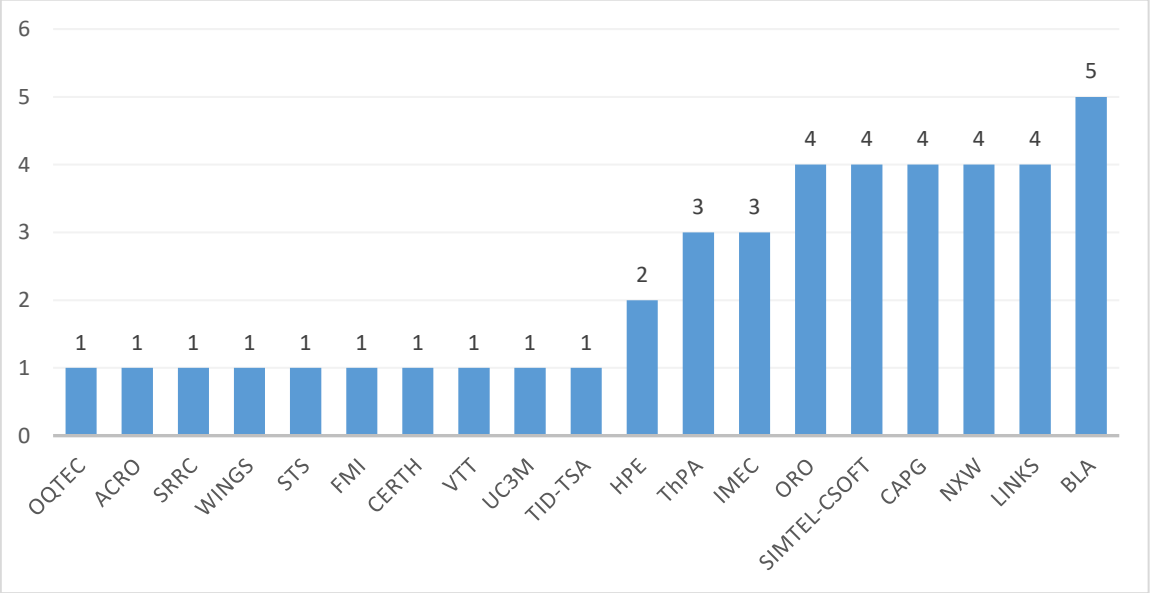


**Figure 8: Background distribution per partner**

Background was considered by total number and category, with software, expertise, and software-hardware combinations representing the majority, as shown in Figure 9.

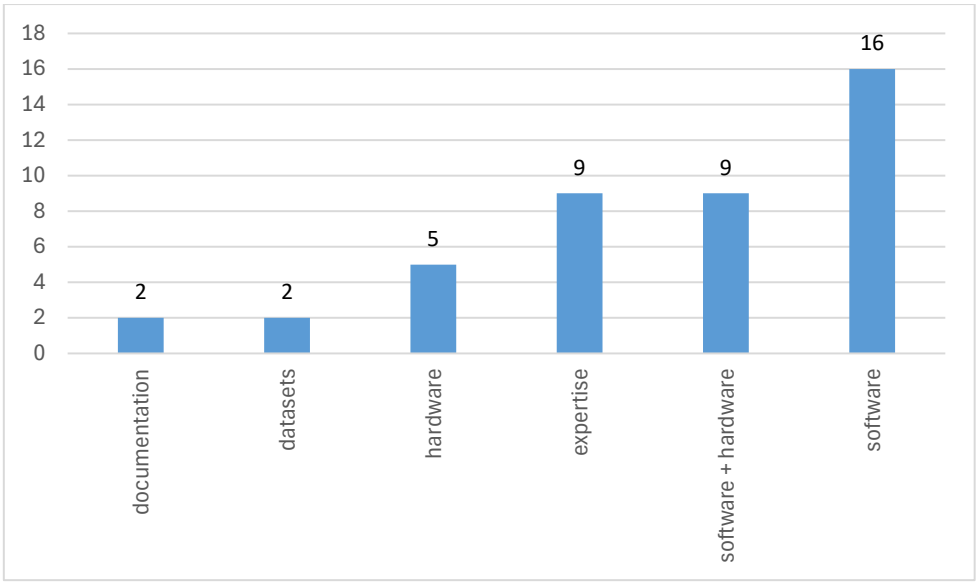


**Figure 9: Background distribution by category**

Analysing the distribution based on the type of protection (Figure 10), restricted use stood as the most common type (23), followed by copyright (8), none (6) open source (3), and license (3).

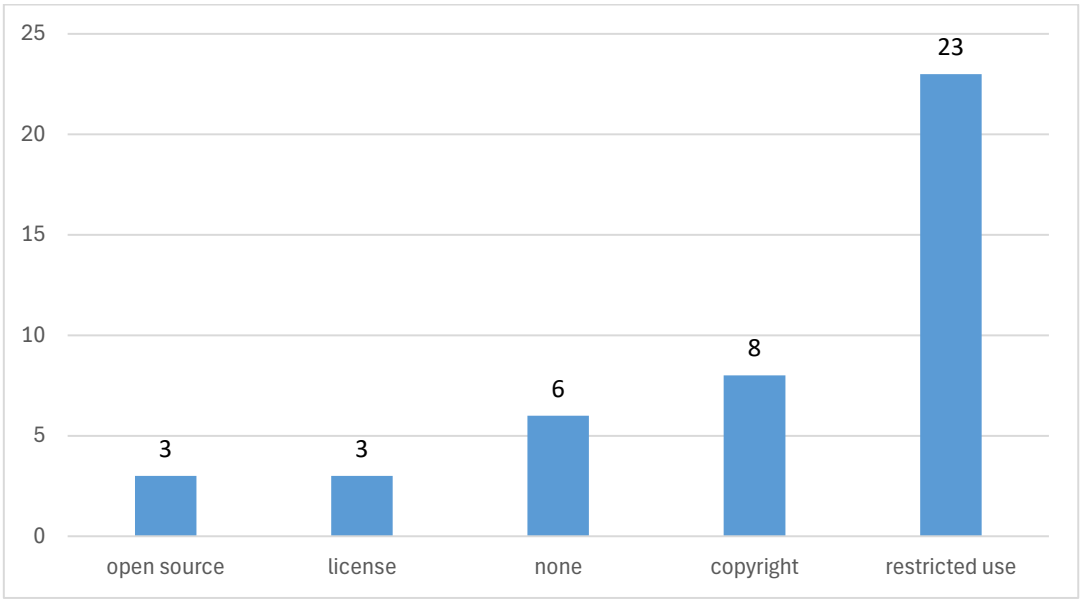


**Figure 10: Background distribution by type of protection**

When looking at the conditions and possibility for usage beyond the project (Figure 11), the majority of backgrounds foresaw the possibility of usage outside of AMAZING-6G, with 12 backgrounds indicating of usability upon agreement, 5 under license, and 3 as open source plus 4 under other conditions as opposed to 16 backgrounds being described as not usable outside of AMAZING-6G.

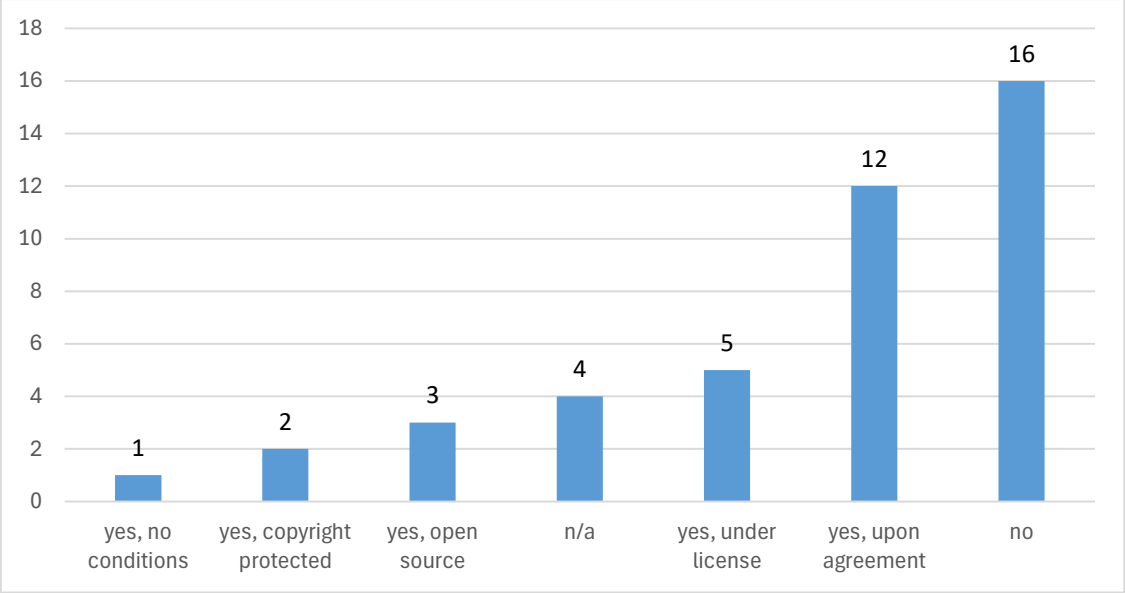


**Figure 11: Background distribution by usability (and conditions) beyond AMAZING-6G project**

Details on each background are not included in this deliverable due to confidentiality reasons.

## 5.2 Exploitation

Exploitation activities, in the context of AMAZING-6G project are operationalized via two main paths:

- Exploitation of project expected results (foreground), considering especially Key Exploitable Results (KERs).
- Exploitation of uses cases, considering them as "commercialisation scenarios" where one or multiple partners translate the use case into business opportunities.

There is clearly the potential for substantial overlapping between the assessments in the two paths, however, further analysis will evaluate synergies between these parallel operationalisations.

As D8.1 contains the initial evaluation of foreground, this deliverable deals with use cases exploitation potential. D8.3 will provide the results of a further analysis on foreground (KERs).

### 5.2.1 Study design and templates

The AMAZING-6G project works on 15 use cases, distributed as summarized in Table 6.

**Table 6: Use case distribution across domains**

| Domain | Number |
|---|---|
| Health | 2 |
| Public safety | 5 |
| Energy | 3 |
| Transport | 5 |

LINKS has designed and delivered two workshops to collect information on each use case and allow project partners to work together and reflect on the development of commercialisation scenarios. The first workshop was held online on April 20th, 2026, while the second was held in-person during the plenary meeting in May of the same year (Thessaloniki, Greece). Workshops design required a long process of use case analysis (especially based on D4.1, D5.1 and 6.1) to understand the potential commercial operationalisation for each of them.

Workshops consisted of two steps.

1- The first step referred to the completion of a Microsoft Word template, for each use case, that guided the user (a use case representative) in a brainstorming session to identify the commercialisation scenario. The annex to this document reports this template.
2- The second step was instead focused on creating a "reference model", a graphical representation of the business model scenario which highlights the key actors involved (both considering partners from AMAZING-6G project and external ones), the main products, services and assets and the related monetary flows. This step has been proposed to support the user to visualize the commercialization scenario in an easier way.

The participants to the workshop were guided by LINKS during the completion of the two files.

The following sections report the results of the workshops and the subsequent elaborations. A standardized format has been followed for each use case.

#### *5.2.1.1 H1 - Wearable ultrasound patch for cardiac function monitoring*

**Use case derived product/service**

A wireless echocardiography (ultrasound) patch with AI solution for automated left ventricular function measurement and integration with ECG signals for timing of cardiac events and for multimodal input to AI model. It measures and monitors left heart function in patients with risk of heart failure, both on a chronic and acute and acute upon chronic level.

**Target customer**

Prehospital service providers, hospitals, home health service providers.

**Customer needs/problems (addressed by the product/service)**

- Heart function monitoring for early discharge of patients after surgery.
- Continuous monitoring of heart failure in hospital intensive care.
- Home-based heart function assessment as part of regular workup of patients in line for heart surgery to minimize need for hospital checkups and maximise safety on waiting list.

**Existing products/services currently addressing the same needs/problems**

- Patients are served by staying longer in hospital and going to checkups after discharge.
- Patients are served by proxyparameters/surrogates. There is no solution at present for left heart function continuous monitoring.
- Frequent checkups in hospital outpatient clinics and with general practitioners.

**Advantage of the use case product/service compared to existing solutions**

- Lower cost.
- Increased safety.
- Improved detection.
- Less complications.
- Lower risks.

**Use case product/service pitch**

A patch containing an ultrasound sensor (transducer) produces images of the heart when attached to the patients' chest. The images are analysed by an AI algorithm that gives a number (ejection fraction estimate) for heart function that in addition to the images can be seen in real time with wireless transfer to an expert at a hospital. Alarm limits can be made for actions such as: call intensivist (in hospital), admit to hospital (when home), come earlier to clinic for checkup (when home on waiting list), etc. There is the option for other signal modalities to be included in AI prediction model to improve sensitivity and specificity for reduced heart function.

**Actors and related roles required in the use case commercialisation scenario**

Actors and key flows are presented in Figure 12.

- Ultrasound probe/patch producer: for patch/probe supply.
- Ultrasound system producer: for the system supply.
- Network operator: for network connection provision.
- System integrator and solution integrator: for the solution assembly and the commercial distribution.

Use case leader role: OUS could act as AI algorithm and application developers. OUS would further work on new AI models and additional versions.

**Other commercialisation scenarios**

Vascular imaging, fetal monitoring and other ultrasound imaging areas.

**Reference model**

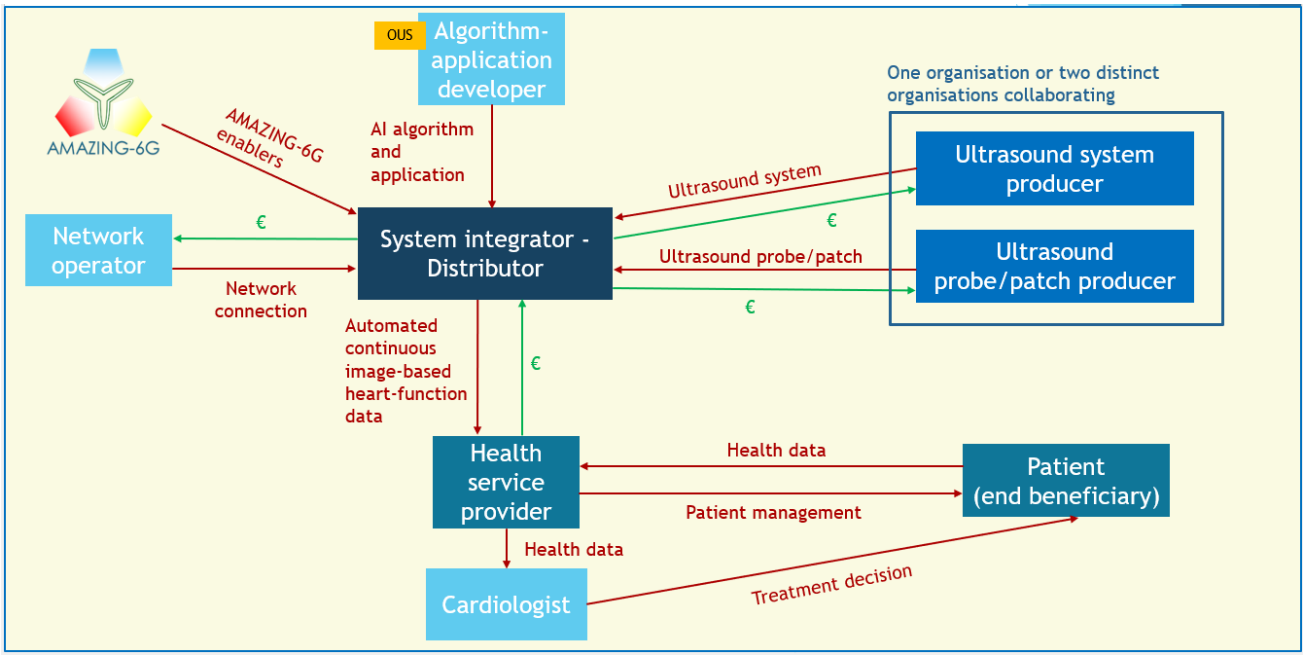


**Figure 12: Reference model for H1**

### *5.2.1.2 H2 - Predictive remote reprogramming of implantable cardiac devices*

**Use case derived product/service**

A time-critical, event-aware body area network is envisioned, composed of distributed sensing and actuation elements, where actuators must respond to detected physiological events within strict temporal constraints to prevent severe anomalies or irreversible damage. The solution provides an edge-executed, latency-aware software framework that adaptively determines the optimal prediction horizon

for event detection in order to minimize actuation timing error while jointly accounting for end-to-end closed-loop latency and forecasting model accuracy. The proposed platform can support a wide range of healthcare and neuroengineering applications, including Cardiac Rhythm Management (CRM) (e.g., wearable defibrillation and implanted pacemaker), Functional Electrical Stimulation (FES) for movement assistance, attenuation of essential tremor through peripheral nerve stimulation, and responsive neurostimulation (RNS) systems for seizure prediction and timely stimulation delivery. The end user is required to provide a signal encoder for feature extraction together with the temporal labels corresponding to the target anomaly or event.

**Target customer**

- Medical device manufacturers developing closed-loop therapeutic systems, such as Medtronic, Abbott, Boston Scientific, or NeuroPace. These companies build devices for cardiac rhythm management, neurostimulation, wearable monitoring, and implantable therapeutic systems where latency-aware actuation is critical.
- Healthcare robotics and rehabilitation technology companies working on functional electrical stimulation (FES), assistive robotics, prosthetics, and neuromodulation platforms.
- Telecom operators and 6G infrastructure vendors interested in semantic-aware and goal-oriented wireless control systems, including Ericsson and Nokia.
- Edge AI and embedded systems companies building ultra-reliable low-latency (URLLC) platforms for healthcare and industrial automation.
- Hospitals, digital health providers, and clinical research centres deploying personalized closed-loop monitoring and stimulation systems.
- Research laboratories and universities developing next-generation wireless biomedical systems, brain-computer interfaces, and adaptive sensing-actuation networks.

**Customer needs/problems (addressed by the product/service)**

- Latency-aware AI middleware.
- Network-aware prediction optimization engine, optimized sensing and actuation resources.

**Existing products/services currently addressing the same needs/problems**

Current products and platforms already support low-latency edge inference, real-time sensing, closed-loop actuation, and AI-assisted control, as demonstrated by platforms such as NVIDIA Holoscan, Derq SENSE, and emerging neuroadaptive systems such as Esmé SX. These solutions primarily focus on reducing inference latency, improving edge execution efficiency, and enabling real-time response. However, most existing systems still optimize communication latency, inference latency, and prediction accuracy as largely independent objectives. In particular, they do not jointly model stochastic network latency, packet retransmissions, latency jitter, and adaptive prediction horizon selection within a unified task-oriented framework, such as the proposed latency-aware root mean square error (LA-RMSE) for actuation time estimation.

**Advantage of the use case product/service compared to existing solutions**

The proposed framework introduces several novel concepts beyond conventional low-latency edge intelligence systems by enabling latency-aware forecasting, where the actuation prediction timing is adaptively adjusted according to the instantaneous network conditions, and task-oriented network evaluation, where the communication infrastructure is optimized based on actuation effectiveness rather than raw latency minimization alone. The framework further enables joint optimization of AI inference and wireless communication by integrating prediction accuracy with stochastic latency probability distributions, while dynamically adapting the prediction horizon to forecast earlier under degraded network conditions and later under stable communication regimes. In addition, the proposed approach supports closed-loop semantic-aware networking by aligning communication resource allocation with the probability of successful and timely actuation. Consequently, the proposed direction

is strongly aligned with emerging 6G research paradigms, including edge intelligent sensing, task-oriented communication, semantic-aware networking, and AI-native wireless systems.

**Use case product/service pitch**

N/A

**Actors and related roles required in the use case commercialisation scenario**

N/A

**Other commercialisation scenarios**

N/A

**Reference model**

N/A

#### *5.2.1.3 P1 - Ubiquitous B5G/6G communication and slice deployment across operators for PPDR AR/VR assisted Control Centres*

**Use case derived product/service**

A portable and rapidly deployable B5G solution tailored for Public Protection and Disaster Relief (PPDR) scenarios, enabling on demand deployment of a private mobile network, with edge computing capabilities, and mission-critical services in disaster affected areas where public network infrastructure is unavailable, overloaded, or damaged.

**Target customer**

The primary customers would be public safety and emergency response organisations, such as civil protection agencies, disaster response authorities, emergency medical services, humanitarian organisations, police forces, and fire brigades.

**Customer needs/problems (addressed by the product/service)**

This solution addresses critical needs of PPDR organizations, including the instant connectivity and operational readiness for reliable communication between first responders, control and command centres, including local processing and analytics at the edge. It can also enable the seamless interconnection with available terrestrial or non-terrestrial networks (NTN) for enhanced situational awareness and decision-making, involving remote agencies.

**Existing products/services currently addressing the same needs/problems**

Currently, most PPDR operations rely heavily on existing commercial 4G/5G public mobile networks, legacy communication systems such as TETRA, or satellite communication units. Existing portable solutions can be deployed to restore connectivity; however, these approaches have limitations on efficiently supporting edge computing or applications such as real-time video analytics, XR/VR services, and AI-assisted operations.

**Advantage of the use case product/service compared to existing solutions**

- Rapid deployment enabling operational readiness within minutes.
- Autonomous operation with minimal configuration requirements.
- Integrated edge computing for low-latency and AI-assisted processing.
- Automatic network configuration, service orchestration and prioritisation tailored to the emergency requirements.
- Seamless interoperability with terrestrial and non-terrestrial networks.

**Use case product/service pitch**

A portable private B5G/6G solution, designed for rapid deployment in mission-critical scenarios, providing high-performance reliable communication to emergency acting teams. It enables ubiquitous connectivity, real-time data processing, dynamic network configuration and support for advanced PPDR applications, even when public infrastructure is unavailable.

**Actors and related roles required in the use case commercialisation scenario**

Actors and key flows are presented in Figure 13.

- Private network testbed (mobile network and edge/cloud computing infrastructure): provides the radio access equipment (including antenna and power supply), core network functions (authentication, mobility management, slicing, QoS), computing resources for hosting mission-critical applications locally.
- Application provider: delivers PPDR-specific services such as mission-critical push-to-talk, emergency incident detection, and situational awareness supporting tools. This includes user equipment suitable for the PDDR operational environments.
- Research organisation: contributes to innovation, interoperability, validation, and alignment with evolving B5G/6G standards.
- Telecom operator: facilitates interoperability and supports roaming with public terrestrial or non-terrestrial infrastructure when available.
- System integrator: combines all components into a unified solution, ensuring interoperability, automation, and lifecycle management.

Use case leader role: UPAT could act as the Research organisation, leading technology innovation and driving the solution development as a reference architecture, ensuring the proper customization to meet the network requirements of the vertical domain (PPDR services, mission critical operations). The commercialisation could be performed through partnership with the other contributors of the use case, or other actors targeting the public safety sector. The solution could be commercialised directly through the channels of the industrial partners involved in this use case. An alternative could be a telecom operator (as intermediate actor) with existing relationship to the partners and the PPDR market. UPAT would primarily contribute to technology transfer, pilot deployments, training, and technical support, while industrial partners would handle large-scale commercial deployment and customer support. UPAT is expected to remain involved after deployment, for the evolution of the solution with new B5G/6G features and AI capabilities, performance optimisation, technical support and training to students, researchers, engineers from the local ecosystem of technology companies.

**Other commercialisation scenarios**

Although initially designed for PPDR scenarios, the solution could be adapted to relevant use cases requiring temporary, resilient, or mission-critical connectivity. Potential applications include large-scale public events, smart-city deployments and industrial operations.

**Reference model**

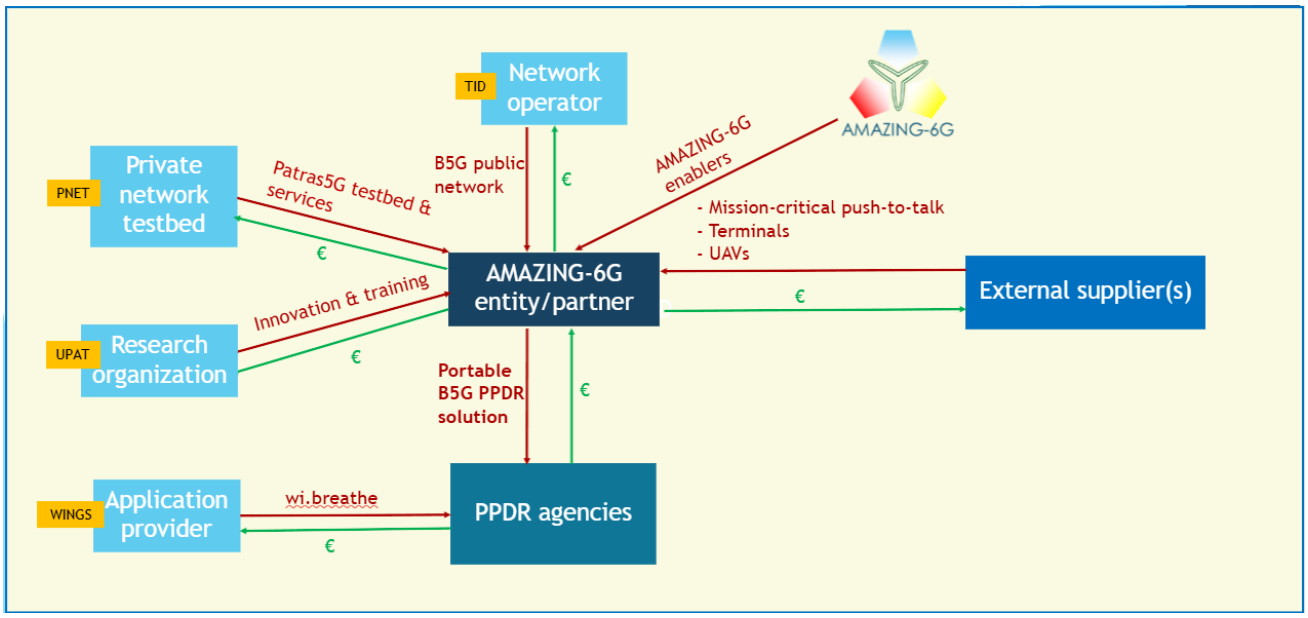


**Figure 13: P1 reference model**

### *5.2.1.4 P2 - Mission critical services interoperability with other systems*

**Use case derived product/service**

A Multi-Access Mission-Critical Connectivity Manager that enables seamless interoperability between B5G/6G, Wi-Fi, and satellite networks, providing uninterrupted, prioritised connectivity for first responders across heterogeneous networks.

**Target customer**

- Public Protection and Disaster Relief (PPDR) authorities.
- Emergency response organisations and national safety agencies.
- Defence and border control organisations.
- Operators of mission-critical vehicle fleets.

**Customer needs/problems (addressed by the product/service)**

- Uninterrupted connectivity across heterogeneous networks.
- Reliable communication in remote or cross-border scenarios.
- Automatic network selection and roaming without manual intervention.
- Guaranteed QoS for mission-critical applications such as live video.

**Existing products/services currently addressing the same needs/problems**

Currently, these needs are addressed by separate and loosely integrated solutions such as public mobile networks, satellite modems, and Wi-Fi systems, which require manual configuration and lack intelligent coordination, real-time optimization, and seamless service continuity.

**Advantage of the use case product/service compared to existing solutions**

- Seamless interoperability between 3GPP and non-3GPP networks.
- Intelligent, automated network selection using real-time KPIs.
- Improved reliability through multi-network redundancy.
- Built-in service prioritization for mission-critical traffic.

**Use case product/service pitch**

A solution enabling uninterrupted mission-critical communications by dynamically selecting and combining 5G, Wi-Fi, and satellite connectivity. It ensures reliable, high-quality service for first responders even in remote or degraded environments.

**Actors and related roles required in the use case commercialisation scenario**

Actors and key flows are presented in Figure 14.

- Mobile network operator: providing B5G/6G connectivity and roaming support.
- Satellite provider: ensuring coverage in remote or uncovered areas.
- Wi Fi vendor: supplying local high-capacity connectivity.
- Core network/API provider: enabling exposure of network KPIs and control functions.
- Vehicle/platform integrator: integrating the solution into emergency vehicles.
- System integrator: building and deploying the end-to-end solution.

Use case leader role: VTT would act as a technology developer and validation partner, designing the interoperability mechanisms, AI-assisted network selection logic, and evaluating system performance in realistic scenarios. VTT would support further development, optimisation, validation, and evolution of the solution, especially as B5G and 6G technologies mature. Commercialisation would primarily occur via system integrators or network solution providers, rather than directly by VTT.

**Other commercialisation scenarios**

None.

**Reference model**

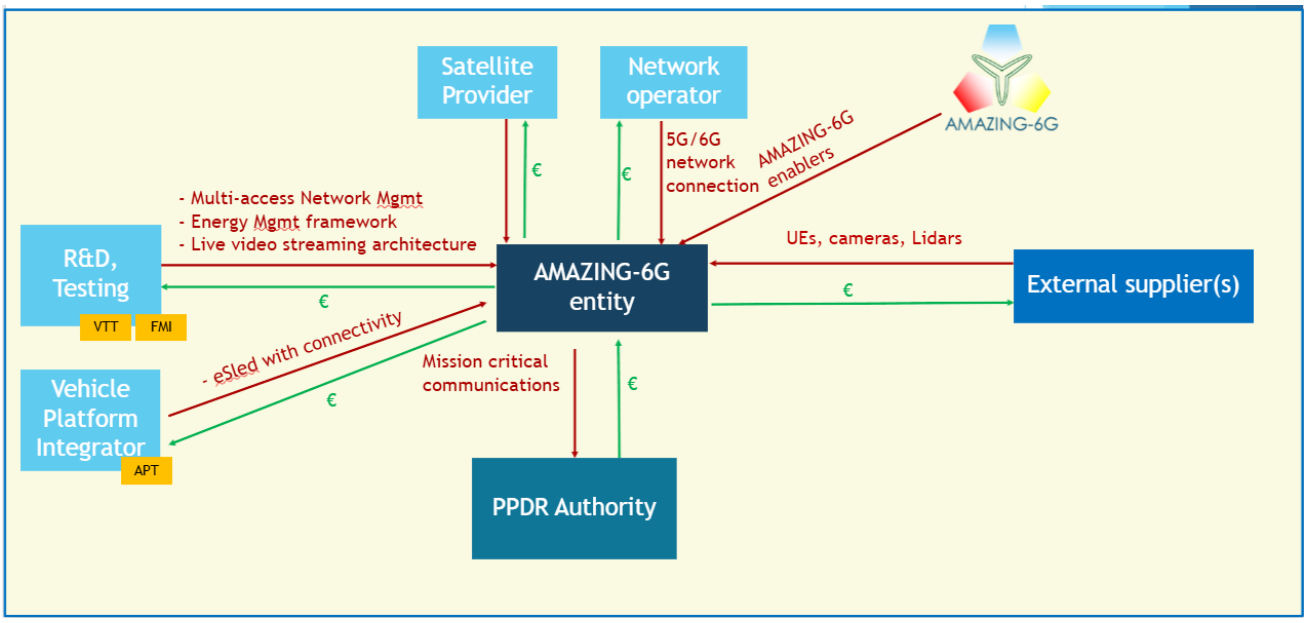


**Figure 14: P2 reference model**

### *5.2.1.5 P3 - Emergency private 5G/6G communication on-the-Move*

**Use case derived product/service**

A Mission-Critical Private Network-in-a-Box solution that enables rapid deployment of secure, autonomous B5G/6G networks with edge services (video, analytics, LiDAR) for PPDR operations, with or without public network integration.

**Target customer**

- Public Protection and Disaster Relief (PPDR) authorities (police, fire brigades, civil protection).
- Government agencies and municipalities.
- Defence and border security organisations.
- Critical infrastructure operators.

**Customer needs/problems (addressed by the product/service)**

- Reliable communication in areas without public network coverage.
- Secure and isolated connectivity for mission-critical operations.
- Low-latency edge processing for video, sensor, and situational-awareness data.
- Prioritised traffic and guaranteed QoS for critical users and applications.

**Existing products/services currently addressing the same needs/problems**

The indicated needs are currently addressed by commercial public mobile networks, PMR systems (e.g. TETRA), or ad-hoc satellite links, which provide limited bandwidth, lack flexible edge services, and offer insufficient control over QoS, slicing, and local autonomy.

**Advantage of the use case product/service compared to existing solutions**

- Works fully offline or in hybrid public-private mode.
- Provides network slicing and traffic prioritisation tailored to missions.
- Integrates edge computing and analytics close to users.
- Higher resilience, security, and deployment flexibility.

**Use case product/service pitch**

A solution that delivers a deployable private B5G/6G network with built-in edge services for mission-critical operations. It ensures secure, reliable, and low-latency connectivity in isolated or overloaded environments.

**Actors and related roles required in the use case commercialisation scenario**

Actors and key flows are presented in Figure 15.

- RAN hardware supplier: for the provision of radios and base stations for field deployment.
- Core network vendor: for the supply of 5G/B5G core functionality and slicing support.
- MEC provider: enabling low-latency edge services and data processing.
- Device/sensor supplier: for the supply of cameras, LiDARs, and UEs used in missions.
- System integrator: for the integration of all components into a deployable solution.
- Network operator: for facilitates spectrum access and public–private integration.

Use case leader role: VTT would act as a technology provider and solution architect, contributing to system design, validation, and advanced features, while supporting pilots and precommercial deployments. VTT would support updates, performance optimisation, validation, and evolution of the solution, especially for new features and future 6G capabilities.

**Other commercialisation scenarios**

The solution could also be applied to defence training, industrial campuses, remote mining, ports, large events, and critical infrastructure protection, where reliable private connectivity is required.

**Reference model**

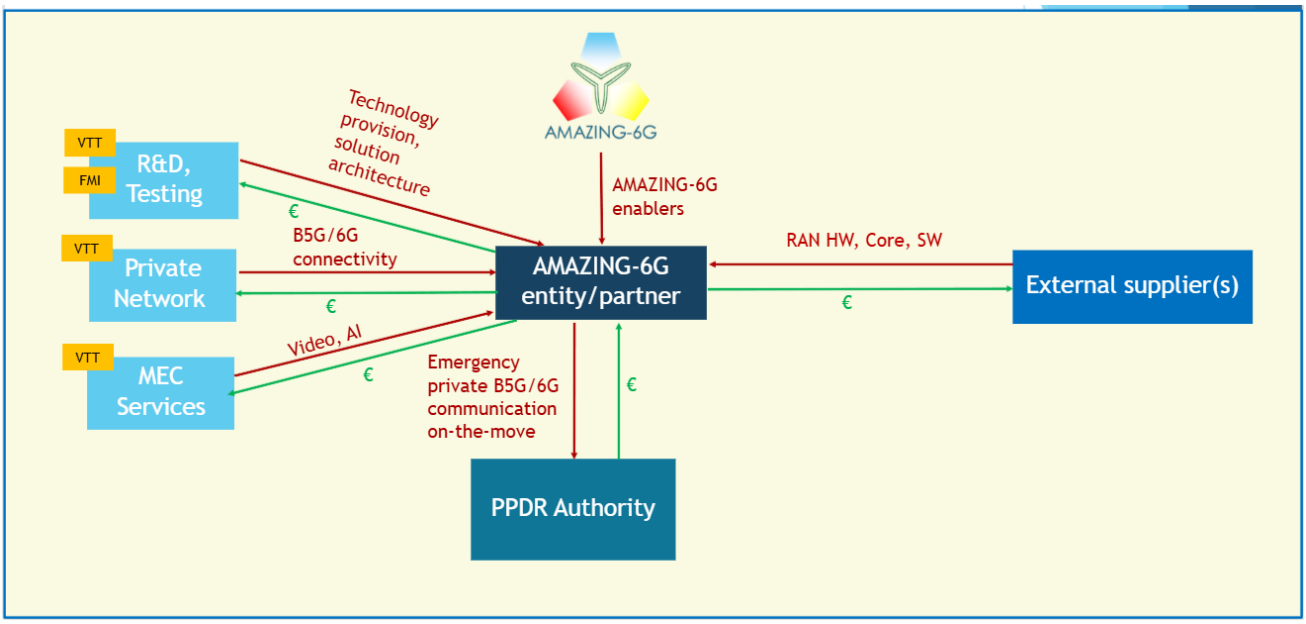


**Figure 15: P3 reference model**

### *5.2.1.6 P4 - Arctic Area Search and Rescue Operation*

**Use case derived product/service**

Digital modelling for search and rescue organisations.

**Target customer**

Public or private safety organisations.

**Customer needs/problems (addressed by the product/service)**

Improved live area knowledge with different systems at the same time.

**Existing products/services currently addressing the same needs/problems**

Currently video feed might be the only one used.

**Advantage of the use case product/service compared to existing solutions**

- Improved network resources.
- Higher data volume transmissible via the same channel.

**Use case product/service pitch**

A data stream management between a user and the monitoring centre, maintaining the cleanest/highest data quality (as good as video feed as possible).

**Actors and related roles required in the use case commercialisation scenario**

Actors and key flows are presented in Figure 16.

**Other commercialisation scenarios**

The solution might be developed also to serve event venue providers or small-scale sport clubs perhaps. In addition, it may be of interest of construction companies needing a real time image of the areas.

**Reference model**

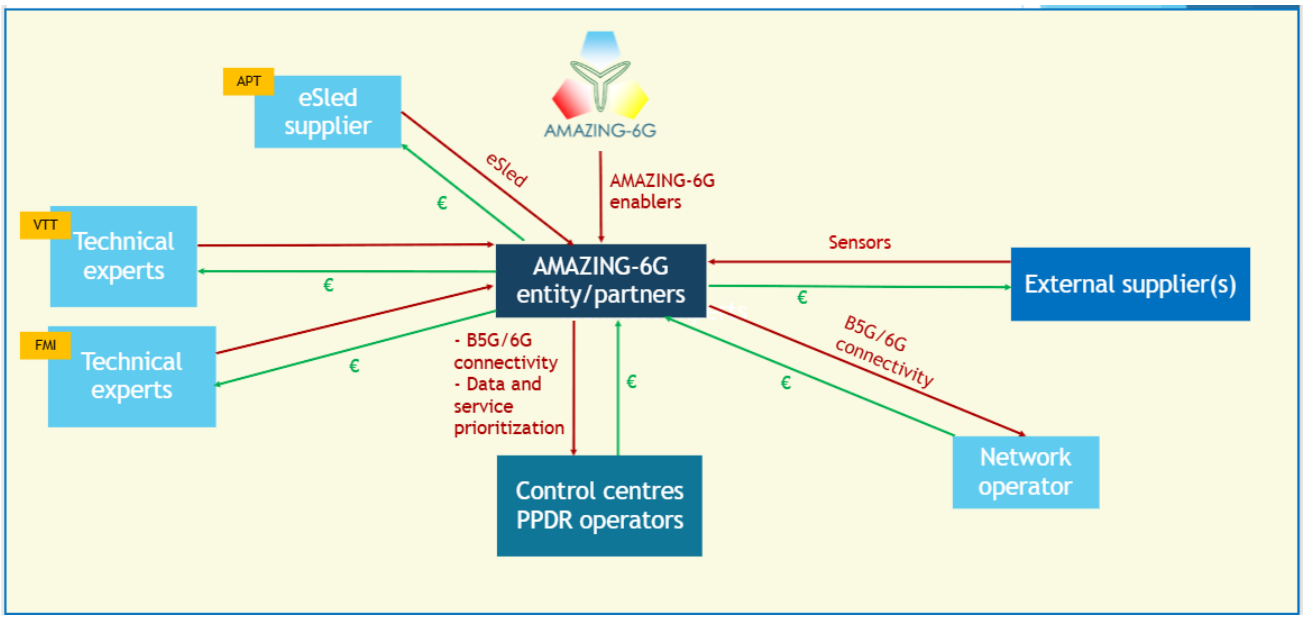


**Figure 16: P4 reference model**

### *5.2.1.7 P5 - Emergency private 5G/6G communication on-the-move*

**Use case derived product/service**

A rapidly deployable private B5G/6G tactical communication system providing autonomous MCx services (MC-PTT, MC-Video, MC-Data) with edge computing and optional satellite backhaul for PPDR operations.

**Target customer**

Public safety agencies, emergency response units, civil protection authorities, and defence organizations requiring mission-critical field communications.

**Customer needs/problems (addressed by the product/service)**

- Ultra-reliable low-latency communication.
- Rapid network deployment in infrastructure-less areas.
- Resilient service continuity under backhaul degradation or absence.

**Existing products/services currently addressing the same needs/problems**

These needs are currently addressed by legacy PPDR systems (e.g., TETRA) and partially by public 4G/5G networks, which provide basic voice/data services but lack broadband capacity, low latency, and autonomous edge operation.

**Advantage of the use case product/service compared to existing solutions**

The solution provides

- Lower latency
- Higher throughput
- Autonomous operation without backhaul
- Integrated edge-based MCx services with network slicing and MBS support.

**Use case product/service pitch**

A mobile private B5G/6G network-in-a-box enabling mission-critical broadband services with local core and edge processing, deployable within minutes in disconnected or degraded environments. It ensures seamless operation across standalone and satellite-connected modes.

**Actors and related roles required in the use case commercialisation scenario**

- Equipment vendors: for the supply of RAN and core components.
- Satellite providers: to ensure backhaul connectivity.
- Edge/cloud providers: enabling local processing.
- MCx vendors: for the delivery mission-critical applications.
- System integrators: handling deployment and integration.

Use case leader role: ORO acts as solution provider and system integrator, delivering and potentially commercializing the end-to-end tactical communication system to PPDR customers. The organization remains involved during post-deployment for system maintenance, software updates, network optimization, and operational support.

**Other commercialisation scenarios**

The solution application can be extended to defence operations, industrial remote sites, large-scale events, and temporary connectivity scenarios in infrastructure-limited environments.

**Reference model**

N/A

#### *5.2.1.8 E1 - Renewable Energy Communities*

**Use case derived product/service**

Energy Management System (EMS) for smart buildings and Renewable Energy Communities (REC).

**Target customer**

Smart building owners, smart building managers, smart building designers, REC managers.

**Customer needs/problems (addressed by the product/service)**

- Optimization of energy consumption in the smart building.
- Optimization of the comfort perceived in the smart building, while keeping energy consumption under control.
- Global optimization of energy consumption at the REC level, with automatic adjustment of loads considering the renewable energy sources.

**Existing products/services currently addressing the same needs/problems**

- Static, predefined and manual configurations, with limited adaptation to external conditions and users' profiles.
- Limited adoption of AI, without joint optimization of energy consumption and user comfort.

**Advantage of the use case product/service compared to existing solutions**

Higher efficiency and lower operational costs for the smart building management, scalability to the REC level beyond the optimization of the single building, better perception of the implication of users' behaviour on energy consumption, joint optimization of energy optimization and user comfort.

**Use case product/service pitch**

An Energy Management System for smart buildings that jointly optimizes energy consumption and user comfort, using advanced AI/ML techniques, Internet of Things, and smart connectivity to dynamically tailor energy consumption to user profiles and behaviour. The solution easily scales to Renewable Energy Communities for global optimization and energy sharing strategies.

**Actors and related roles required in the use case commercialisation scenario**

Actors and key flows are presented in Figure 17 and Figure 18.

- Cloud service provider: provider of the cloud infrastructure where the centralized components of the SB-EMS application are running.
- Mobile network operator: provides the mobile network connectivity for the communications with the IoT devices.
- Supplier of IoT devices: vendor of IoT devices for programmable appliances, smart meters, HVAC, etc.

Use case leader role: NXW will be the main entity to realize and commercialize the product. The service on top of it (for the REC level) can eventually be commercialized by a different entity. It will be involved also in post-sale for periodical maintenance, planned software upgrades, or extensions of the system.

**Other commercialisation scenarios**

The product is initially designed for residential smart buildings, but it can be applied to other types of buildings, like smart offices or smart campuses.

**Reference model**

E1 has two potential options.

**Option1**

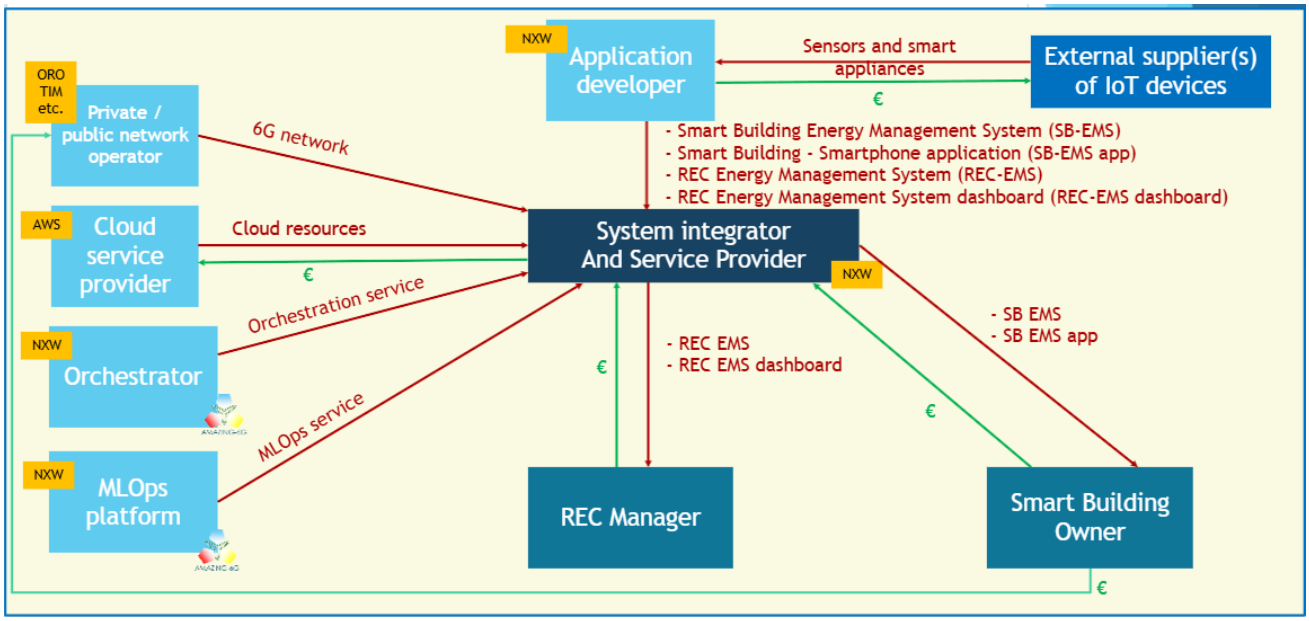


**Figure 17: E1 reference model option 1**

**Option2**

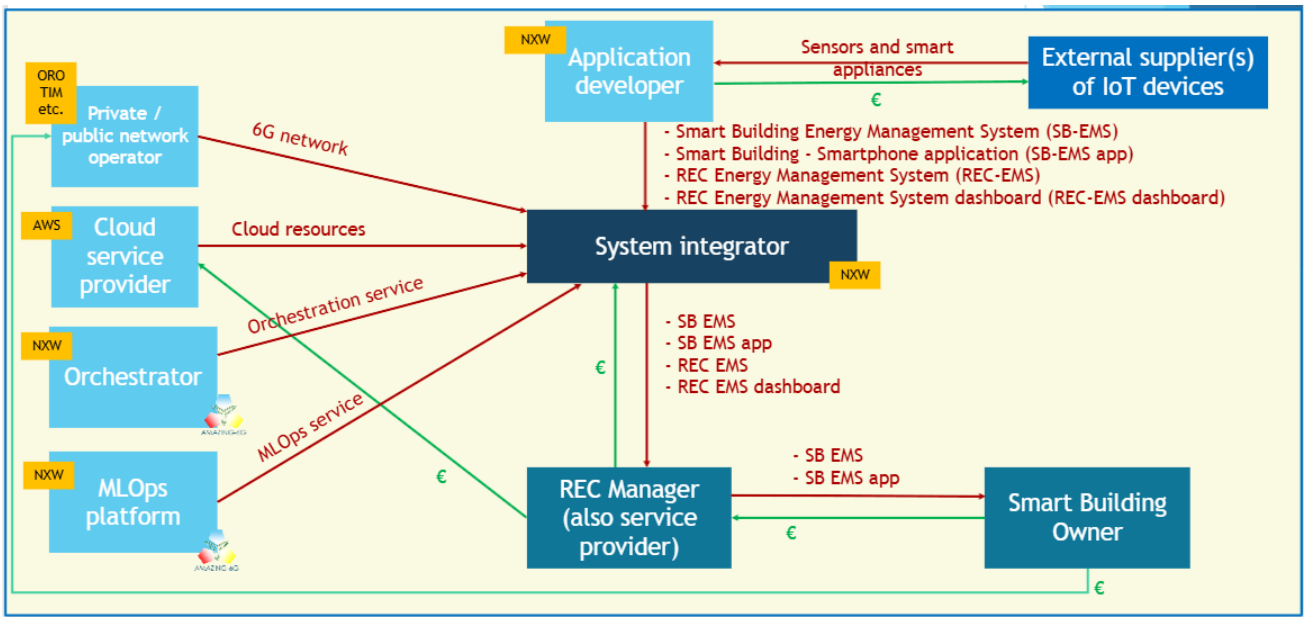


**Figure 18: E1 reference model option 2**

### *5.2.1.9 E2 - Robotized offshore wind turbine blade inspection and maintenance*

**Use case derived product/service**

An end-to-end inspection system combining a sensor-equipped aerial robot, 5-6G powered edge processing unit, and digital twin platform designed as one integrated stack. The sensors, flight planning, and analytics are co-developed so that data acquisition, processing, and defect detection are optimized together rather than stitched from generic components.

The operator deploys the system, inspects a turbine, and receives a structural health assessment with maintenance recommendations, all within hours rather than weeks. Each inspection updates the asset's digital twin, improving future predictions.

**Target customer**

Offshore wind farm operators (Ørsted, Vattenfall, RWE, Equinor): they pay for inspections and want faster, cheaper asset health insights. They're the end users.

Telecom operators seeking industrial 6G use cases (KPN, Deutsche Telekom, Nokia private networks) providing vertical applications to justify 6G infrastructure investment. The system becomes a flagship offshore deployment case, potentially as a co-commercialization partner rather than a customer.

**Customer needs/problems (addressed by the product/service)**

- Reduce inspection cost and downtime: eliminating vessel mobilization, rope access teams, and weather waiting windows cuts both direct costs and lost production time significantly.
- Actionable insights, not raw data: operators currently receive inspection reports weeks later and still need engineers to interpret them. They need automated, prioritized maintenance recommendations they can act on immediately, moving from periodic snapshot inspections to a continuously updated structural health record.
- High speed data sharing environment: enabling a range of applications for remote offshore wind farms.

**Existing products/services currently addressing the same needs/problems**

- Inspection cost and downtime: currently addressed through crewed vessel campaigns with rope access technicians or jack-up barges. Some operators use basic drone photography, but it's still a "fly, collect, download, send to analyst" workflow. Expensive, weather-dependent, and slow to mobilize.
- Actionable insights: handled by specialized inspection consultancies that send reports weeks after data collection. Interpretation remains largely manual.
- Degradation tracking: mostly done through spreadsheets and periodic inspection comparison by experienced engineers.

**Advantage of the use case product/service compared to existing solutions**

Faster decision making due to near real-time data analysis. Currently the data is analysed after the inspection session finished (if something is found, there is a need to go back to the offshore location). Lower operating costs due to less boat transfers to offshore locations.

**Use case product/service pitch**

An integrated robotic inspection system that combines a sensor-equipped drone, private 6G connectivity, and edge-based analytics to deliver real-time structural health assessments of offshore wind assets. It replaces fragmented, manual inspection workflows with a single deploy-to-decision pipeline that gets smarter with every inspection cycle.

**Actors and related roles required in the use case commercialisation scenario**

Actors and key flows are presented in Figure 19.

- Drone/robotics manufacturer: for the hardened aerial platform capable of operating in marine conditions.
- Sensor specialists: co-designing sensors optimized for the platform and the analytical pipeline.
- Telecom/network provider: supplying and operating the private 6G infrastructure offshore, which is core to the real-time architecture.
- Knowledge body: co-developing inspection standards, so the system's outputs are accepted as regulatory-grade evidence.
- SME: acting as integrator for drones, sensors and other necessary software/hardware components. The SME can offer the inspection services including the drone to the wind farm operators and separately it will arrange with 5G/6G network operators for the network connection.
- Offshore wind operator: as launch partner providing asset access, operational requirements, and real-world validation.

Use case leader role: TNO will be the technical/knowledge partner bringing its knowledge on 5G/6G network, Digital Twin and analysis of sensor data to derive the blade health. TNO can act as the consultant for SMEs who will commercialize this solution. It is often possible for SMEs in the Netherlands to request funding from the government for working on innovative solutions in the green energy sector.

**Other commercialisation scenarios**

The solution could be applied to inspection of difficult to reach infrastructures (e.g. monument, high-rise buildings, bridges, etc.).

**Reference model**

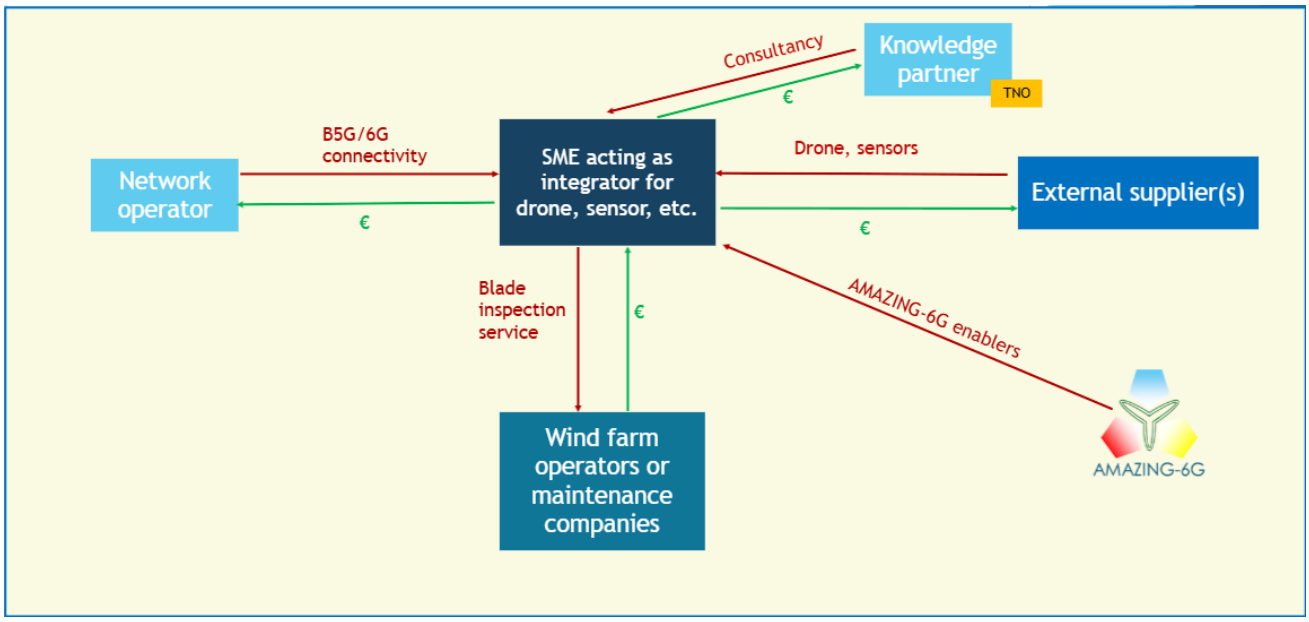


**Figure 19: E2 reference model**

### *5.2.1.10 E3 - Solar energy monitoring, control and predictions using B5G/6G communications and edge-cloud*

**Use case derived product/service**

A tool to control the production output of the PV solution, storage solution to optimize the energy consumption (for a prosumer) or to maximize the energy selling revenue (for an energy producer).

**Target customer**

Businesses which use their own PV production sites, and/or energy storage solutions. Businesses that own PV plants to produce and sell energy (below 4 MWp installed power).

**Customer needs/problems (addressed by the product/service)**

- Energy consumption efficiency.
- Energy production efficiency.
- Optimization of energy flows.

**Existing products/services currently addressing the same needs/problems**

The needs/problems above are currently addressed manually or even unaddressed.

**Advantage of the use case product/service compared to existing solutions**

- Predictive nature of the model.
- Efficiency.
- Autonomy.
- Pricing model: Energy Management as a Service EMaaS (no CapEx).

**Use case product/service pitch**

The combination of a device and an application that can control user's energy flows considering production, consumption, weather conditions, storage capacity, optimizing costs and revenues. All without initial CaPex.

**Actors and related roles required in the use case commercialisation scenario**

Actors and key flows are presented in Figure 20.

- Network Operator: responsible for providing a reliable network infrastructure.
- AI as a Service Provider: for providing solutions for forecasting energy production and consumption.
- Energy Supplier: for facilitating installations to their customers (energy suppliers would act as intermediary for the distribution of the solution).

Use case leader role: Csoft/Simtel would act as solution providers, and would also take care of sales and marketing activities. In addition, they would be involved also in post-sale functions: solution updates, maintenance, customer service and aggregation. The last is a potential further future development of the offering.

**Other commercialisation scenarios**

The solution can aggregate multiple location of the same customer or multiple customers in an association to optimize energy flows and costs.

**Reference model**

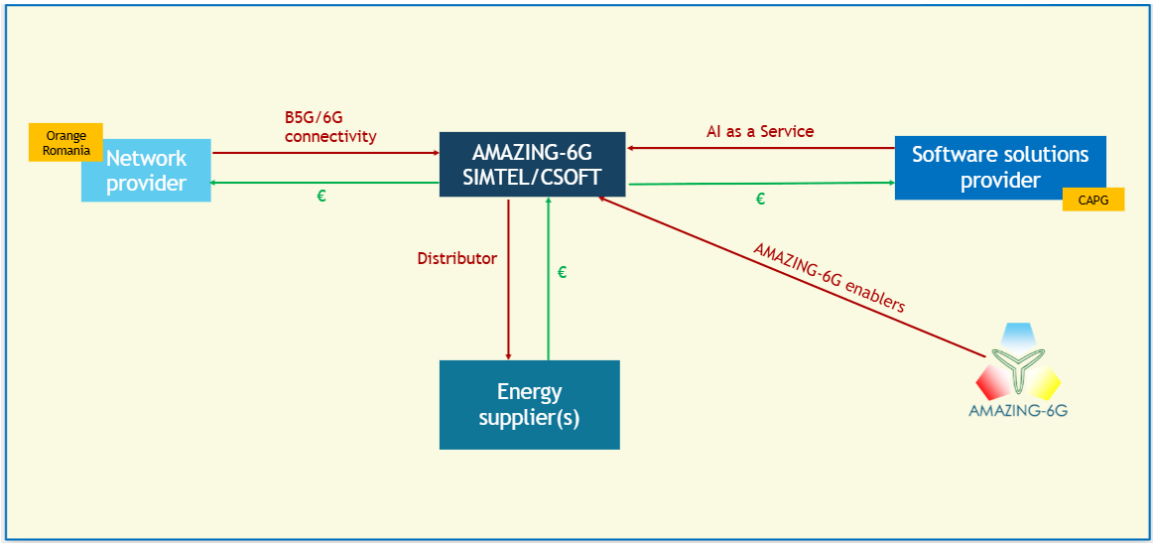


**Figure 20: E3 reference model**

### *5.2.1.11 T1 - Protection of Vulnerable Road Users*

**Use case derived product/service**

A solution for urban environments, based on battery-powered RSUs, that aims at increasing the safety of visually impaired individuals in risky areas. It combines RSUs, with data from other sources, including citizens smartphones, to create a digital twin of the area that incorporates and alerting system for VRUs.

**Target customer**

The main customers are city administrations/municipalities willing to increase visually impaired citizens safety when moving around the city. End-customers of the service are the VRUs who use the service for receiving assistance.

**Customer needs/problems (addressed by the product/service)**

- Increase safety for visually impaired individuals in urban areas without requiring substantial changes/interventions to road infrastructure.
- Increase visibility/monitoring capabilities in risky areas of urban environments.

**Existing products/services currently addressing the same needs/problems**

The needs are currently addressed by:

- Guide dogs
- Guidance systems such as marks on the street
- Audible signalling (including sounds close to traffic lights)
- Navigation and accessibility mobile applications

There is no solution for vehicles not making noise, like EVs or bikes.

**Advantage of the use case product/service compared to existing solutions**

- The system implementation does not require substantial changes to the road.
- Scalable to the entire urban environment or to the riskiest areas.
- Combination of data from multiple sources (RSU, OBUs, cameras and pedestrians' position via smartphones).
- Automatic and real-time alerting system.
- Exploitation of smartphones devices for alerting, thus it does not require pedestrians to acquire additional devices.
- Orchestration allows for energy saving since it allows allocation of processing capacity between RSUs (battery-powered) and edge server.

**Use case product/service pitch**

A sensor-equipped roadside unit that monitors a road intersection and collects data on vehicles and pedestrians, complemented by information shared by connected users and devices. The collected data is processed through a Digital Twin on an edge server to assess risk levels and provide real-time alerts to users via smartphones, enhancing safety in situations such as road crossing.

**Actors and related roles required in the use case commercialisation scenario**

Actors and key flows are presented in Figure 21.

- Network operator: for 6G network connectivity and QoS support.
- Orchestrator: for management of applications deployment and tasks migration.
- Hardware suppliers: for providing the hardware assets required in the service such as RSU, LiDAR, camera.
- Application provider: for developing the software applications used in the service.
- System integrator/distributor: for integration of hardware and software in the service realization.
- Municipality: for selecting policies to enhance safety in the monitored area.
- VRU association: for specifying their needs to ensure an effective service.

Use case leader role: LINKS can sell the IP of the RSU with camera and LiDAR, the data fusion methodology, the Digital Twin and the SW to analyse the risk level. Moreover, also the OBU and the SW for the UEs.

**Other commercialisation scenarios**

- Protection of VRUs in specific areas such as school and hospital zones.
- Protection of workers in building sites and industrial areas.

**Reference model**

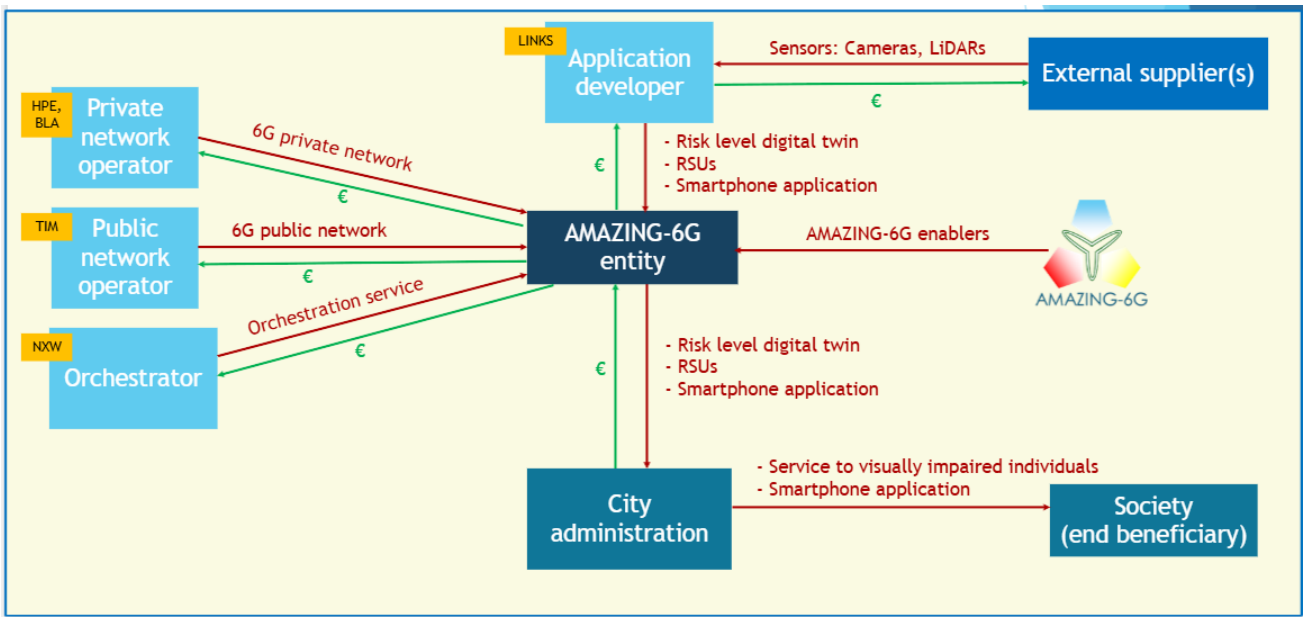


**Figure 21: T1 reference model**

### *5.2.1.12 T2 - Enhancing Urban Safety with AGV Monitoring*

**Use case derived product/service**

The service derived from T2 is an object-warning service for improving safety and accessibility of urban pedestrian areas. This service is devoted to monitor urban walkability and accessibility, especially for people with reduced mobility or visually impaired, using Autonomous Mobile Robots (AMRs). The service exploits information from sensors onboards the AMR (i.e., LiDAR, cameras) to identify obstacles and potential danger. The performance of B5G/6G networks can ensure to the service low latency to timely notification and high throughput to offload tasks from the AMR to the edge of the network, allowing to extend the AMR's operation time.

**Target customer**

The main customers are city administrations/municipalities willing to increase safety of VRUs when moving around the city. End-customers are also the VRUs who exploit the offered service.

**Customer needs/problems (addressed by the product/service)**

- Improved visibility for municipalities on public walkable spaces.
- Identifying recurring misuse of public space.
- Increasing citizens' safety, especially those with reduced mobility, in urban environments.
- Need to improve accessibility planning from the municipalities.
- Need to detect temporary and semi-permanent obstacles.

**Existing products/services currently addressing the same needs/problems**

- Services to collect citizens' signalling of issues in walkable areas.
- Fixed cameras installed in urban environments.
- Manual inspection performed by municipalities staff.

**Advantage of the use case product/service compared to existing solutions**

- Identifying semi-permanent obstacles using AMR as vectors (turning delivery fleets into vectors for data collection).

- Continuous and periodic monitoring of obstacles.
- Detection of obstacles and of generic accessibility issues in the monitored area.
- Real-time warnings to VRUs.

**Use case product/service pitch**

A real-time obstacle warning service exploiting B5G/6G network features to offer a scalable and sustainable service to VRUs. Exploiting already available fleet of AMRs, this service takes advantage of their sensor data for a continuous monitoring of urban areas.

**Actors and related roles required in the use case commercialisation scenario**

Actors and key flows are presented in Figure 22.

- Network operator: for 6G network connectivity and QoS support.
- Orchestrator: for management of applications deployment and tasks migration.
- External suppliers: for providing the hardware assets required in the service such as the AMR hardware and its sensors (e.g., camera, LiDAR)
- AMR fleets manager: for planning the AMRs and monitoring their operations.
- System integrator/distributor: for integration of hardware and software in the service realization.
- Application provider: for developing the software applications used in the service.
- Municipality: for taking the proper countermeasures based on the long-term data collection.

Use case leader role: LINKS can take the role of service solution integration, by identifying the most appropriate partners for the implementation, and management of the service. LINKS could be the point of contact between the municipality and the solution providers.

**Other commercialisation scenarios**

- Monitoring of parking compliance of shared mobility vehicles, such as bicycles and e-scooters.
- Monitoring of indoor public areas such as hospitals, airports, railway stations.
- Monitoring of pavements conditions.

**Reference model**

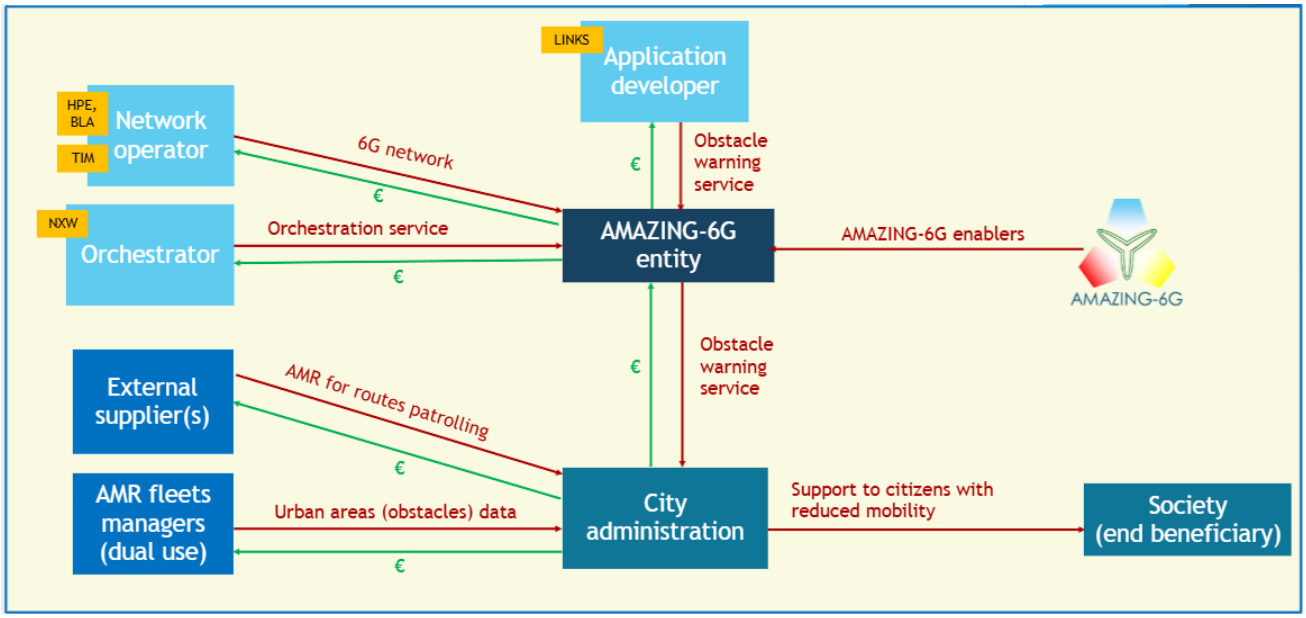


**Figure 22: T2 reference model**

### *5.2.1.13 T3 - Wireless signalling on rail tracks*

**Use case derived product/service**

Railway ISAC (Information Sharing and Analysis Center) Monitoring and Resilient Signalling Support Platform.

**Target customer**

- Railway operators.
- Railway infrastructure managers.
- Signalling and rail system integrators.
- Telecom operators / FRMCS connectivity providers.
- Rail vehicle manufacturers (OEMs) and onboard communications suppliers.

**Customer needs/problems (addressed by the product/service)**

- Need for more resilient railway operations with less service disruption (network coverage).
- Need for earlier detection of obstacles, anomalies, and train integrity issues; efficient obstacle detection by train or infrastructure.
- Need for reliable low-latency communication for operational railway data.
- Need to reduce maintenance effort and restoration costs.
- Need to modernise railway communications without replacing everything at once.
- Need to different network configurations in one testbed.
- Need to harsh environment for mobile communication.
- Need for lower parts costs through different technology.

**Existing products/services currently addressing the same needs/problems**

- Today, those needs are mostly addressed through a combination of conventional signalling, railway-dedicated radio, trackside detection systems, and digital maintenance platforms, rather than through a single integrated 5G/6G sensing-and-communications service. Different and redundant technologies under development for object detection and signalling.
- Currently supervision runs mostly through the driver's field of view. Any loss of communication network is not accepted by the customer.

**Advantage of the use case product/service compared to existing solutions**

The provision of one integrated layer for communication, sensing, and operational support, whereas current rail systems usually treat these as separate domains:

- signalling through ERTMS/ETCS and interlockings
- radio communications through GSM-R today and FRMCS tomorrow,
- obstacle detection through dedicated onboard/trackside sensors
- maintenance through separate monitoring platforms.

The benefit associated to an integrated layer is that it summarizes measurement, communication and detection methods under / inside one technology, so railway manufactures, operators and infrastructure companies may reduce costs for different kind of components / technologies.

**Use case product/service pitch**

A flexible 5G/6G-enabled railway platform combining communication and sensing to enhance operational awareness and resilience. It enables real-time monitoring, obstacle detection, and robust and resilient train-to-ground/train-to-train data exchange while addressing coverage gaps using a configurable mobile network and railway expertise.

**Actors and related roles required in the use case commercialisation scenario**

Actors and key flows are presented in Figure 23.

- MNO: responsible for mobile network infrastructure that includes the core network and the RAN. It provides the network connectivity to the vehicles.

- Railway operator: main end customer and deployment partner.
- Railway infrastructure manager: interaction with trackside assets and operational railway infrastructure, especially where LCX cables, access points, and signalling-related integration are required.
- Onboard systems supplier: integrate the train subsystem, onboard communication modules, sensing interfaces, and train integrity/monitoring functions.
- Trackside infrastructure supplier: provide LCX cables, and associated railway trackside equipment.
- 5G/6G RAN supplier: provide RAN elements and support the railway-specific deployment.
- 5G core provider: provide the core network, session management, mobility management, and slicing support used for real-time train coordination and operational services.
- ISAC / sensing software provider: provide the sensing-processing layer, obstacle detection logic, etc.
- Edge/cloud platform provider: host the ISAC microservice, real-time fusion logic, monitoring dashboards, data storage, and APIs toward railway management systems.
- Orchestrator: integrate railway systems, network components, sensing functions, APIs, and operational workflows into one deployable service.

Use case leader role: TUC can provide the algorithms, which are developed and validated by Serial software developers using production-grade tools. SRCC serves as a test bed during production development as part of the qualification process.

**Other commercialisation scenarios**

- Metro and urban rail systems
- Tram and light rail networks
- Freight terminals, ports, and industrial rail yards
- Mining and private industrial railways
- Road tunnel or linear critical infrastructure monitoring

**Reference model**

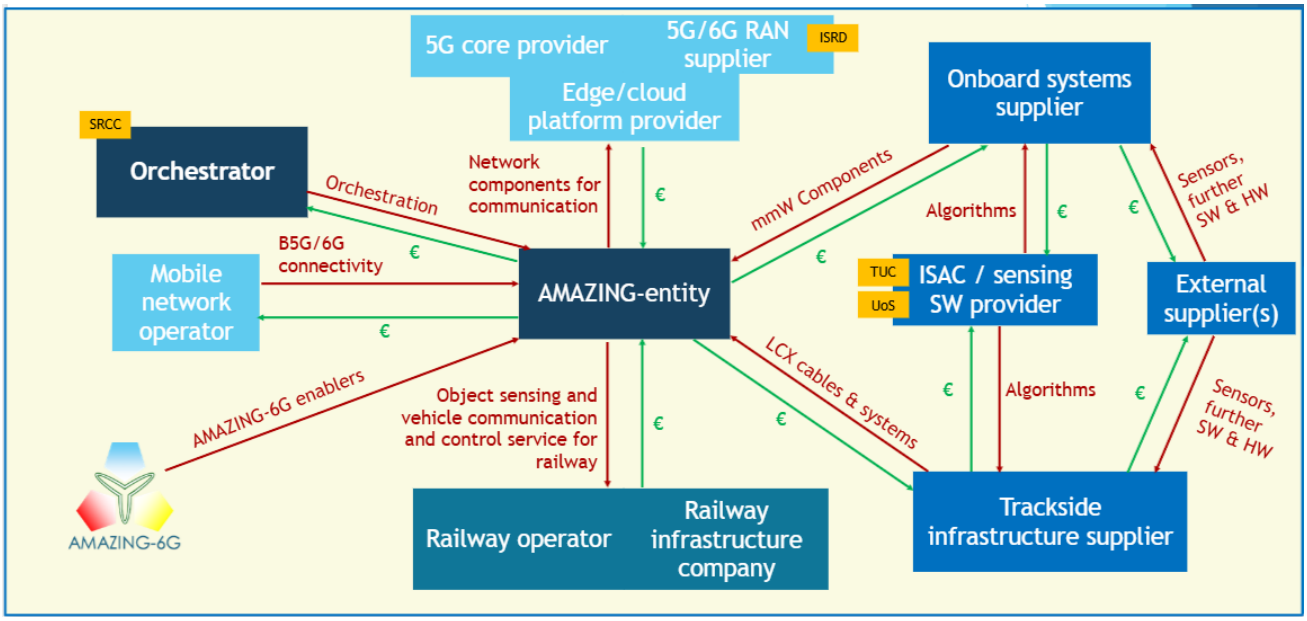


**Figure 23: T3 reference model**

### *5.2.1.14 T4 - Teleoperation as a backup to autonomous driving*

**Use case derived product/service**

A tele-operation and remote-assistance platform for autonomous and highly automated vehicles.

**Target customer**

Organizations that either operate vehicles or provide the digital driving stack.

**Customer needs/problems (addressed by the product/service)**

- Safe handling of edge cases in autonomous driving.
- Reliable low-latency remote supervision and intervention.
- Seamless integration with connectivity and edge infrastructure.

**Existing products/services currently addressing the same needs/problems**

Today, those needs are usually addressed through a combination of human supervision, constrained deployment, and partial remote support, rather than through a fully integrated tele-operation platform like T4.

**Advantage of the use case product/service compared to existing solutions**

- It enables intervention without needing a safety driver on board.
- Proactive, not reactive.
- Combines tele-operation with B5G/6G connectivity orchestration.
- Improves service continuity and vehicle uptime.

**Use case product/service pitch**

A B5G/6G-enabled remote supervision and tele-operation platform for automated vehicles that acts on top of the autonomous driving stack. It continuously monitors vehicle status and connectivity, detects edge cases, and enables secure low-latency remote intervention to maintain safe and continuous operations.

**Actors and related roles required in the use case commercialisation scenario**

Actors and key flows are presented in Figure 24.

- Vehicle/Vehicle platform provider: integrate the tele-operation and supervision layer with the vehicle.
- On-board hardware suppliers: provide hardware needed for perception, localisation, and remote-control support.
- Remote operation software supplier: provide the remote operator workstation, visualisation dashboard, control interface, etc.
- Decision making software provider: software to provide decision-support functions.
- Edge/cloud infrastructure provider: to host the platform components that manage video streaming, telemetry aggregation, event processing, and data logging.
- MNO: provide the B5G/6G connectivity, QoS assurance, network slicing, and wide-area service coverage.
- MEC provider: provide low-latency deployment of selected application functions close to the vehicle and control centre.
- V2X infrastructure provider: provide contextual awareness through roadside units, cooperative messages, traffic signal integration, and smart infrastructure interfaces.
- Orchestrator: provide service orchestration, lifecycle management, interoperability across vehicle, network, and edge/cloud domains, and overall system integration.

Use case leader role: TUC would not act as direct distributor of the solution, however it would be involved in:

- Vehicle/Vehicle platform provider
- Remote operation software supplier
- Decision making software provider

**Other commercialisation scenarios**

Scenarios where vehicles or mobile assets operate autonomously but still require safe remote supervision and intervention (buses, shuttles, trucks, etc).

**Reference model**

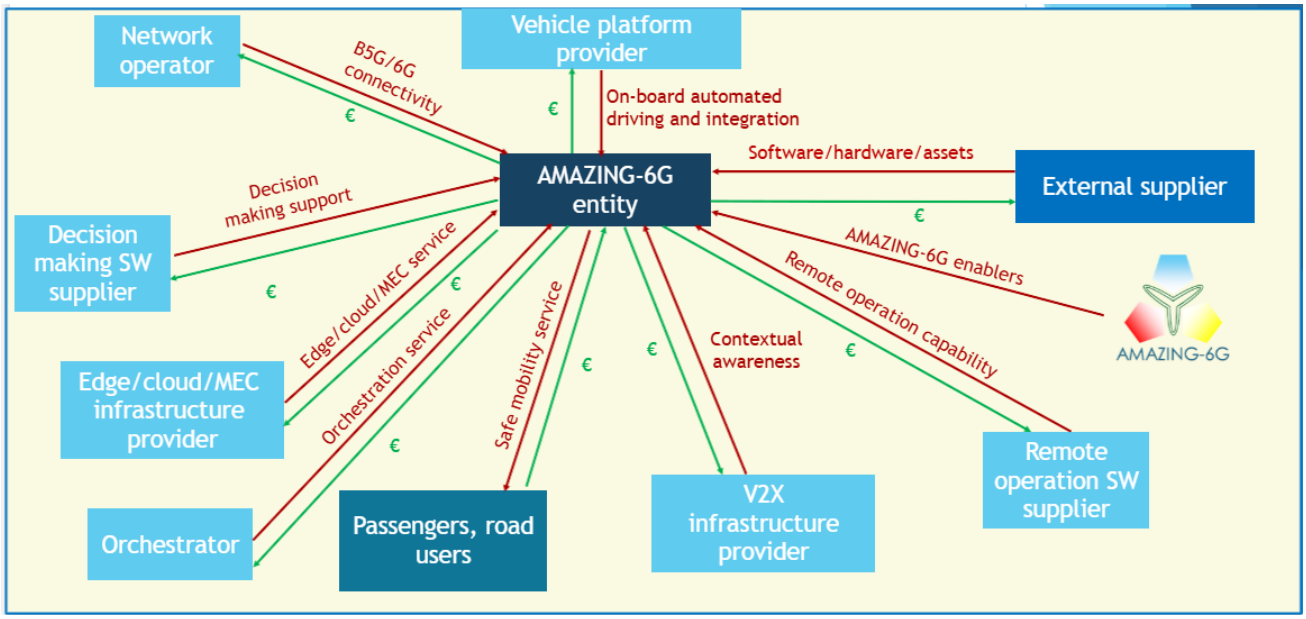


**Figure 24: T4 reference model**

### *5.2.1.15 T5 - Port logistics and transport operations optimization and safety*

**Use case derived product/service**

The UC will produce a service for:

- ensuring the continuity of port operations during communications disruptions
- optimising operational efficiency, safety and sustainability of operations through a digital platform (DT).

The hardware foundation enabling both capabilities is the Acromove ServerPack™ Edge Ultra in the "5G & AI" configuration (SKU: SPEU-5GAI-X532DL-SSUP-LCLC-128). This is a portable, ruggedized edge cloud appliance that combines datacenter-class compute (5th Gen Intel Xeon 6538N, 32 cores), an NVIDIA L4 GPU for AI inference (485 TOPS INT8), 128 GB DDR5 ECC RAM, and integrated Private 5G connectivity (Intel quad E810 NIC with PTP, RJ45 + LC fiber interfaces) in a single deployable unit weighing less than 23 kg. It hosts the Private 5G core software stack, small cell radio management, and the edge AI workloads required by the Digital Twin, all within an integrated UPS-backed system that can be deployed in under 15 minutes.

**Target customer**

Mainly port authorities and terminal operators. Additionally, the SPE Ultra 5G & AI variant targets customers in transportation and sectors requiring edge AI inference combined with Private 5G connectivity in demanding/challenging environments.

**Customer needs/problems (addressed by the product/service)**

- Resilience of operations from the data availability (data transfer) point of view through better communication capabilities.
- Improved energy management (environmental sustainability) through increased operational efficiency.

- Increased safety for employees through reduced human–machine interaction.
- Improved connectivity for demanding/challenging environments, like ports are.

The SPE Ultra 5G & AI variant specifically addresses:

- Communication resilience: the integrated Private 5G core and small cells (gNodeB, bands N48/N77/N78) provide a standalone backup network independent of public MNO infrastructure, supporting up to 100 users and 50 SIM cards.
- High-performance edge AI compute: the NVIDIA L4 GPU enables on-site AI inference for safety monitoring (worker position detection, safety compliance) and Digital Twin computations without depending on cloud connectivity.
- Portability and rapid deployment: the system deploys in under 15 minutes, weighs <23 kg, and includes an integrated UPS providing 1–2 hours of autonomy, ensuring operations continue even during power disruptions.

**Existing products/services currently addressing the same needs/problems**

The resilience of operations from the communications network point of view is addressed today only through preventive maintenance of communication infrastructure of the port, while the operational efficiency is ensured from commercial digital products aiming to optimize internal operations following specific methodologies but without the operational awareness created from the capabilities of a digital twin. Finally, the safety of employees is achieved through strict safety protocols implemented which however do not reduce the interaction between humans and machines.

Existing edge computing solutions such as the Oracle Roving Edge Device (RED) and the HPE edge solution are direct competitors. However, these solutions do not offer integrated Private 5G in a single portable appliance. Oracle RED, for instance, is a general-purpose edge device that requires separate networking infrastructure and cannot host a 5G core natively. The SPE Ultra is purpose-built from the ground up as an edge cloud appliance rather than being a modified rack server, featuring a proprietary aircraft-aluminium chassis with crash-proof and waterproof exoskeleton, anti-shock design with floating internal components, and operating temperature range of –20°C to 55°C – none of which are available in competing products. The NVIDIA L4 GPU running on the SPE Ultra 5G & AI variant provides the 485 TOPS (INT8) inference performance needed to run these AI safety-monitoring models locally at the edge, with minimal latency, while the Private 5G network provides the reliable, low-latency wireless connectivity required for real-time teleoperation of port equipment (STS cranes, straddle carriers).

The Digital Twin is estimating the impact on efficiency of the B5G/6G-enabled teleoperation of port equipment (STS & straddle carriers), providing visibility of bottlenecks created from the changes (increase) in productivity of the affected processes (e.g. unloading from ships) and supporting the optimisation of the entire chain of operations to better utilize the gains from these changes (e.g. teleoperation of STSs). The SPE Ultra 5G & AI appliance hosts the Digital Twin software locally, feeding it real-time data from IoT sensors via the Private 5G network. The system's storage capacity (1 TB boot + 6× SSD) ensures historical data retention for trend analysis, while the 128 GB DDR5 ECC RAM (expandable to 2 TB) supports large-scale simulation workloads. This all-in-one edge infrastructure eliminates the latency and dependency on cloud connectivity that would otherwise limit real-time Digital Twin responsiveness.

**Advantage of the use case product/service compared to existing solutions**

- Increased operational resilience/reliability (back-up system for communications).
- Higher operational efficiency through better optimization.
- Increased safety through lower interaction points between human and machines. Human-machine interaction is both reduced (through the pathway towards teleoperation of Ship-to-Shore cranes and Straddle carriers) and better monitored (IoT sensors and AI application for identifying the implementation of safety measures and also the position/movement of workers near the machines).

Specific advantages of the SPE Ultra 5G & AI variant over existing solutions include:

- Single-box integration: compute, AI GPU, Private 5G core, small cell management, UPS, and router all in one portable appliance – competitors require multiple separate boxes.
- Ruggedisation: aircraft-aluminium chassis, crash-proof/waterproof exoskeleton, –20°C to 55°C operating range, <23 kg weight.
- Deployment speed: operational in <15 minutes.
- Flexible commercial model: available for purchase ($49,800 base + $5,900 NVIDIA L4 + optional 5G kit) or lease ($5,000/month minimum 4 months).
- Integrated UPS: hot-swappable Li-Ion batteries providing 1–2 hours autonomy.
- Security: TPM 2.0, on premise data processing with no cloud dependency.
- Versatile connectivity: Intel E810 quad 25GbE NIC with PTP, RJ45 + LC fibre, Wi-Fi 5 with dual-band MU-MIMO, integrated cellular router with 2 SIM slots and auto-switch, supporting VPN profiles including WireGuard, IPsec, OpenVPN, and more.

**Use case product/service pitch**

A service leveraging B5G/6G networks to ensure resilient port operations under communication disruptions while utilising a Digital Twin platform to enhance efficiency, safety, and environmental sustainability. Powered by the Acromove ServerPack™ Edge Ultra (5G & AI), the solution delivers a fully integrated portable edge cloud and Private 5G platform, combining a 5th Gen Intel Xeon processor, NVIDIA L4 GPU, and standalone 5G core in a single ruggedised appliance weighing under 23 kg, enabling real-time AI inference, Digital Twin operations, and resilient private wireless connectivity at the port edge, deployable in under 15 minutes.

**Actors and related roles required in the use case commercialisation scenario**

Actors and key flows are presented in Figure 25.

- IoT Connectivity and Infrastructure Provider: Supplies the IoT sensors (environmental, positional, safety) and gateways that feed real-time data into the Digital Twin via the Private 5G network. Critical for the data layer that underpins AI inference and operational optimisation.
- 5G Small Cell Radio Supplier: Provides enterprise/private 5G small cell radios (gNodeB) for indoor and outdoor deployment. These cells cover the required bands and provide the radio access layer for the standalone Private 5G network hosted on the SPE Ultra.
- System Integrator / Deployment Partner: Handles on-site deployment, commissioning, integration testing, and operator training. Acts as a local presence for customers who require hands-on support during rollout. Also responsible for post-sale customer support, maintenance, and solution upgrades.

Use case leader role:

- Acromove Inc. (Network Hardware Supplier & Operator): Responsible for the design, manufacture, and supply of the SPE Ultra 5G & AI edge cloud appliance. Provides the integrated Private 5G core software stack, the P5G deployment orchestrator, small cell radio integration, SIM card provisioning, and the networking modification for high-performance NICs. Acromove commercialises its hardware directly to end customers (ports, terminal operators) and through channel partners and system integrators. For certain regions, Acromove may also work with local distributors or enterprise resellers. It would offer both outright purchase and leasing models. The Digital Twin is a system that will require regular maintenance and update regarding the port status, info sources etc. Also, it has the capability to be further extended or adapted to respond to different future needs. From this point of view, the solution provider/developer (CERTH/HIT) would be involved after the purchase of the product. However, the customer can be using the solution on its own for taking the output it needs after the initial setup and delivery from the solution developer (after training).
- CERTH/HIT (Digital Twin Software Provider): Technical partner and solution provider responsible for the setup, deployment, operation, and maintenance of the port Digital Twin. Connects all necessary

data sources from the IoT layer and the 5G network to the DT platform and operates it to provide actionable output to the customer (port authorities/terminal operators). Involved post-sale for regular maintenance, updates, and future extensions. Acromove will also be involved post-sale in hardware support (UPS battery replacements, component upgrades), Private 5G core software updates, and potential scaling (adding small cells for extended coverage, RAM/storage upgrades).

**Other commercialisation scenarios**

The continuity of operations through reliable communications networks as well as the optimization of operations through a digital twin, are general concepts that can be also implemented in other similar processes in the transport sector (e.g. rail systems, or inland terminals) but also in other sectors. The SPE Ultra 5G & AI variant is explicitly designed for cross-sector applicability. Current and target verticals include:

- Transportation: port operations, rail systems, inland terminals.
- PPDR (Public Protection and Disaster Relief) deployments with portable 4G/LTE/5G coverage.
- Emergency response: rapidly deployable communications and compute infrastructure for disaster scenarios.
- Construction & field operations: temporary Private 5G coverage with edge compute for site management and safety monitoring.

**Reference model**

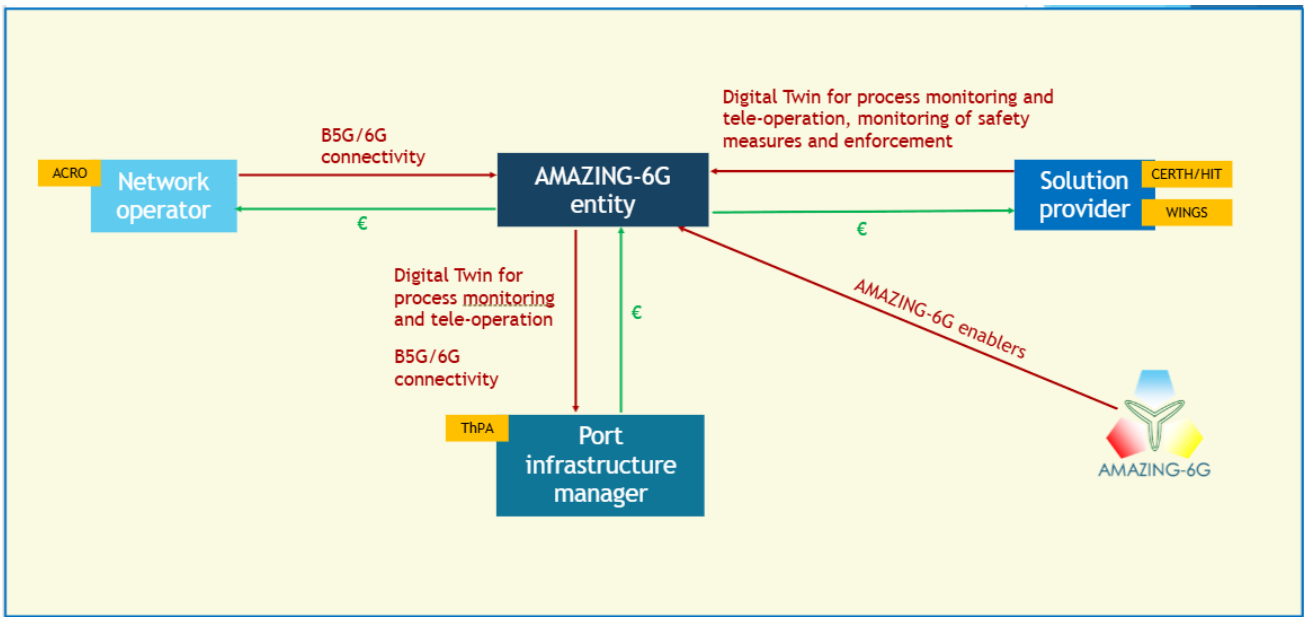


**Figure 25: T5 reference model**

## 5.3 Liaison and Cooperation

Task T8.3 also addresses liaison and cooperation activities, with a particular focus on establishing synergies and fostering collaboration with related initiatives and projects. In this context, the task includes liaising with SNS-JU initiatives. SNS-JU. Table 7 summarises the main liaison and cooperation activities conducted so far within the AMAZING-6G project.

**Table 7: Summary of liaison and cooperation activities for AMAZING-6G project**

| No. | Name of organisation, initiative, etc. holding the activity | WP | Activity format and timing | Topic(s) of activity | Description of activity | Results/outcomes/achievements |
|---|---|---|---|---|---|---|
| 1 | TIM – TrialsNet (Horizon Project - GA n. 101095871) | WP7 | Presentation during AMAZING-6G plenary meeting in Antwerp<br>(11/04/2025 | KPIs, KVIs | The presentation has been about "TrialsNet approach to trials' results assessment" since it is a relevant topic for AMAZING-6G project as well. The relevance of TrialsNet refers to the fact that both projects deal with smart networks beyond 5G. | N/A |
| 2 | UC3M participation in the SNSJU Communication and Dissemination Task Force | WP8 | Monthly online meetings | Communication and dissemination | Monthly meetings with representatives of other SNSJU projects to coordinate, decide on joint actions, share achievements, results, and methodologies. | Social media followers, result viewers, joint video at EuCNC26, joint participation at MWC27, etc. |
| 3 | WINGS participation in SNS Steering Board | WP1 | 2 physical meetings and 2 online meetings | Project management aspects | Meetings with coordinators of other SNSJU projects to coordinate, decide on joint actions, share achievements, results, and methodologies. | Alignment of best practices with other SNS JU projects. |
| 4 | WINGS and IMEC participation in SNS TMV Working Group | WP7 | Monthly meetings online | Trials' results assessment, KPIs, KVIs | Monthly meetings with representatives of other SNSJU projects to discuss aspects on KPIs/KVIs | Contributions to SNS White Paper on KPIs and White Paper on KVIs. |
| 5 | WINGS and IMEC participation in 6G-IA Trials Working Group | WP7 | Every 3 months online meetings | Trials' results assessment, KPIs, KVIs | Meetings with Trials representatives to discuss aspects of trials | Presentation of AMAZING-6G Trials overview and contribution to White Paper: Technical Insights from Large-Scale Trials under SNS projects. |
| 6 | TID participation in 6G-IA Pre-Standards Working Group | WP8 | Online meetings | Standardisation | Meetings with other project representatives to discuss aspects of pre-standardization activity | N/A |

| | | | | | | |
|---|---|---|---|---|---|---|
| 7 | TNO participation in 6G-IA Vision Working Group | WP8 | Online meetings | | Meetings with other project representatives to discuss aspects of 6G and future networks vision | N/A |
| 8 | UoS participation in the SNS-JU Architecture group | WP2 | Bi-weekly online meetings | 6G Architecture | Meetings with other project representatives. Project presentations and discussions about dissemination (participation to workshops and conferences, e.g., ICC'26 & EUCNC'26). A series of white papers has been discussed recently, targeting publication second semester 2026. | Presentation of the AMAZING-6G Architecture v1 (October 27th, 2025) IMEC, TUC, VTT and TNO will be involved in a total of 5 among 10 topics initially proposed (some topic splits are ongoing). |
| 9 | LINKS participation in 6G-IA 5G/6G for CAM Working Group | WP6 | Bi-weekly online meetings | Transport use cases | Meetings with other project representatives to discuss aspects of 6G for CAM. | N/A |
| 10 | WINGS, VTT, PNET participation in SNS Sustainability Working Group | WP8 | Bi-weekly online meetings | Sustainability aspects of use cases | Meetings with other project representatives to discuss aspects of sustainability and how sustainability is taken into consideration in the projects. | Presentation of AMAZING-6G Sustainability approach in Oct.2025 and contribution to relevant material. |
| 11 | VTT participation in SNS Technical Board | WP1 | Monthly online meetings | Technical management aspects | Meetings with technical managers of other SNSJU projects to coordinate, decide on joint actions, share achievements, results, and methodologies. | Alignment of best practices with other SNS JU projects. |

In addition, LINKS was supposed to participate to the ITS European Congress (April 27–29, 2026) in Turkey. LINKS would have presented AMAZING-6G in a discussion session with other projects. However, due to the disruptions caused by the geopolitical situation in the area, participation was not possible.

## 5.4 Summary and Next Steps

In the coming months, exploitation activities will focus on two parallel activities: further developing the work on AMAZING-6G KERs and on use cases.

In the context of KERs, the current project results list available (presented in D8.1), will be firstly updated to make sure to include any new relevant entry and eventually modify existing ones. Once the list of results is reviewed, each responsible partner will be required to provide additional input to enrich the amount of information available. Those entries that are indicated by partners as KERs will be individually assessed to select those with a concrete commercialisation potential. For those KERs with a commercialisation potential, a business model will be developed in collaboration with the responsible partner. This step ensures that a plan is available for the result further development beyond AMAZING-6G project duration. Once again, as for background and foreground information, ad hoc excel files will be made available by LINKS, with a sheet dedicated to each partner.

In the context of use cases, the information contained in this deliverable (D8.2) will be further developed. Once again, workshop sessions will be organized and held by LINKS to collect additional details on uses cases commercial exploitation potential. The expected final results will be completed business model canvas.

Further liaison and cooperation activities will be implemented in the coming months.

# 6 Conclusions

This deliverable has presented the communication, dissemination, standardization, and exploitation activities carried out within the AMAZING-6G project during the first half of the project lifecycle. The reported activities demonstrate the consortium's continuous effort to maximize the visibility, impact, and long-term sustainability of the project outcomes across scientific, industrial, regulatory, and societal domains.

Significant progress has been achieved in communication and dissemination activities. The project established and consolidated its online presence through the project website, social media channels, newsletters, and multimedia content, while also ensuring active participation in scientific conferences, industrial events, workshops, and collaborative SNS initiatives. These activities contributed to increasing the visibility of the project among multiple stakeholder communities, including researchers, industry representatives, policymakers, and the general public. The monitoring of dedicated KPIs has provided quantitative evidence of the effectiveness of these actions and enabled the consortium to identify areas where additional efforts are required to further strengthen outreach and engagement activities during the next phases of the project.

The deliverable also highlighted the progress achieved in standardization activities. Consortium partners have actively contributed to relevant international standardization bodies and industrial initiatives, including activities related to 3GPP and GSMA. These contributions represent an important step toward aligning the technological developments of AMAZING-6G with emerging B5G/6G standards and ensuring that the project outcomes can effectively support future interoperable and scalable communication ecosystems.

In parallel, important work has been performed in the area of exploitation and IPR management. The analysis of background assets provided a clearer understanding of the technologies, expertise, software, hardware, and datasets available within the consortium, together with their potential usability beyond the project context. Furthermore, the project initiated the assessment of commercialization opportunities associated with the project use cases, leading to the definition of preliminary exploitation scenarios across the targeted vertical domains, including eHealth, public safety, energy, and transport. These activities constitute a first step toward identifying sustainable business opportunities and maximizing the long-term impact of the project results.

The activities presented in this deliverable also confirm the multidisciplinary nature of AMAZING-6G and the strong collaboration established among consortium partners from academia, research organizations, industry, and vertical sectors. This collaborative approach is essential to ensure that the technological innovations developed within the project effectively address real-world challenges and respond to the needs of future B5G/6G ecosystems.

Looking ahead, the consortium will continue to strengthen its communication and dissemination actions, increase participation in high-impact scientific and industrial events, reinforce collaboration with SNS initiatives and standardization bodies, and further refine the exploitation strategies associated with the project outcomes and Key Exploitable Results (KERs). Additional efforts will also be dedicated to monitoring KPI evolution and adapting the planned activities whenever necessary to ensure alignment with the project objectives and expected impact.

Overall, the progress reported in this deliverable demonstrates that AMAZING-6G has established a solid foundation for ensuring broad visibility, effective stakeholder engagement, technological relevance, and long-term exploitation potential for the innovations developed within the project. The continuation and expansion of these activities during the second half of the project will be instrumental in maximizing the scientific, industrial, and societal impact of AMAZING-6G beyond the project lifetime.

# Appendix – Brainstorming Template for Use Case Exploitation

**AMAZING-6G – BUSINESS MODELLING ACTIVITY**

**USE CASE:**

**ORGANIZATION FILLING UP THE SHEET:** your organization acronym

**1. Imagine your organisation asks you to create a product or a service from this use case, what is it and what does it do?**

Your answer..

**2. So, in a commercialisation perspective (use your imagination), who would it be your customer(s)?**

Your answer..

**3. What kind of "needs" (of your potential customer) your product/service would address/solve? (please, try to list at least three "needs" of your potential customer)**

*For example: better communication capabilities, improved power management, improved computational capacity, etc.*

Your answer..

**4. How such needs are currently addressed/solved by existing products/services or technologies?**

*For example: currently these needs are addressed by product/service X that provides these benefits/performance/capabilities, but it does not provide...*

Your answer..

**5. What kind of advantage your product/service has compared to the existing solutions above?**

*For example: higher efficiency, lower operating costs, improved reliability...*

Your answer..

**6. How would you describe your product/service in 3-4 lines, maximum two sentences?**

Your answer..

**7. What organisations, apart from your own, do you imagine being necessary for the full development and commercialisation of the product/service?**

*For example:*

- *Supplier of hardware x*
- *Supplier of software x*
- *Supplier of service x*
- *Network operator*
- *Orchestrator*

Your answer..

**8. Please, briefly describe the role and the importance of each of the organisations you mentioned before in the commercialisation scenario.**

*For example:*

- *Network Operator: The network operator is responsible for mobile network infrastructure that includes the core network and the RAN. It provides the network connectivity to the vehicles.*

Your answer..

**9. Which role your organisation may have in this commercialisation scenario? Who it be the entity commercialising the product/service to the customer you indicated earlier?**

*For example: would your organisation be a technical partner, the solution provider, etc.*

Your answer..

**10. Do you imagine an intermediary or distributor to commercialize the product/service to the customer (identified earlier) or your organization will do it directly?**

Your answer..

**11. Do you think your organisation will be involved also after someone purchased the product/service?**

*For example: for updates, maintenance, customer service, etc.*

Your answer..

**12. Can you imagine the product being adopted also in different scenarios than the one initially thought?**

*For example: other sectors, other organisations in the same or in a close sector, etc.*

Your answer..