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Plan for exploitation towards Vertical stakeholders

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Abstract

This deliverable has been created as part of the work in the project Work Package (WP) 6 "Promotion" and details the foreseen plan for exploitation of project results toward vertical stakeholders. The discussion concerns the activities being planned to set-up user groups from vertical markets, and the organization of training workshops mainly targeting transport, public safety, and rural communities.

Keywords

dissemination, exploitation, user groups, workshops, vertical markets

Executive Summary

This deliverable corresponds to the first of a total of three deliverables, concerning the exploitation activities of the 5G-ALLSTAR project within the scope of WP6 focusing on promotion. In this first document, we lay down the planned activities that both each partner and the consortium will undergo.

More specifically, it details the exploitable knowledge for each partner involved in the task, and the individual exploitation plan. While the individual exploitation plans for 5G-ALLSTAR partner have been developed by each party based on its current vision and strategy, some of the exploitable opportunities may stem among project partners during and after the project. Some partners have detailed the exploitable knowledge they have developed so far in the project, and the anticipated opportunities for exploitation.

Finally, in the document we present the planned activities for fostering users and stakeholders' involvement in the exploitation of 5G-ALLSTAR results.

The reports that will follow in Y2 (M24) and Y3 (M36) will present the activities effectively performed in the relative period.

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List of Abbreviations

3GPP	3rd Generation Partnership Project	**MIST**	Korea's Ministry of Science and ICT
4G	4th Generation mobile network	**mmWave**	Millimeter wave
5G	5th Generation mobile network	**MN**	Moving Network
B2B	Business-to-Business transaction type	**MNO**	Mobile Network Operators
B2C	Business-to-Consumer transaction type	**PoC**	Proof of Concept
CAN	Controller Area Network	**R&D**	Research & Development
EPC	Evolved Packet Core	**RAN**	Radio Access Network
GEO	Geostationary Earth Orbit	**RAT**	Radio Access Technology
HAPS	High Altitude Platforms	**SA(n)**	3GPP's Service and System Aspect meeting
IP	Intellectual Property	**SME**	Small and Medium Enterprise
IPR	Intellectual Property (Rights)	**SNO**	Satellite Network Operators
KPI	Key Performance Indicator	**V2X**	Vehicle to Everything
LEO	Low Earth Orbit	**WAVE**	Wireless Access in Vehicular Environments
MEC	Multi-access Edge Computing	**WN**	Wireless Communication and Network

1   Introduction

The results already obtained within the context of 5G-ALLSTAR and the expected results of the project suggest a viable exploitation of the results for commercial use.

To maximize the impact of project's results, we layout a plan for exploitation targeting vertical stakeholders in the transport, public safety markets, and rural communities. The objective is to both inform key stakeholders of the results obtained, and promote multi-connectivity integrating terrestrial and satellite channels.

Among these activities, two complementary actions are identified to foster project's innovations awareness, and future diffusion:

1. The development of potential user and key stakeholder groups in the identified verticals;

2. The organization of training workshops where the opportunity of satellite 5G and multi-connectivity are presented.

Both activities represent relevant venues for gathering feedbacks on the business models and, indirectly, on the possible technological acceptance and barriers in the vertical markets.

To assure a successful outcome, these activities are expected to be performed by project partners, both in Europe and Korea.

In the following sections we will define these activities, how we plan to perform them, the expected outcomes, the risks assessment and the mitigation plan.

1.1   Scope of 5G-ALLSTAR

The 5G ALL-STAR project kicked-off in July 2018 with a 36 months duration, with the aim to design, develop, evaluate and trial multi-connectivity based on multiple access, combining cellular and satellite access technologies to support seamless reliable and ubiquitous broadband services.

To this end, 5G ALL-STAR will develop selected technologies targeting a set of PoCs to validate and demonstrate in heterogeneous real setup:

1. 5G cellular mmWave access system for providing broadband and low latency 5G services;

2. new radio-based feasibility of satellite access for providing broadband and reliable 5G services;

3. multi-connectivity support based on cellular and satellite access;

4. spectrum sharing between cellular and satellite access.

In addition, the project will actively contribute to global 5G standardization including 3GPP and ETSI focusing on multi-RAT interoperability and New Radio based satellite access, and the creation of a cross-regional lasting synergy for 5G research, innovation and commercialization through value proposition assessment for vertical industries.

1.2 Context of this document

The deliverable document corresponds to the first of a series of three documents planning and then reporting the activities for fostering project's results exploitation for vertical markets.

This document is a deliverable within WP6, Task 6.3 "Business models and focus exploitation for vertical markets". The objectives of Task 6.3 can be summarized as follows:

1. Refine the business models/cases for the proposed 5G ALL-STAR multiple access concept, initially developed within Task 2.4, and summarized in D2.4, along project's journey.

2. Set-up user groups from the targeted verticals in the area of transport (e.g. public safety sector, Railway Transportation sector which are actually both active in 3GPP), public safety and rural communities.

3. Organize of training workshops with representatives from the targeted verticals on the 5G ALL-STAR defined solutions and developed technologies to collect feedback on the relevance of the business models and KPIs achieved.

The present deliverable document D6.9 defines the plan for 5G-ALLSTAR project results exploitation toward the targeted vertical markets.

2 Planned activities

2.1 Exploitable results

The following table reports the main exploitable 5G-ALLSTAR results along their descriptions and supposed mean of exploitation.

Table 2 1: Exploitable Results

Exploitable Result	Means of exploitation
Identification of potential use cases and related requirements and design of system architecture with required functionalities.	By **telco operators** to setup a heterogeneous 5G network comprising satellite and terrestrial wireless networks. By **service providers**, which can be provided with a key reference capable of creating new business models and facilitating the development of new applications. By standardization bodies to update relevant standards.
Analysis and simulation results and interference mitigation algorithms regarding spectrum sharing between satellite and cellular systems	By **telco operators** to optimize cell plan to minimize the interference with satellite links By **SNOs** to minimize interference and improve service quality By **standardization bodies** to develop specification that can avoid interference between cellular and satellite systems By **regulatory bodies** to harmonize and optimize spectrum resources
Open source channel model (e.g., ray-tracing-based channel model) allowing a common framework for cellular and satellite	By **telco and SNOs operators** to use for the optimization of cell planning for both cellular and satellite systems by predicting and avoiding possible coverage holes. By the **research community** to model and assess 5G systems including cellular and satellite systems.
PoC testbeds and trial platforms	By **standardization bodies** to validate the benefits of some concepts. By both **SNOs** and **MNOs** (Mobile Network Operators) to identify some viable interoperability scenarios.

The expected exploitable results cover a broad spectrum of possible application and transversal addressable markets, namely telecommunication, satellite and mobile operators, and service providers. Beyond these economic actors, standardization and regulatory bodies, and the overall research community may benefit from project results.

At the same time, within 5G-ALLSTAR we directly address vertical markets to foster adoption and facilitate knowledge transfer, eventually resulting in a faster business exploitation of the early results. Therefore, the partners of the project will coordinate their effort to address them directly and in accordance with their unique strategies.

2.2 Stakeholders Interests in the project

Table 2.1 below summarizes the objectives of exploitation of the partners in the consortium and are extended in the following Section 3.

Table 2 2: Identified objectives of exploitation

Partner	Role	Exploitation interest	Exploitation Overview	Target Vertical Market
GEM	Business school	Business models Business R&D	**Short term:** increasing the understanding of the reconfigurations of business models following the introduction of 5G networks and virtualized infrastructures. **Long term:** leverage the competences developed in the impacts of 5G on business models to study the condition that facilitates technology adoption and digital innovation diffusion	No single target market, but prioritizing the study of those identified within the project: transport, public safety markets, and rural communities
HHI	Research Institute	Integrated terrestrial / satellite channel model based on Quadriga	Further increase the user base of Quadriga by adding features that allow the satellite communications community as well as the vertical industry to get an understanding of the physical characteristics of the terrestrial radio access network and especially the impact of an overlay satellite constellation on top of that.	No specific target vertical market.
CRAT	Research consortium	Traffic Flow controllers for Multi-Connectivity; Quality of Experience management systems;	**Short term:** increasing the know-how of the company and general awareness regarding 5G by teaching activities and workshops in the masters held at the Universities constituting CRAT; dissemination of the scientific results of the project; development of a prototype for the demonstration of the proposed solutions starting from the PoC of the project. **Long term:** Contacts with SMEs and general technology transfer activities for the development of a market-ready solution that derives from the results of the project; Involvement in new and more advanced research projects.	No single target market, but prioritizing the study of those identified within the project: transport, public safety markets, and rural communities

Partner	Role	Exploitation interest	Exploitation Overview	Target Vertical Market
ETRI	Research Institute	Product, Standard and R&D (mmWave-band vehicular communication systems)	**Short term:** dissemination of the scientific results of the project; development of a prototype system for the demonstration of the proposed solutions. **Long term:** continuous participation in relevant standardization activities to secure IPRs from research results; technology transfer to Korean SMEs through technology licensing, allowing them to reduce their R&D costs and strengthen their competitiveness; Involvement in new and more advanced research projects.	No single target market, but prioritizing broadband Wi-Fi service on public transportations (e.g., trains, city/express busses) and other V2X applications
KT SAT	Service Operator	Service	**Short term:** dissemination of the scientific results of the project; development of a prototype system for the demonstration of the proposed solution by aspect of satellite-based **Long term:** exploration how to this project outcome enable to develop global satellite business market and technologies to global customers	No single target market, but prioritizing the study of those identified within the project: transport, public safety markets, and rural communities
SKT	Service Operator	Service	**Short term:** dissemination of the scientific results of the project; development of a prototype system for the demonstration of the proposed solution **Long term:** exploration how to this project outcome enable to develop next cellular network technologies	No single target market
KATECH	Research Institute	Service R&D (mmWAVE-band vehicular communication systems for connected and automated vehicle application)	**Short term:** dissemination of the scientific or technical results of the project **Long term:** following standardization activities in ITS standardization in terms of hybrid V2X service for connected automated driving system	No single target market, but prioritizing the study of those identified within the project: transport, public safety markets, and rural communities
SnetICT	Enterprise	Service, R&D (mobile core network solution for automated vehicle application using multi-connectivity)	**Short term:** development of a prototype system for the demonstration of the proposed solutions. **Long term:** announcement and publication of research results; Discover business models and analyze technology economics related to market	No single target market, but prioritizing the study of those identified within the project: transport, public safety markets, and rural communities

3   Exploitable Knowledge and Individual plans

3.1   Grenoble Ecole de Management (GEM)

3.1.1   Mission and 5G vision

GEM accompany corporate performance by providing the knowledge, skills and talent to meet the economic challenges firms face today and prepare them for those that still lay in the future.

GEM international activities seek to respond to corporate recruitment needs, to develop talent, to promote faculty development and to give our students a multicultural dimension.

Thanks to its capacity to innovate and the continuous improvement of its intellectual contributions, GEM seeks to promote expertise in management of technology and innovation, entrepreneurship and responsible business practices.

5G technologies are the perfect example for GEM to be part of a radical shift that originating in the telecommunication industry, will have larger impacts for business, opening opportunities for new business model creation and reconfiguration.

The impacts that 5G diffusion will have on business and society represent a unique opportunity for deepening our understanding of the mechanisms related to the virtualization of infrastructures and digital business model creation and reconfiguration.

3.1.2   Exploitable Knowledge

The following table identifies the exploitable knowledge developed by GEM in the context of the project.

Table 3 1: GEM's exploitable knowledge

ID	Exploitable Knowledge	Target Vertical Market	Timeframe	Possible IP protection or exploitation
1.GEM	Business models of satellite 5G	No single target market, but prioritizing the study of those identified within the project: transport, public safety markets, and rural communities	3 years	Know-how
2.GEM	Capabilities of multi-connectivity 5G	No single target market, but prioritizing the study of those identified within the project: transport, public safety markets, and rural communities	3 years	Know-how

3.1.3   Opportunities for Exploitation

GEM has developed a unique expertise on management of technology and innovation in particular in the analysis of emerging fields as well as new business models. The collaboration with major worldwide players involved in advancing the 5G represents a unique opportunity to remain at the forefront in its core expertise, foster school's international reputation and visibility, even

with respect to current South Korean's partner universities. The collaborations with both European and South Korean partners playing leading roles in research and industry, will allow gem to gain early knowledge of emerging and innovative business model, thus enabling to anticipate societal and economic impacts of the 5G. The results produced within the context of the 5G ALL-STAR project will contribute to the development of current research streams through publications, and pedagogical materials. These materials will then provide a shared based for all partners to disseminate projects results, involve users and stakeholders, fostering their interests toward the 5G satellite, multi-connectivity opportunity.

3.1.4 Progress and outcomes

Currently the main activities focused on the accumulation of the knowledge necessary to frame the overall opportunity of multi-connectivity and 5G. Specifically, we focused on the analysis and understanding of the expected impacts and opportunities through the Delphi study and an analysis of the available documentation concerning current 5G based satellite businesses.

This initial body of knowledge is providing the base for further analysis and exploration of the business models specifically targeting vertical markets. The idea development workshop held within the group of partners enabled to diffuse an original method that can be appropriated by partners and provided an early input of possible business model configurations.

3.2 Fraunhofer Institute for Communications, Heinrich Hertz Institute (HHI)

The core competence of HHI is in the areas of mobile broadband systems, photonic networks, and electronic imaging technology for multimedia. The Wireless Communication and Networks (WN) department develops solutions within the broad area of wireless communication systems and networks ranging from information theory via channel measurement, algorithm and protocol design, system and network simulation right through to the implementation of algorithms in demonstrators and tests in the field.

The vision of the 5G-ALLSTAR project is to design, develop, evaluate and test multiple access based multi-connectivity using a combination of satellite and cellular access technologies supporting seamless reliable and ubiquitous broadband services. In order to reach this goal, HHI developed an extension of the well-established radio propagation simulator Quadriga. With this extension, Quadriga is now able to investigate not only terrestrial radio links, but also radio links from non-terrestrial systems like low earth orbit (LEO) or geostationary earth orbit (GEO) satellites as well as high-altitude platforms (HAPS).

The impact of non-terrestrial networks utilizing the same frequencies as radio networks on Earth are currently being investigated in the 5G-ALLSTAR project. The aim is to find solutions for spectrum sharing and multi-connectivity between terrestrial and non-terrestrial networks. The model itself as well as the outcome of such studies will be exploited by extending the user base of Quadriga, being the only known simulator able to perform this task.

Conducting workshops to introduce stakeholders to the software and demonstrating its applicability in the design process for new solutions in the field of mobile communications play an essential part of our exploitation strategy.

3.3 Consortium for the Research in Automation and Telecommunication (CRAT)

3.3.1 Mission and 5G vision

CRAT expects to reinforce and develop its collaboration with the consortium's members, in particular with end users and other research centers. The collaboration with the end users will enable CRAT to acquire familiarity with realistic and high-end testbeds, allowing the development of new researches in the scope of 5G, compliant with the latest standards and state of the art demonstrators.

Being a (non-profit) research consortium, CRAT intends to exploit the results of this project for didactic and teaching purposes. Several master courses and PhD theses will exploit the results coming from the research activities of 5G-ALLSTAR, either as teaching material or as research fields and directions.

For CRAT 5G represents the ideal scenario in which testing and developing control schemes and solutions related to the field of Network Control, as information streams steering, and management represents a crucial aspect of 5G and an important topic in Control Theory. The application of 5G to the automation field, as in IoT and Industry 4.0, will play a crucial role in the future researches of CRAT, making its study one of the utmost priorities of the CRAT consortium.

Seminars on the methodologies and results coming from the project will be held at the Universities that constitute the CRAT consortium and in the surrounding companies/universities. New generation researchers and engineers working for CRAT will acquire important know-how on 5G and traffic flow control, enriching the Network Control Theory related background of the group.

The final objective of CRAT is to sponsor the technology transfer of the most promising results produced during the 36 months of the project, by fully supporting start-ups in the field and SME in Europe, with the aim of developing commercial solutions.

3.3.2 Exploitable Knowledge

The following table identifies the exploitable knowledge developed by CRAT in the context of the project.

Table 3 2: CRAT's exploitable knowledge

ID	Exploitable Knowledge	Target Vertical Market	Timeframe	Possible IP protection or exploitation
1.CRAT	Traffic Flow Control algorithms and solutions	Every utility network (power, gas, water, transport…) control system may benefit from some of the results developed in WP4, even if the main target market is, by design, Telco operators.	3 years	Know-how
2.CRAT	QoE-aware traffic steering	Quality of Experience-based control systems are an emerging solution for 5G service provision. No particular vertical has been identified among the ones identified by the project as the most impactful for 5G.	3 years	Know-how
3.CRAT	Adaptive video streaming tailored to satellite 5G	Entertainment and media delivery systems	3 years	Know-how

3.3.3 Opportunities for Exploitation

Most results of the project coming from CRAT's effort will be published in international journals and conferences in the fields of Telecommunication systems and Control Theory, enabling a peer confrontation with other researchers in the field.

The technology transfer of these results could involve the contact with SME of the field for the prototyping of ad-hoc solutions ready for the market.

It is envisaged that in future collaborations with the 5G-ALLSTAR consortium partners take place, either in research projects or in other R&D activities.

3.3.4 Progress and outcomes

At the moment CRAT is in the finalization process of the Control Algorithm solutions for QoE-aware traffic steering, in the multi-connectivity scenarios of WP4. The first activities for the development of the PoC of the project are undergoing, and no deviation from the GA is present.

Four scientific publications have already been produced by the members of CRAT, and the courses of Control of Communication and Energy Networks and Control of Multi-Agent Systems held at the university of Rome "La Sapienza" have already been updated with the preliminary results attained by CRAT, in both topics and course material.

3.4   Electronics and Telecommunications Research Institute (ETRI)

3.4.1   Mission and 5G vision

As a government funded research institute and a key technology innovator in Korea, ETRI is carrying out numerous research projects on developing 5G and future mobile communication systems. As an extension of ETRI's previous and current research, 5G-ALLSTAR project provides a great opportunity to exploit our accumulated technical know-how and outcomes of previous research to facilitate technological evolutions of this project, primarily focusing on cellular and satellite multi-connectivity technology and its applicability to mmWave-band vehicular communication systems through a close collaboration between European and Korean partners.

3.4.2   Exploitable Knowledge

The following table identifies the exploitable knowledge developed by ETRI in the context of the project.

Table 3 3: ETRI's exploitable knowledge

ID	Exploitable Knowledge	Target Vertical Market	Timeframe	Possible IP protection or exploitation
1.ETRI	IPRs related to the specification design and the developed key enabling technologies for mmWave-band vehicular communication system	No single target market, but prioritizing broadband Wi-Fi service on public transportations (e.g., trains, city/express busses) and other V2X applications	3 years	Know-how
2.ETRI	Software/hardware design (e.g., source codes and associated technical documents) of mmWave-band vehicular communication system with beam switching and cellular-satellite multi-connectivity techniques	No single target market, but prioritizing broadband Wi-Fi service on public transportations (e.g., trains, city/express busses) and other V2X applications	3 years	Know-how

3.4.3   Opportunities for Exploitation

To secure relevant IPRs from the research results of 5G-ALLSTAR project, ETRI will continuously participate in international standardization activities relevant to mmWave-band vehicular communication systems and cellular and satellite multi-connectivity technologies by contributing to the corresponding specification development.

Furthermore, the research results of 5G-ALLSTAR project including IPRs (e.g., patents) and outcomes of software/hardware design (e.g., source codes and associated technical documents) will be sold or made available to Korean SMEs through technology licensing, which allows them to reduce their R&D costs and strengthen their competitiveness. The potential vertical market

that the Korean SMEs can target could be broadband Wi-Fi service on public transportations (e.g., trains, city/express busses) and other V2X applications.

It is also expected that the joint outcomes of 5G-ALLSTAR will be not only utilized for ETRI's future research, but also facilitate future collaboration with the 5G-ALLSTAR consortium partners, either in research projects or in other R&D activities.

3.4.4 Progress and outcomes

ETRI has implemented the first version of trial platform for mmWave-band vehicular communication system called Moving Network (MN) system. With the MN system that introduces a developed beam switching technique, ETRI has successfully conducted a preliminary test in the center of Daejeon city, showing that the data rate of link between the vehicle UE installed on the roof of the vehicle and the gNBs deployed on top of the building can reach up to 2.5 Gbps. It was also observed that even when the vehicle changes lanes or overtakes, a satisfactory performance can be achieved.

In addition, in close collaboration with KTsat, ETRI has also carried out a preliminary test of our satellite communication system, which will be integrated with the mmWave-band vehicular communication system using the developed cellular and satellite multi-connectivity technique to enhance system performance mainly in terms of service continuity and reliability.

Several scientific publications including both journal and conference papers have already been produced by ETRI, and in 3GPP SA5 meeting, ETRI's proposal on defining use case for multi-RAT load-balancing associated with a satellite RAN and a terrestrial RAN has been approved.

3.5 Korea Telecom Satellite (KT SAT)

3.5.1 Mission and 5G vision

As a wholly owned by KT Corps, the largest telecom/media service provider in Korea, KT SAT is the only one satellite service provider in Korea. As a part of customer service, KT Sat provides satellite-based mobile communication backhaul for LTE coverage over remote area using LTE Femtocell and satellite links.

With 5G-ALLSTAR Project and our real-field experiences, KT Sat believes that this project outcome enable to develop global satellite business market and technologies through combined 5G Network and satellite through development of a prototype system for the demonstration of the proposed solution by aspect of satellite-based.

3.5.2 Opportunities for Exploitation

Currently, global satellite industry including KTSAT, is under conduct researching with a lot of interest in interworking technologies between satellite and 5G, such as 5G-ALLSTAR project. KT SAT expects to be able to acquire technologies and know-how to provide multi-connectivity services to customer on moving vehicle (such as cars, vessels, etc.) by successfully executed 5G-ALLSTAR project.

3.6   SK Telecom (SKT)

3.6.1   Mission and 5G vision

SK Telecom is the largest mobile operator in Korea with nearly 50 percent of the market share. The company successively commercialized 5G network on December 1st, 2018 and launched the world's first 5G B2B service for smart factory. Then the company commercialized the world's first 5G smartphone for 5G B2C service, Samsung Galaxy S10 5G, for purchase in Korea starting April 3, 2019. As one of the main research topics of inter-operability between cellular and sate-lite systems, 5G-ALLSTAR project provides a great opportunity to investigate the feasibility of multi-connectivity technologies and verify the commercial launch of inter-operable systems, especially, its applicability to mmWave vehicular communication systems through close collaboration between European and Korean partners.

3.6.2   Exploitable Knowledge

The following table identifies the exploitable knowledge developed by SKT in the context of the project.

Table 3 4: SKT's exploitable knowledge

ID	Exploitable Knowledge	Target Vertical Market	Timeframe	Possible IP protection or exploitation
1.SKT	Service feasibility for mmWave solutions, architecture design know-how for inter-operable systems between cellular and sate-lite systems	No single target market, but prioritizing mmWave service for 5G	3 years	Know-how

3.6.3   Opportunities for Exploitation

SKT will attend in 3GPP standardization activities relevant to mmWave systems and cellular and satellite multi-connectivity technologies. Furthermore, the company will try to exploit the lessons learned of the research results of 5G-ALLSTAR project including IPRs (e.g., patents) and outcomes of software/hardware design (e.g., source codes and associated technical documents) to evolve SKT's 5G network. The company hope that the outcomes of 5G-ALLSTAR project will be not only utilized for SKT's research way-forward, but also consider future collaboration with the partners of 5G-ALLSTAR project.

3.7   SNET Information and Communication Technology (SnetICT)

3.7.1   Mission and 5G vision

The core capability of SnetICT is to develop core network solutions that provide 5G heterogeneous access through multi-connectivity research.

SnetICT analyzes 5G ALL-STAR's various use-case, KPIs, and potential business models targeting related industry markets and design and define a technology framework that provides the overall architecture and key components of the PoC test bed.

Based on the preceding analysis, design and definition, SnetICT will develop the multi-connectivity core network architecture and load balancing algorithm in cellular and satellite network through researches.

Through the previous process, SnetICT aims to develop multi-connectivity-enabled core solutions and build a test bed and implement and demonstrate prototypes of 5G cellular and satellite access systems.

3.8   Korea Automotive Technology Institute (KATECH)

3.8.1   Mission and 5G vision

KATECH in Korea is the Korea's only R&D institute specializing in automotive parts providing comprehensive and systematic technical support and playing a leading role in technology development. KATECH has been established with government and private fund to support systematic R&D for auto part industry in Korea based on "Industrial Technology Innovation & Promotion Law".

With rich experience and knowledge of automotive communication system such as CAN, WAVE, Wi-Fi, and etc., KATECH will develop traffic aggregation technology among 5G network, satellite modem, and Wi-Fi network. KATECH will also provide urban type smart vehicle testbed supporting various communication system such as WAVE, Wi-Fi and 5G for 5G ALL-STAR Korean trial.

4 User and stakeholder groups involvement

Project stakeholders play an important role in advancing and fostering the exploitability of results. At project level we identified three main target verticals in the area of:

1. transport (e.g. public safety, railway transportation sectors, etc.);

2. public safety;

3. rural communities.

We will aim at creating a valuable business model proposition for each user group starting from the results of Task 2.4 and the following results of the 5G-ALLSTAR project. Each stakeholder would then be in a position to customize the model and support material based on their exploitation needs and capabilities. The business models should be specific for each sub-group targeted. It would be necessary for each business model, to provide an assessment around relevant dimension of value, for example:

1. economic (e.g., cost, price, volume, etc.);

2. functional (e.g., increasing stakeholder's productivity, flexibility, reliability, etc.);

3. competitive (e.g., value appropriation opportunity, industry configuration, etc.);

4. strategic (e.g., intended market strategy, growth strategy, penetration strategy)

Depending on the stakeholder, further dimensions of value could be explored (e.g., societal, environmental). The following dissemination activity, consisting of workshops and user involvement will enable the target audience to better assess their current capabilities and compare them with those enabled by satellite 5G and multi-connectivity. By providing a timely information on 5G-ALLSTAR achievement and capabilities, the addressed users may better appropriate of the novel technological opportunities, facilitating the conversion of the research result into tangible societal and business impact. Critical, will be the effort of all partners and stakeholders in facilitating the transfer of the actionable knowledge toward the target vertical markets.

4.1 Planned activities

As the objective is to foster the diffusion of 5G-ALLSTAR results toward vertical stakeholders the planned activities will mainly consists of:

1. Invitation to participate to both stakeholders and potential users to online workshop presenting and discussing the identified business models. We plan two workshops specifically targeting vertical stakeholder and business customers to be hold in the first half of 2021 supported by GEM's Digital, Organization and Society (DOS) industry-academia collaboration;

2. Invitation to participate to both stakeholders and potential users to workshops, workshops in conferences, or online workshops hold by partners, therefore fostering partners' ongoing dissemination activities and current vertical strategies;

3. Invitation to participate to both stakeholders and potential users in interviews rounds to diffuse the developed knowledge on the exploitability of 5G-ALLSTAR results and foreseeable applications and, at the same time, to prove as an important activity to gather feedbacks from qualified informants.

4. Inviting both stakeholders and potential users to upcoming KR/EU-standalone or joint EU-KR technical demonstrations hold by partners, promoting the research results of 5G-ALLSTAR, providing the invitees with new 5G experiences that the outcomes could bring, and gathering feedbacks on relevant business models. In particular, the final

demonstration, in June 2021, will take place – on the EU side – at the Leti Innovation Days (LID). This event, organized by CEA in Grenoble, brings together business leaders, tech entrepreneurs, investors and R&D managers from all over the world. More than one thousand people attend the conferences during the LID week. This audience will be a prime target for the 5G-ALLSTAR demonstration of concepts.

In parallel to the exploitation activities targeting organizations and business in the vertical markets, we will try to gather, when appropriate, final users' feedbacks concerning the opportunity offered by satellite 5G and multi-connectivity. In particular, elements of final users' value perception could be gathered during the demonstration of 5G-ALLSTAR PoC at a key event.

Finally, we will leverage face-to-face meetings to acquire stakeholders' feedbacks and ideas as we already did both in Grenoble and Jeju. The inputs of these meetings will be used for improving our knowledge and aims at leveraging the competences within the group to nurture business model ideation.

5 Conclusions

This deliverable document D6.9 "Plan for exploitation towards Vertical stakeholders" defines the proposed activities for 5G-ALLSTAR project results exploitation.

In this document, we first summarize the interests and goals of the main stakeholder planning to exploit project results toward the identified verticals in the area of transport (e.g. public safety sector, Railway Transportation), public safety and rural communities, and toward different addressable markets depending on their individual strategies (e.g., SMEs, B2B, B2C). Secondly, it describes the exploitation plans with regard to the identified exploitable knowledge on a by-partner basis, detailing the mission and vision for the respective partner, the exploitable knowledge, the opportunities for exploitation, and the current progress and outcomes up to this stage of the 5G-ALLSTAR project. Thirdly, we lay down the activities planned for involving project stakeholders and users in facilitating the transfer of the actionable knowledge toward the target vertical markets.

Overall, the timeframe for 5G-ALLSTAR project results exploitation corresponds mainly to the mid-term, targeting +3 years. While most exploitable results are still in the early stages and several challenges still lay ahead, we believe in their potential for exploitation. Indeed, multi-connectivity solutions for terrestrial-satellite communications have a high potential to be exploited and the System Architecture solution development and PoC for multi-connectivity are both expected to have a significant impact and generate the necessary input for successfully target the vertical markets.