



**EXPERIMENTATION AND VALIDATION OPENNESS FOR LONGTERM
EVOLUTION OF VERTICAL INDUSTRIES IN 5G ERA AND BEYOND**

[H2020 - Grant Agreement No.101016608]

Deliverable D7.3

Dissemination, Communication and 5GPPP Engagement Activities (intermediate)

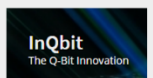
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Version 1.0

Date August 31st, 2022

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REVISION HISTORY

Revision	Date	Responsible	Comment
0.1	June, 1, 2022	NCSRD	1 ST Draft
0.2	June, 7, 2022	NCSRD	2 ND Draft
0.3	June, 20, 2022	NCSRD	3 rd Draft
0.4	July, 1, 2022	NCSRD	4 TH Draft
0.5	July, 8, 2022	NCSRD	Finalisation of contributions
0.6	July, 15, 2022		Final draft
0.8	July, 20, 2022	NCSRD	Final draft for internal review
0.9	August, 4, 2022	TID, LNV, INF	Internal review
1.0	August, 24, 2022	NCSRD	Final version

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GLOSSARY

<i>Abbreviations/Acronym</i>	<i>Description</i>
<i>3GPP</i>	<i>3rd Generation Partnership Project</i>
<i>5G IA</i>	<i>5G Infrastructure Association</i>
<i>5G-PPP</i>	<i>The 5G Public Private Partnership</i>
<i>CAPIF</i>	<i>Common Application Programmable Interface Framework</i>
<i>CO</i>	<i>Communication Objectives</i>
<i>CSA</i>	<i>Coordination and Support Action</i>
<i>DoA</i>	<i>Description of Action</i>
<i>Dx.y</i>	<i>Deliverable y of Work Package x</i>
<i>EuCNC</i>	<i>European Conference on Networks and Communications</i>
<i>GA</i>	<i>Grant Agreement</i>
<i>GA meeting</i>	<i>General Assembly meeting</i>
<i>IEEE</i>	<i>Institute of Electrical and Electronics Engineers</i>
<i>IoT</i>	<i>Internet of Things</i>
<i>KPI</i>	<i>Key Performance Indicator</i>
<i>KoM</i>	<i>Kick off Meeting</i>
<i>Mx</i>	<i>Month x</i>
<i>NEF</i>	<i>Network Application Function</i>
<i>NetApp</i>	<i>Network Application</i>
<i>NGI</i>	<i>Next Generation Internet</i>
<i>NGIoT</i>	<i>Next Generation Internet of Things</i>
<i>PU</i>	<i>Public</i>
<i>SME</i>	<i>Small Medium Enterprise</i>
<i>SNS</i>	<i>Smart Networks and Services</i>
<i>Tx.y</i>	<i>Task y of Work Package x</i>
<i>WG</i>	<i>Working Group</i>
<i>WP</i>	<i>Work Package</i>

List of Figures

Figure 1: EVOLVED-5G Logo Evolution.....	4
Figure 2: EVOLVED-5G Website	5
Figure 3: EVOLVED-5G's Website Main Menus.....	5
Figure 4: EVOLVED-5G Website's footer	6
Figure 5: EVOLVED-5G Home menu	6
Figure 6: EVOLVED-5G Home menu	7
Figure 7: EVOLVED-5G partners	7
Figure 8: EVOLVED-5G architecture	8
Figure 9: EVOLVED-5G objectives	8
Figure 10: EVOLVED-5G platforms	9
Figure 11: Partners' logos.....	9
Figure 12: EVOLVED-5G Dissemination menu.....	10
Figure 13: Trainings' list	11
Figure 14 Courses table	11
Figure 15: EVOLVED-5G Forum	12
Figure 16: EVOLVED-5G Accelerator Library	12
Figure 17: EVOLVED-5G's GitHub repository	13
Figure 18: Community – Accelerator webpage.....	13
Figure 19: Marketplace menu	13
Figure 20: EVOLVED-5G Marketplace	14
Figure 21: EVOLVED-5G News Webpage.....	14
Figure 22 EVOLVED-5G contact form	15
Figure 23: EVOLVED-5G Twitter account	16
Figure 24: EVOLVED-5G LinkedIn account	17
Figure 25: EVOLVED-5G Facebook account.....	17
Figure 26: Instagram Account	18
Figure 27: EVOLVED-5G newsletter front page.....	19
Figure 28: EVOLVED-5G newsletter back page	20
Figure 29: EVOLVED-5G leaflet.....	21
Figure 30 EVOLVED-5G poster	22
Figure 31: EVOLVED-5G MS Teams Environment	25
Figure 32: EVOLVED-5G Website Dashboard	37
Figure 33: EVOLVED-5G Website Dashboard	37
Figure 34: EVOLVED-5G Google Analytics	38
Figure 35: EVOLVED-5G Google Analytics	38
Figure 36: EVOLVED-5G LinkedIn Dashboard.....	39
Figure 37: EVOLVED-5G LinkedIn Total Followers Chart.....	40
Figure 38: EVOLVED-5G LinkedIn Total Post Chart	40
Figure 39: EVOLVED-5G Twitter Dashboard.....	41
Figure 40: EVOLVED-5G Twitter Total Followers Charts	41
Figure 41: EVOLVED-5G Total Twitter Posts Charts	42
Figure 42: EVOLVED-5G Facebook Dashboard.....	43
Figure 43: EVOLVED-5G Total Followers Chart	43
Figure 44: EVOLVED-5G Total Posts Chart	43
Figure 45: EVOLVED-5G Instagram Dashboard	44
Figure 46: EVOLVED-5G Instagram Total Follower Chart.....	44

Figure 47: EVOLVED-5G Instagram Total Posts Chart	44
Figure 48: EVOLVED-5G Communication Timeplan	45
Figure 49: EVOLVED-5G Communication Phases	46
Figure 50: WP6 related post.....	47
Figure 51: Marketplace YouTube sample post.....	48
Figure 52: Dedicated Hashtags.....	48
Figure 53: NEF emulator article in cordis.eu	49
Figure 54: EVOLVED-5G activity on 5G-PPP platform	50
Figure 55: EVOLVED-5G reshared material	50
Figure 56: EVOLVED-5G EUCNC image.....	51
Figure 57: EVOLVED-5G in 5G-PPP Phase 3 Project Brochure – page 1	57
Figure 58: EVOLVED-5G in 5G-PPP Phase 3 Project Brochure – page 2.....	58
Figure 59: EVOLVED-5G in European 5G Annual Journal-page 1	59
Figure 60: EVOLVED-5G in European 5G Annual Journal-page 2	59
Figure 61: brochure “European SME Expertise in 5G and Beyond”	60
Figure 62: “European SME Expertise in 5G and Beyond”- Internet Institute profile	60
Figure 63: “European SME Expertise in 5G and Beyond”- 8bells profile	61
Figure 64: “European SME Expertise in 5G and Beyond”- Infolysis profile.....	61
Figure 65: “European SME Expertise in 5G and Beyond”- Fogus profile	62
Figure 66: EVOLVED-5G project in the 5G-PPP website.....	64
Figure 67: Announcement of EVOLVED-5G NEF Emulator in the 5G-PPP website.....	65
Figure 68: Announcement of 3GPP CAPIF’s Core Function in the 5G-PPP website.....	66

List of Tables

Table 1: EVOLVED-5G Social Media Channels.....	15
Table 2 EVOLVED-5G Newsletter Issues.....	18
Table 3 EVOLVED-5G Meetings	25
Table 4: EVOLVED-5G Dissemination KPIs.....	26
Table 5: Publications in Conferences	27
Table 6 Publications in Journals	28
Table 7: EVOLVED-5G White Papers	28
Table 8: EVOLVED-5G Articles	29
Table 9: Press Releases table	29
Table 10: Book Chapters	30
Table 11: EVOLVED-5G Presentations.....	31
Table 12: EVOLVED-5G Special Sessions and Workshops co-organised	34
Table 13: EVOLVED-5G participation in other events	34
Table 14: Current Status of the Dissemination plan	35
Table 15: EVOLVED-5G Communication Summary	36
Table 16: EVOLVED-5G Communication Phases	45
Table 17: Dissemination Plans	51
Table 18 EVOLVED-5G Target Audience.....	52
Table 19 EVOLVED-5G 5GPPP WGs and representatives.....	54
Table 20: Contributions to the Pre-Standardization WG	63

EXECUTIVE SUMMARY

The EVOLVED-5G project, through the D7.3 deliverable, presents the progress and the updates towards the dissemination and communication activities and project's interaction with the 5G-PPP and the rest 5G-PPP research projects during the first 20 months of the project. All communication channels and performed activities are described in detail and evaluated against the goals that had been set by the EVOLVED-5G communication and activities plan. Statistics, results and impact are analyzed and plans/KPIs for next period's activities are presented.

The plan that has been initially set for the progress of WP7 will be constantly updated throughout the entire project lifetime, and adapted to the project's evolving requirements, for attaining the greatest project visibility, audience and impact. Adaptation will also take into account the changes in the environment, in which the project is being executed, e.g., the state and effects of the COVID-19 pandemic as well as the commercial evolution of 5G.

TABLE OF CONTENTS

1	INTRODUCTION	1
1.1	SCOPE	1
1.2	TARGET AUDIENCE	1
2	DISSEMINATION AND COMMUNICATION	3
2.1	CHANNELS OF COMMUNICATION	3
2.1.1	EVOLVED-5G Logo	3
2.1.2	EVOLVED-5G Website Logo (3rd version)	3
2.1.3	EVOLVED-5G Website	4
2.1.4	EVOLVED-5G Social Media Channels & Statistical Dashboards	15
2.1.5	EVOLVED-5G Newsletter	18
2.1.6	EVOLVED-5G Press Releases	20
2.1.7	Other Means and Channels	21
2.2	MEANS OF DISSEMINATION	23
2.2.1	Publications in journals	23
2.2.2	Publications in workshops and conferences	23
2.2.3	Active participation in 5G-PPP activities	23
2.2.4	White Papers & 5G-PPP papers	23
2.2.5	Presentations in scientific events, conferences and forums	23
2.2.6	Trials and Showcases	23
2.2.7	Organization of events (workshops/seminars/webinars)	23
2.2.8	Exhibitions in industrial and scientific events	24
2.2.9	Academic and research community focused dissemination	24
2.3	MEANS OF MONITORING WP7 ACTIVITIES	24
2.3.1	MS-Teams Online Platform	24
2.3.2	WP7 telcos	25
2.3.3	GA Meetings	25
2.3.4	Mailing lists	25
2.4	EVALUATION, STATISTICS AND IMPACT UNTIL M20	26
2.4.1	Dissemination and Communication Goals (M4-M20)	26
2.4.2	Summary of Communication Achievements and Statistics (M1-M20)	27
2.4.3	Summary of Dissemination Achievements (M1 -M20)	36
2.4.4	Website Performance, Statistics and Dashboards	37
2.4.5	Social Media Performance, Statistics and Dashboards	39
2.4.6	Communication, Dissemination updated plan and goals for the next period of the project	45
3	5G-PPP ENGAGEMENT AND ACTIVITIES	54



D7.3 Intermediate report on the dissemination, communication and 5G-PPP engagement activities

GA Number 101016608

3.1	EVOLVED-5G PARTICIPATION IN 5G-PPP BOARDS, WGS AND MEETINGS	54
3.1.1	Steering Board	55
3.1.2	Technical Board	55
3.1.3	Architecture WG	55
3.1.4	Software Defined Networks WG (SDN)	55
3.1.5	SME WG	55
3.1.6	Test, Measurement and KPI Validation WG (TMV)	56
3.1.7	Pre-Standardization WG (Pre-Std)	56
3.1.8	5GPPP Comms	56
3.2	ACTIVITIES UP TO M20	57
3.2.1	Contributions to 5G-PPP	57
3.2.2	Upcoming contributions	63
3.2.3	Interactions with other 5G-PPP Projects	64
3.3	EVOLVED-5G PRESENCE AT 5G-PPP CHANNELS	64
3.3.1	Evolved-5G in 5G-PPP Website	64
3.3.2	5G-PPP social media channels	66
4	CONCLUSION	67
5	REFERENCES	68

1 INTRODUCTION

1.1 SCOPE

This deliverable belongs to the set of WP7 deliverables, and it is directly linked to Task 7.1 Dissemination and Communication Activities and Task 7.2 Engagement in 5G-PPP Activities of WP7 framework.

T7.1 main objective is to describe initial impact plans and to devise and deploy sound impact creation action plans and strategies, required to achieve maximum visibility, as well as to maximize impact within business and scientific communities, guaranteeing fast and efficient communication, dissemination, exploitation and adoption of its outputs. Planned activities will be monitored throughout the project lifetime and periodically amended, so to ensure long term effectiveness and attainability. Dissemination activities will target related markets and industries with the objective of fully exploiting the novel business opportunities that are raised from related market activities and business functions.

In parallel, T7.2 focuses on the engagement with 5G-PPP activities. The project and technical coordinators of the project represent EVOLVED-5G in Steering Board and Technical Board respectively. In addition, the project contributes to 5G-PPP advances through its participation to several 5G-PPP Working Groups (e.g., SME, Pre-Standardization, Architecture, Test, Measurement and KPIs Validation).

The EVOLVED-5G project, through this deliverable provides details to its partners, target audience and stakeholders, about the actions and activities that have been applied by the EVOLVED-5G consortium up to M20 and are related to project's WP7 activities of communication, dissemination, and engagement with the 5G-PPP association. As part of the scope of this deliverable, it is worth mentioning that the use of EVOLVED-5G impact creation channels and the communicated content, address almost all tasks of the project, impacting in this way not only WP7 activities but also all the rest EVOLVED-5G WPs.

1.2 TARGET AUDIENCE

All EVOLVED-5G partners, through their participation in WP7 tasks (and specifically in T7.1 and T7.2), are already conducting and participating in multiple EVOLVED-5G impact activities, in various ways, depending on their competence fields, as well as the means, material, and audience to be addressed. For instance, industrial partners target relevant industrial sectors through their client portfolio, while academic and research institutes are targeting relevant technical and scientific audiences showcasing the attained project results and KPIs. Different target audiences' identification is important in order to build and implement effective communication, dissemination, and interaction with 5G-PPP and rest EU 5G-PPP projects which will serve suitably each profile by providing the relevant information about EVOLVED-5G project's activities and outcomes. Each target audience will get informed with the content that is most suitable to its interests, knowledge and needs, through the entire lifecycle of the project. In specific, the target audience of D7.3 is as follows:

- **Industry sector:** Any group that has an industrial professional background, technical knowledge and expertise, and is working on industry-related areas. In this group, producers, suppliers, vendors, verticals and SMEs are involved.

- **Industrial and 5G related research projects and communities:** Will be contacted as the reference research and innovation community, to coordinate strategic and operational efforts, helping to validate and sustain the EVOLVED-5G outcomes, and ensure more effective uptake of technological innovations in the target verticals, with the ambition of contributing to the excellence and leadership of the European industry in a global perspective.
- **Public and private service providers:** Current or future providers of 5G services, network operators, verticals and other relevant telecommunication providers that are interested in 5G services and systems.
- **Academia and Research institutions:** Academic institutions from the ICT and industrial sectors, e.g., higher education institutions, like universities and educational centers as well as national, public and private research institutes.
- **Researchers and freelancers, both in the academia and the industry** will be devoted to spread the benefits derived from the utilization of the EVOLVED-5G pillars and technologies, but also transfer and promote the scientific and technical know-how generated within the project. This target group can be effectively reached by initiatives and institutions in Europe and worldwide.
- **Standardisation Bodies and Open-Source Communities** are essential areas to focus on, in order to maximize the industrial impact, by fostering the uptake of 5G and NetApp developments in an industrial context and contributing to the creation and adoption of new standards and services.
- **Public Authorities, Initiatives and Policy Makers** given the continuous evolution and versatile worldwide applicability of 5G interoperability, as well as the speed of its spreading adoption, good information and meaningful engagement can go a long way to facilitate timely and effective exploitation.
- **Citizens / General Public:** comprises a wide group of stakeholders including citizens, students, and non-governmental organizations (NGOs) that could benefit from the adoption of the new IoT services and enhanced IoT capabilities offered via the EVOLVED-5G outcomes.
- **General Press:** includes specialized press and media agencies, online and offline channels, used to amplify the communication efforts of the EVOLVED-5G and thereby increase the impact of the planned dissemination and showcasing activities.
- **All EVOLVED-5G partners, collaborators, and stakeholders:** This document is addressed to the entire EVOLVED-5G consortium and has the role to introduce everyone to the impact means that have been set up and used through the lifetime of the project. Target stakeholders such as the industrial players, SMEs, and researchers in the industry 4.0, 5G and NetApp vertical segments (factories of the future, telecommunication companies, software enterprises etc.) that could uptake and/or complement and extend the EVOLVED-5G concepts, technologies and applications. The aim is to raise awareness about the work and results of the project, and reach consensus on pilots, functionalities, and targeted performance. The industry can be effectively reached by joint forces of the consortium, which gathers several industrial actors that are prominent in the 5G/NetApp scene and will play an essential role in the further engagement of other industry players from the broader ICT arena (e.g., IoT, NGIoT, NGI).

2 DISSEMINATION AND COMMUNICATION

2.1 CHANNELS OF COMMUNICATION

The communication channels and the tools used to enhance the visibility of the project, have already been established and used during the first months of the project and have been maintained and managed accordingly throughout the reported period (M18); during this period INFOLYSiS team who is in charge of the communication procedure, has tried to further intensify and diversify all related activities.

The scope of channels and means, which have been used during the reporting period for the completion of EVOLVED-5G communication activities, are listed below and updates on their status are provided in the upcoming sections:

- EVOLVED-5G logo
- EVOLVED-5G website
- EVOLVED-5G social media channels
- EVOLVED-5G newsletter
- EVOLVED-5G press releases
- Other Means and Channels
- Leaflets
- Posters

2.1.1 EVOLVED-5G Logo

The EVOLVED-5G logo, up to this moment, has gone through two different stages. The first stage was the logo that was used during the proposal phase of the project. Since the success of the proposal, the project's logo has been transformed into the interim one. This version of the project logo consists of two main parts. The first part is a factory image which refers to an Industry 4.0 environment, while the second part is the wording 'EVOLVED 5G', which represents the compartmental transformation to the Factory of Future (FoF) due to the use of the 5G technology.

A new one, more compact logo version was also created to be used in the social media accounts of the project (interim logo). During the KoM, partners openly discussed about updating the current main version of the logo in order to depict a more obvious connection between the factory and the wording. As a result, it has been decided for a rectangular grid to be added around the two parts, providing a more contemporary image (final logo). Therefore, the logo appearing in public since then, in the project's and 5G-PPP websites changed to the final one, while the one used in social media of the project was kept the same (interim one).

2.1.2 EVOLVED-5G Website Logo (3rd version)

Starting from end of January 2021, the above-mentioned final logo became the new main logo of the project along with several other variations created for versatile use in different formal events/occasions and media.

The following Figure 1 briefly showcases the evolution and the different templates of the EVOLVED-5G logo.

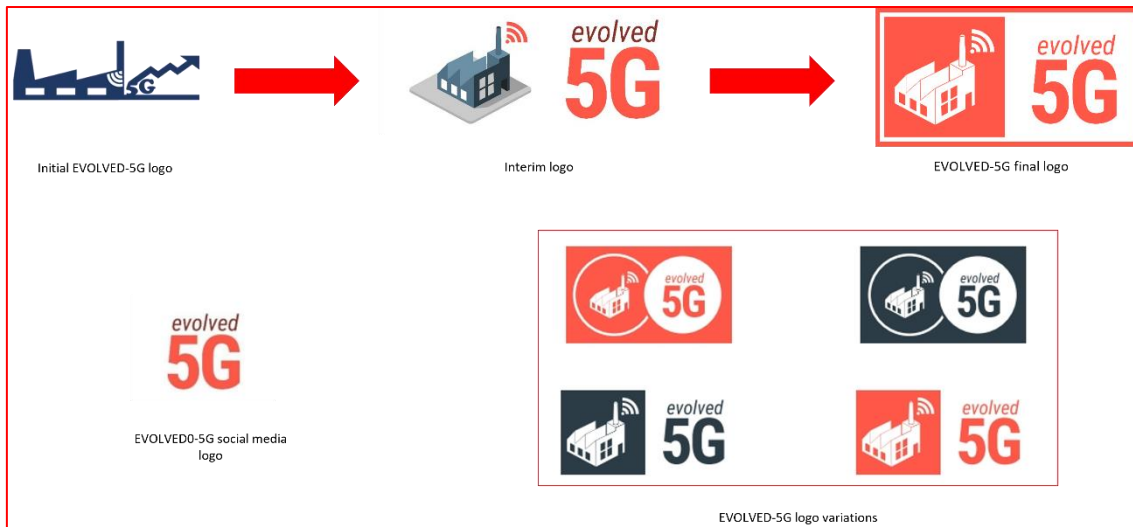


Figure 1: EVOLVED-5G Logo Evolution

2.1.3 EVOLVED-5G Website

The EVOLVED-5G project has established its official website at: <https://evolved-5g.eu/>, which acts as a portal for publishing information about the project, its identity, activities and results, ensuring that the project's scope is maintained and communicated across various vertical industries and stakeholders. The EVOLVED-5G website has been designed and developed in early January of 2021 and officially released in public on Friday 8th of January 2021. In more detail, for the EVOLVED-5G website:

- Developed using WordPress ver. 5.7 by NCSRD and INF teams and it is constantly updated to newer versions/updates
- Domain name owned by INF partner for 6 years
- Website hosting is offered by INF
- Content is being constantly updated by INF and NCSRD teams on a weekly basis
- Contact Form is provided addressing the Project Coordinator, Technical manager and T7.1 leader
- reCAPTCHA v3 protection is enabled
- Google Analytics is enabled for accurate website statistics

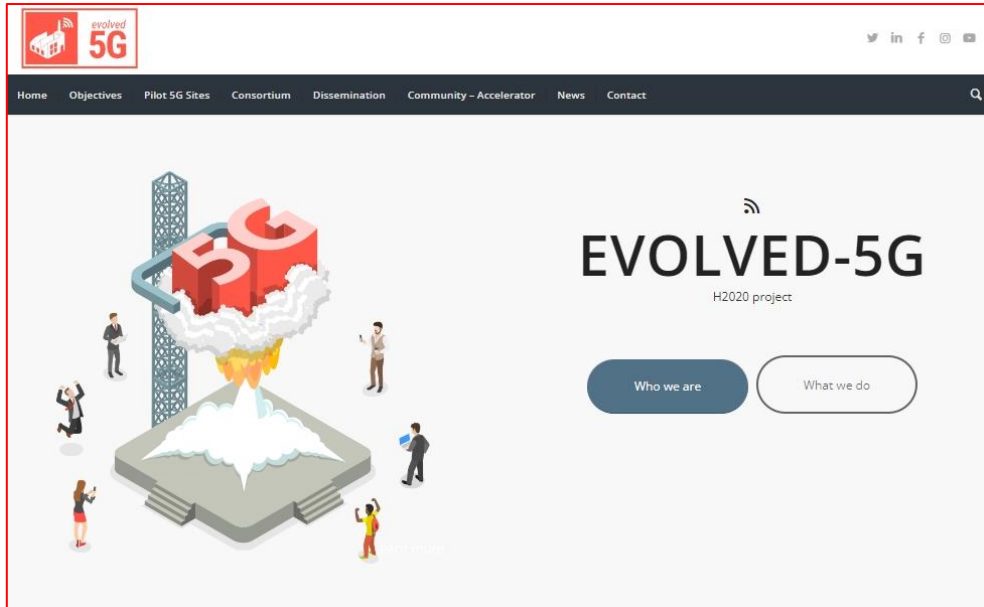


Figure 2: EVOLVED-5G Website

The main EVOLVED-5G project communication and impact objectives are fulfilled by the website's compact, comprehensive, and easy-to-use structure. Home, Objectives, Pilot 5G Sites, Consortium, Dissemination, Community – Accelerator, Marketplace, News and Contact are the 9 main menu options provided by the website. At this point, it is important to mention that two additional main menu tabs (Community – Accelerator and Marketplace) were created during March 2022 in order to help and facilitate the EVOLVED-5G Community Building and Marketplace activities of WP6.

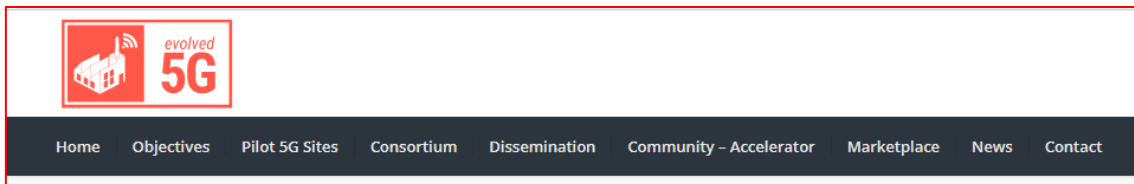


Figure 3: EVOLVED-5G's Website Main Menus

A footer section, shown in Figure 4, is also provided at the end of each webpage of the EVOLVED-5G website, containing important information, such as project identity, news' tags, information about Visitors and links to the EVOLVED-5G social media accounts. In the footer section, it is also stated, that the EVOLVED-5G project is an EU funded project, part of the 5G Public Private Partnership (5G-PPP).

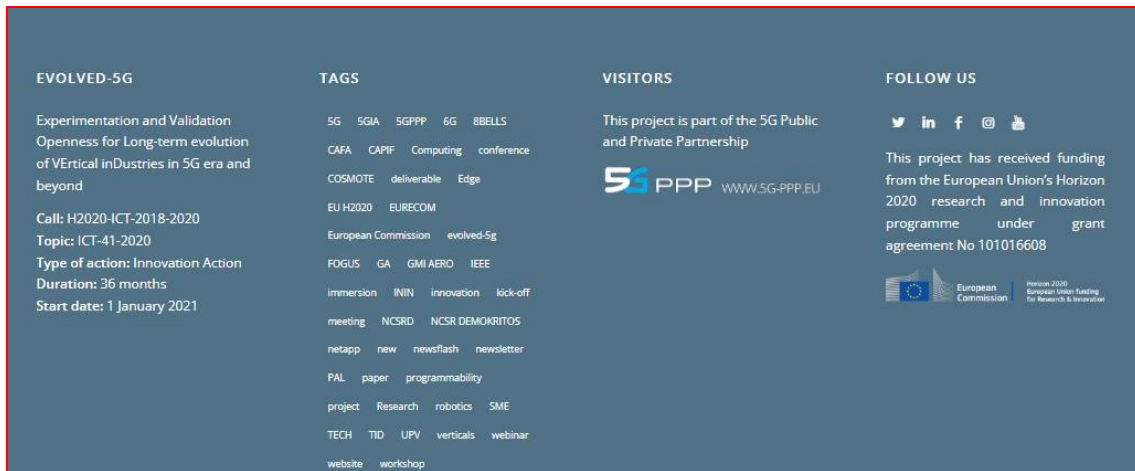


Figure 4: EVOLVED-5G Website's footer

2.1.3.1 Constantly Updated Website Sections

As we have stated earlier, the EVOLVED-5G website has 9 basic menu tabs, in which every interested stakeholder may read and learn everything about the project. In this section a short analysis of each one is taking place along with all relevant updates.

- **Home (<https://evolved-5g.eu/>)** The Home Page of EVOLVED-5G website, provides a quick overview of the project and a smooth navigation through the rest website sections/pages. EVOLVED-5G home page, acting as the first and main page of the website, aims initially to inform the visitors about the project's scope, NetApps and Target FoF Applications, an overview of which is also provided in the following figures (Figure 5 & Figure 6).

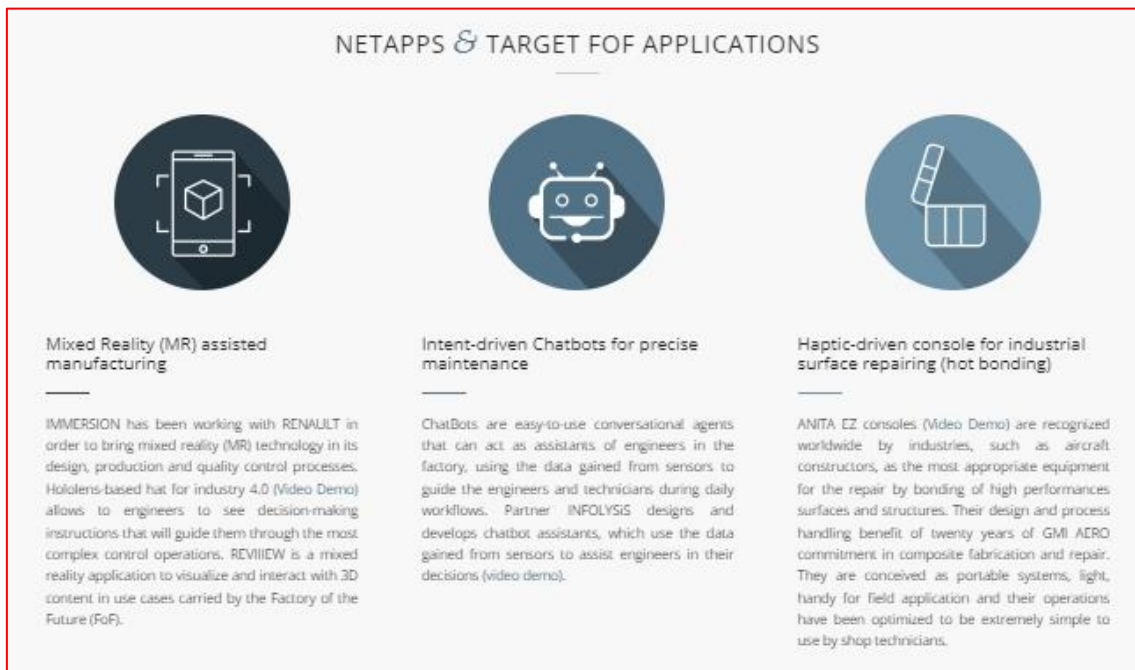


Figure 5: EVOLVED-5G Home menu

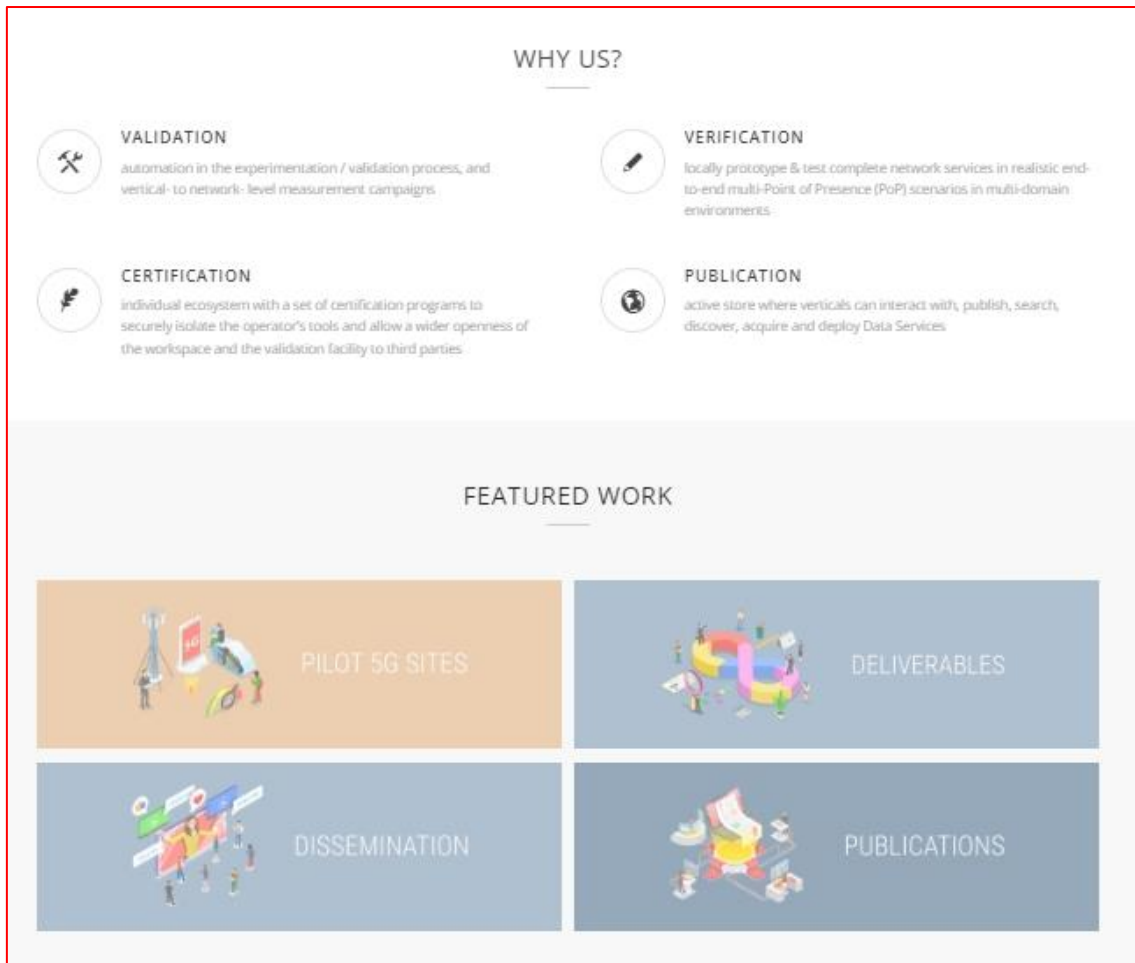


Figure 6: EVOLVED-5G Home menu

In addition, at the bottom of EVOLVED-5G Home Page (Figure 7) all partners' logos are hyperlinked pictures, provided here in a carousel format, for the visitors to be able to have a quick view of all the partners' profiles, and learn more about each of them by visiting their corporate websites.



Figure 7: EVOLVED-5G partners

- **Objectives** (<https://evolved-5g.eu/objectives/>) This webpage provides information about the motivation, the architecture and the objectives of the project. The objectives' menu briefly provides all the technical details and framework of the project (Figure 8 & Figure 9).

MOTIVATION AND SCOPE

The intense research work on 5G experimentation in Europe has reached the point where the evolved 5G capabilities, provided through the Service-Based Architecture (SBA), are to be exploited by third party innovators. Key enabler for this openness is the realisation of network programmability through standard APIs. An endeavor that is expected to shape a new and dynamic ecosystem in mobile networks from both the technology and marketing perspectives. Indeed, SBA allows the exposure of network services and capabilities through the Network Exposure Function (NEF), a border function of the 5G core network. Already, 3GPP has specified the procedures and the information flows for a common API framework (CAPIF) to address applicability, duplication and inconsistency aspects of the 5G northbound service APIs. In this context, vertical industries will be able to develop NetApps, i.e., to compose services by consuming 3GPP APIs (native APIs) as well as other telco assets (referring to business support system – BSS APIs, e.g. service orchestration APIs). For example, a NetApp could consume APIs that provide monitoring events and network slice configuration analysis to compose a service that guarantees quality of experience for latency-sensitive applications.

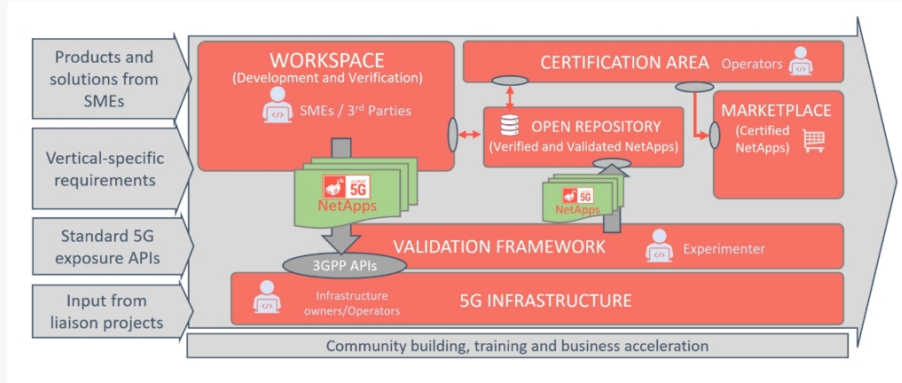


Figure 8: EVOLVED-5G architecture

SPECIFIC OBJECTIVES

OBJECTIVE 1

Upgrade the 5G experimentation potential in Europe, through the design, development, and release of an open 5G experimentation facility that will materialise network programmability and will expose standard 3GPP APIs (currently studied by 3GPP SA6) to enable automated NetApp validation tests.

OBJECTIVE 2

Materialize the openness of 5G to vertical industries by creating a NetApp development and verification environment, i.e., a workspace/SDK for third-parties, which will embrace the principles of continuous integration and continuous delivery (CI/CD) and adopt the software architecture used for microservices.

OBJECTIVE 3

Provide the means for enabling the digital market around the NetApps by designing, developing, releasing and maintain an active marketplace/App store that will incorporate vertical data space interaction (through IDS broker) and store NetApps that are certified by operator-driven certification tools.

OBJECTIVE 4

Provide a clear and quantified contribution towards the 5G penetration in smart manufacturing by designing, developing, validating, and publishing innovative NetApps and multiple applications on top of them that will cover major business use cases for the factories of the future.

OBJECTIVE 5

Quantify the performance and the flexibility that 5G provides to verticals, through a set of vertical-driven measurement campaigns, which will use standard reference points (e.g., the NWDAF), target critical network metrics and feed data a technoeconomic analysis.

OBJECTIVE 6

Maximise the technological fingerprint and the business potential expected from the integration of 5G in manufacturing, through targeted actions (trainings, workshops, and hackathons) for building an active community around NetApps development, as well as through an ambitious SME acceleration and engagement program (open access to the facility, mentoring events and business conferences).

Figure 9: EVOLVED-5G objectives

- **Pilots** (<https://evolved-5g.eu/pilot-5g-sites/>) EVOLVED-5G Pilots 5G page aims to introduce the visitor to the two 5G-PPP ICT-17 5GENESIS project's experimentation platforms (Athens and Malaga 5GENESIS experimental infrastructures) on which the proposal is based. An overview of the specific experimental platforms is initially provided (Figure 10).

ATHENS

The Athens platform will be implemented on the Athens.SGlink (www.athenssglink.eu) testbed. Athens.SGlink is an open 5G testbed being built, set up in the city of Athens. The testbed is going to be extended so to offer the telecommunication ecosystem an E2E experimental 5G platform, showcasing features of next generation networks, with particular focus on software network technologies (NFV/SDN) and edge computing for small cell infrastructures.



Short Description

Technologies available

MALAGA

Malaga platform aims the validation of selected 5G KPIs in indoor and outdoor 5G scenarios. Technologies in the platform are focused on integrating 5G with other access technologies (4G, WiFi, fiber, ...) with great automation capabilities to execute experiments both unattended and with real users. The initial plan, in the context of the project funded in ICT-17 call (5GENESIS), considers KPIs related to capacity, speed, latency, reliability, density of users, location accuracy, service creation time and network management (CAPEX/OPEX). The use cases to validate the KPIs are related to Mission Critical Services. Once the platform has been validated as a 5G environment, it will support other use cases and KPIs, coming from ICT-19 or from other projects. Expected use cases should require features related to eMBB and/or URLLC.



Figure 10: EVOLVED-5G platforms

- **Consortium** (<https://evolved-5g.eu/consortium/>) The Consortium Page illustrates a list of updated hyperlinked photos, with the logos of the consortium members being provided. These photos can be clicked in order to redirect the user to each member's corporate website and find more information about the specific partner. After the partners' section, the user can also find a table which provides details on the official participant organization name along with the short name used within the project and the country where the organization is located.



Figure 11: Partners' logos

- **Dissemination** (<https://evolved-5g.eu/dissemination/>) This page provides all the necessary details about the dissemination and communication activities performed by EVOLVED-5G partners. More specifically, this page acts as a menu hosting several sub

tabs which group and list the EVOLVED-5G activities. There are 7 different submenu options in this page, each dedicated to a specific section of the communication/dissemination activities. These menu options are the following ones:

- Publications
- Workshops/Presentations/Trials
- Articles
- Press Releases
- Deliverables
- Newsletters
- Events

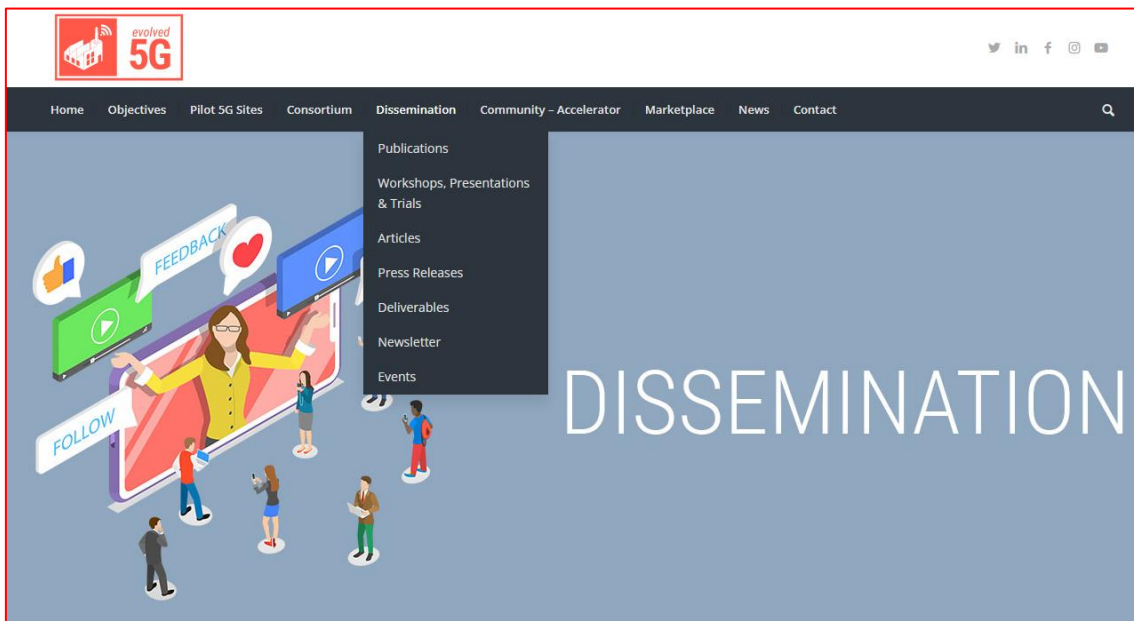


Figure 12: EVOLVED-5G Dissemination menu

Each user can navigate through these different options and select the category that he or she is interested in. Each of these categories have been thoroughly analyzed and explained in the D7.1 [1]. These categories are constantly updated with the activities performed by EVOLVED-5G partners. More information about the dissemination activities will follow on the dedicated dissemination chapter.

- **Community – Accelerator** (<https://evolved-5g.eu/community-accelerator/>) This menu has been created during March 2022 in order to record and monitor activities related to WP6 activities. WP6 is specialized in the creation of the EVOLVED-5G Community, so it's of outmost importance to monitor and guide the visitors to different platforms and channels to learn more about the community. The Community-Accelerator menu is divided in 5 different submenus.
 - **Trainings** (<https://evolved-5g.eu/community-accelerator/trainings/>)

This page lists the EVOLVED-5G Developers-oriented synchronous (i.e., live) training activities that were organized by EVOLVED-5G in the form of workshops, webinars, seminars, demos etc. targeting primarily academic audience (i.e., students, researchers, lecturers) in higher-educational

institutions, inspiring them the development and validation of NetApps in 5G Networks.

Training Events of EVOLVED-5G Community			
EVENT	DATE / LOCATION	TITLE	LINK
1. 5G Programmability Training Workshop by EVOLVED-5G and the Computer Science department of Athens Metropolitan College	21 & 22 March 2022 Athens Metropolitan College (Hybrid)	"5G Programmability New Opportunities and Perspectives in the context of European Research Project EVOLVED-5G"	Link 1 Link 2
2. Development of 5G Applications Training Seminar at the Universitat Politècnica de València (or by EVOLVED-5G & Communications Department of the Polytechnical University of Valencia)	30 May 2022 Universitat Politècnica de València (Hybrid)	"5G Applications"	
3. NCSR Demokritos Summer School	12 July 2022 NCSR Demokritos Campus (Physical)	5G Networks: Programmability Training Panel	http://summerschool.demokritos.gr/
Hands on Training Demos			
EVENT	DATE / LOCATION	DESCRIPTION	
1. 5G Programmability Training Workshop by EVOLVED-5G and the Computer Science department of Athens Metropolitan College	22 March 2022	INFOLYSIS NetApp demo by Theoni Dounia	
2. 5G Programmability Training Workshop by EVOLVED-5G and the Computer Science department of Athens Metropolitan College	22 March 2022	Internet Institute NetApp demo by Luka Korsic	
3. 5G Programmability Training Workshop by EVOLVED-5G and the Computer Science department of Athens Metropolitan College	22 March 2022	Zoritenet Demo by Andreas Oikonomakis	
4. 5G Application Training Seminar – NEF emulator live	30 May 2022	NCSR Demo by Anastasios Gogos	

Figure 13: Trainings' list

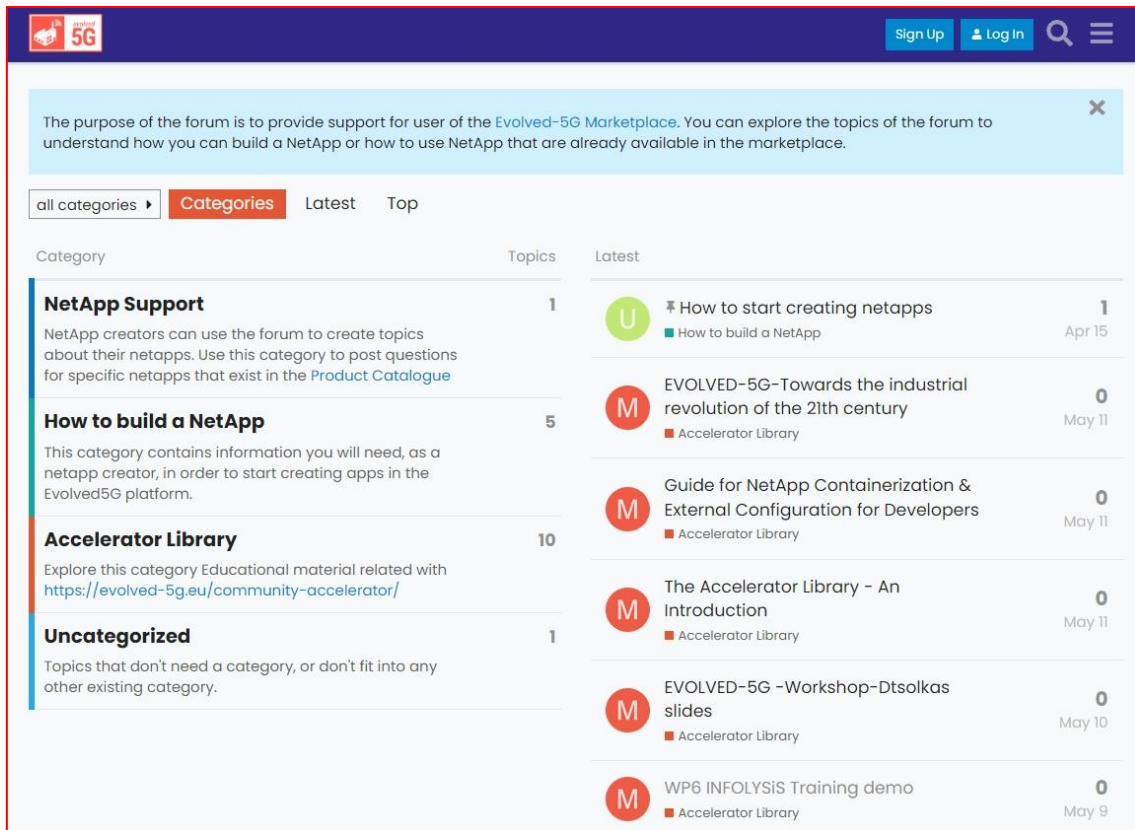
- **Courses** (<https://evolved-5g.eu/community-accelerator/courses/>)

Courses			
COURSE	DESCRIPTION	AUTHORS	LINK
1) EVOLVED-5G NetApps	NetApp concept	NCSR	TBA
2) EVOLVED-5G NetApp Development	Development of NetApps: – NetApp development process – Software tools for NetApp development	NCSR, ATOS, MAG, INF, UPV	TBA

Figure 14 Courses table

- **Forum** (<https://forum.evolved-5g.eu/>)

The purpose of the forum is to provide support to users of the Evolved-5G Marketplace. User can explore the topics of the forum to understand how to build a NetApp or how to use NetApps that are already available in the marketplace.



The purpose of the forum is to provide support for user of the [Evolved-5G Marketplace](#). You can explore the topics of the forum to understand how you can build a NetApp or how to use NetApp that are already available in the marketplace.

all categories ▾ **Categories** Latest Top

Category	Topics	Latest
NetApp Support NetApp creators can use the forum to create topics about their netapps. Use this category to post questions for specific netapps that exist in the Product Catalogue	1	<div>U</div> <div>How to start creating netapps</div> <div>How to build a NetApp</div> <div>1</div> <div>Apr 15</div>
How to build a NetApp This category contains information you will need, as a netapp creator, in order to start creating apps in the Evolved5G platform.	5	
Accelerator Library Explore this category Educational material related with https://evolved-5g.eu/community-accelerator/	10	<div>M</div> <div>EVOLVED-5G-Towards the industrial revolution of the 21th century</div> <div>Accelerator Library</div> <div>0</div> <div>May 11</div>
Uncategorized Topics that don't need a category, or don't fit into any other existing category.	1	
		<div>M</div> <div>Guide for NetApp Containerization & External Configuration for Developers</div> <div>Accelerator Library</div> <div>0</div> <div>May 11</div>
		<div>M</div> <div>The Accelerator Library - An Introduction</div> <div>Accelerator Library</div> <div>0</div> <div>May 11</div>
		<div>M</div> <div>EVOLVED-5G -Workshop-Dtsolkas slides</div> <div>Accelerator Library</div> <div>0</div> <div>May 10</div>
		<div>M</div> <div>WP6 INFOLYSIS Training demo</div> <div>Accelerator Library</div> <div>0</div> <div>May 9</div>

Figure 15: EVOLVED-5G Forum

- **Accelerator Library** (<https://forum.evolved-5g.eu/c/library/7>)

The library is a place where any interested stakeholder can browse different materials by the EVOLVED-5G partners in order to get guidance on the NetApps.

<div>How to start creating netapps</div> <div>How to build a NetApp</div> <div>1</div> <div>Apr 15</div>				
EVOLVED-5G-Towards the industrial revolution of the 21th century	M	0	25	May 11
Guide for NetApp Containerization & External Configuration for Developers	M	0	20	May 11
The Accelerator Library - An Introduction	M	0	16	May 11
EVOLVED-5G -Workshop-Dtsolkas slides	M	0	22	May 10
WP6 INFOLYSIS Training demo	M	0	30	May 9

Figure 16: EVOLVED-5G Accelerator Library

- **Github** (<https://github.com/EVOLVED-5G>)

GitHub, Inc. is an Internet hosting provider that specializes on Git-based software development and version control. In the EVOLVED-5G GitHub provider, any interested developer may find all related information about the NetApps and the EVOLVED-5G coding characteristics.

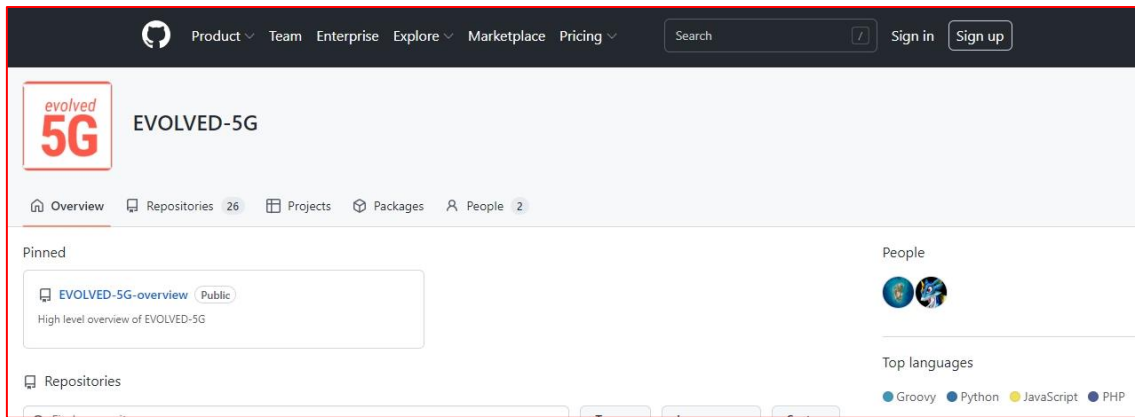


Figure 17: EVOLVED-5G's GitHub repository



Figure 18: Community – Accelerator webpage

- **Marketplace** (<https://evolved5g-marketplace.evolved-5g.gr/>) The marketplace menu (Figure 19) was added in the EVOLVED-5G website right after the official launch of the EVOLVED-5G marketplace. This menu works actually like a hyperlink which redirects instantly on the EVOLVED-5G marketplace (Figure 20).

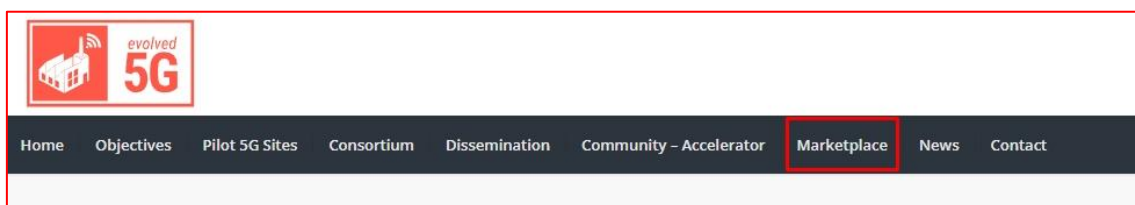


Figure 19: Marketplace menu

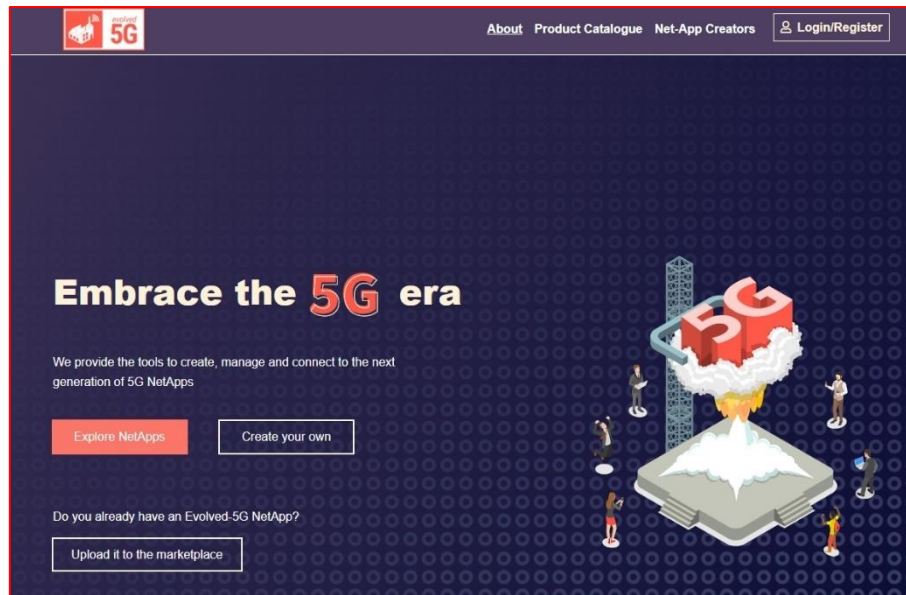


Figure 20: EVOLVED-5G Marketplace

- **News** (<https://evolved-5g.eu/news/>) The news webpage of the EVOLVED-5G website is the page which is most regularly updated. On a weekly basis short descriptions accompanied with hyperlinks for all the dissemination activities, news, trials and other impact-generating dissemination material concerning EVOLVED-5G project and 5G ecosystem overall (e.g., 5G-PPP, other 5G projects) are uploaded to this specific page. In that way, users can have a quick overview of the project's activities and learn more details about them in the form of online News.

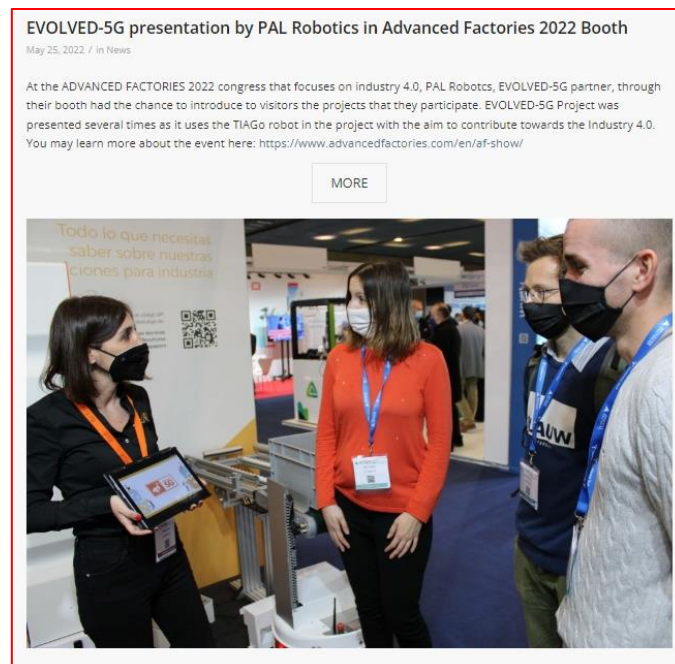
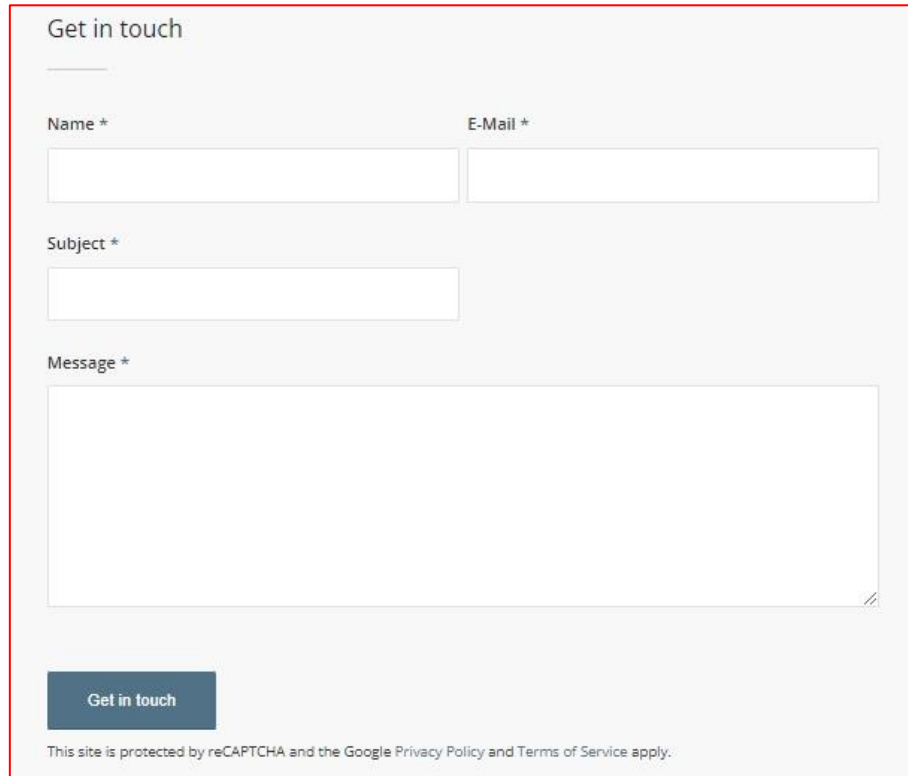


Figure 21: EVOLVED-5G News Webpage

- **Contact** (<https://evolved-5g.eu/contact/>) A contact form is available on the Contact page for the Project Coordinator, Technical Manager, and T7.1 Leader. This contact form connects stakeholders and potential users to the project management team in a bidirectional manner. It's also essential to have an online contact form that is easily accessible and easy to use, so that any new concerns or questions can be handled and resolved promptly by the project team.



The screenshot shows a web form titled "Get in touch". It includes input fields for "Name *" and "E-Mail *" (both marked as required), a "Subject *" field, and a large "Message *" text area. A blue "Get in touch" button is at the bottom. A small disclaimer at the bottom states: "This site is protected by reCAPTCHA and the Google Privacy Policy and Terms of Service apply."

Figure 22 EVOLVED-5G contact form

2.1.4 EVOLVED-5G Social Media Channels & Statistical Dashboards

Social media channels, along with the project website, also contribute to the effective communication of the EVOLVED-5G activities increasing awareness to the broader public. The project's presence in a wide range of social media channels leads to the wider exposure to diverse audiences in a cost-effective and efficient way increasing the project's outreach and social impact. Specifically, the following social media channels were created and running since early January of 2021: Twitter, LinkedIn, Facebook, Instagram, and YouTube. The links of all the EVOLVED-5G social media channels are provided below:

Table 1: EVOLVED-5G Social Media Channels

Twitter	https://twitter.com/evolved5g
LinkedIn	https://www.linkedin.com/in/evolved-5g-project/
Facebook	https://www.facebook.com/evolved5g
Instagram	https://www.instagram.com/evolved5g/
YouTube	https://www.youtube.com/channel/UCIGygB1TMxeZlWMOl3vajIA

EVOLVED-5G project utilizes different social media channels in order to address different target audiences and gain the maximum visibility. A short description of each EVOLVED-5G social media channel follows.

- **Twitter:** @evolved5g (<https://twitter.com/evolved5g>)

Twitter is one of the most prominent social media platforms in the world, and it can be used to promote EVOLVED-5G material to the general public while also boosting its worldwide reach and influence.



Figure 23: EVOLVED-5G Twitter account

- **LinkedIn:** @evolved-5g-project (<https://www.linkedin.com/in/evolved-5g-project/>)

LinkedIn is widely regarded as the world's largest professional and business networking platform. It's a dynamic social network that will allow the consortium to adequately communicate the project's accomplishments and impact to key businesses and professionals.



Figure 24: EVOLVED-5G LinkedIn account

- Facebook: @evolved5g (<https://www.facebook.com/evolved5g>)

Facebook is one of the most widely used social media platforms among the general public, as well as the strongest media choice for expanding a project's social media presence and reaching a broad audience of general interest. Because of its popularity, this platform has a good chance of facilitating successful interaction between stakeholders and the EVOLVED-5G Project using a less technical approach and content exchange.

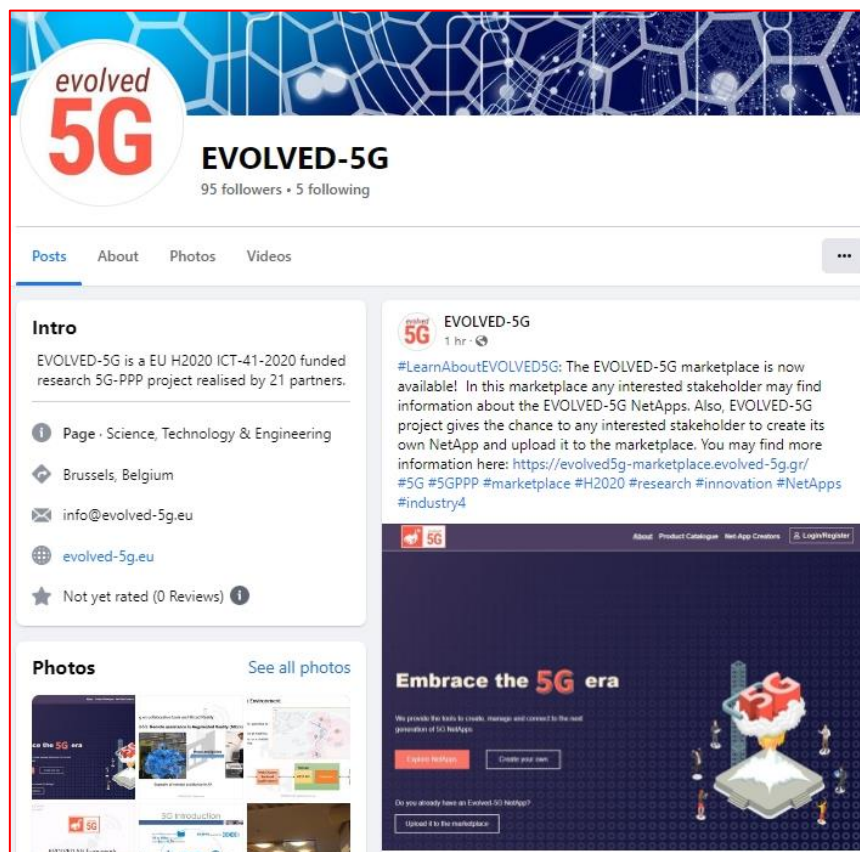


Figure 25: EVOLVED-5G Facebook account

- Instagram: @evolved5g (<https://www.instagram.com/evolved5g/>)

Instagram is the most popular social networking site for posting photos and videos. The EVOLVED-5G can reach new audiences and improve its visual distribution and communication impact by sharing photographs of the project's work and achievements, as well as other important material.

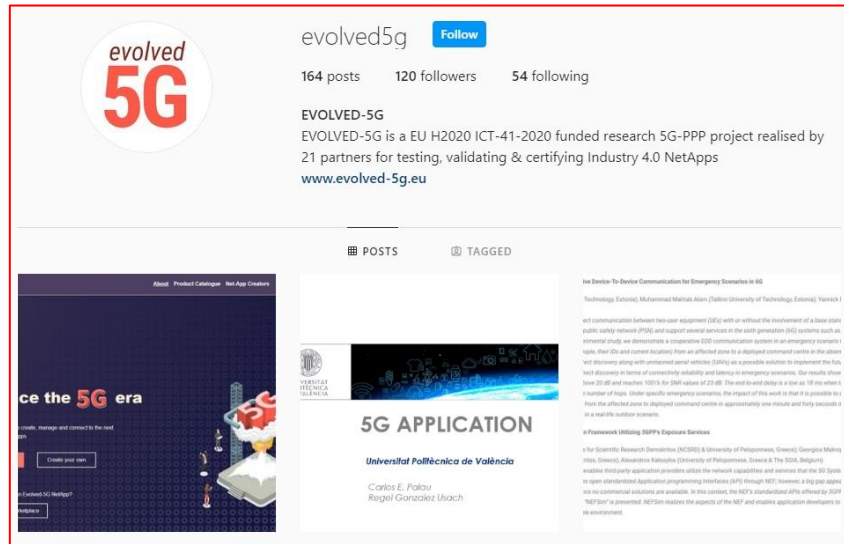


Figure 26: Instagram Account

2.1.5 EVOLVED-5G Newsletter

The Newsletter is an important part of the communication initiatives because it is used to disseminate the most recent news, announcements, and accomplishments of the EVOLVED-5G project on a frequent basis. The EVOLVED-5G newsletter's goal is to keep the community informed and involved in the project while also raising awareness and credibility. The newsletter is being published four times a year. The 1st issue of EVOLVED-5G newsletter, was published on the first quarter of the project (January-March 2021). The final newsletter of this reporting period is newsletter #6 which describes the April –June 2022 period. The following table, provides all the previous issues along with dedicated links. All newsletter issues are available online for downloading at the Newsletter page of the EVOLVED-5G website: <https://evolved-5g.eu/dissemination/newsletter/>.

Table 2 EVOLVED-5G Newsletter Issues

Newsletter Issue	Link
#1 January-March 2021	https://evolved-5g.eu/wp-content/uploads/2021/04/EVOLVED-5G-Newsletter-Issue-1.pdf
#2 April-June 2021	https://evolved-5g.eu/wp-content/uploads/2021/07/EVOLVED-5G-Newsletter-Issue-2.pdf
#3 July-September 2021	https://evolved-5g.eu/wp-content/uploads/2021/10/EVOLVED-5G-Newsletter-Issue-3.pdf
#4 October-December 2021	https://evolved-5g.eu/wp-content/uploads/2022/01/EVOLVED-5G-Newsletter-Issue-4.pdf
#5 January-March 2022	https://evolved-5g.eu/wp-content/uploads/2022/04/EVOLVED-5G-Newsletter-Issue-5.pdf
#6 April-June 2022	https://evolved-5g.eu/wp-content/uploads/2022/06/EVOLVED-5G-Newsletter-Issue-6.pdf



Figure 27: EVOLVED-5G newsletter front page



GA Plenary Meeting

The 4th GA meeting (virtual) of EVOLVED-5G took place on the 10th -12th of January. The first days' discussions were about the technical overview of the project and WP2 and WP3 status, planning and upcoming activities. The second day continued with WP3 and WP4 status, certification mechanisms and NetApps developments. The last day was about work package activities, communication and dissemination actions and activities related to EVOLVED-5G's involvement in the upcoming EUCNC.



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evolved-5g.eu
info@evolved-5g.eu



"This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101016608"

Call: H2020-ICT2018-2020
Topic: ICT-41-2020
Type of Action: Innovation Action
Duration: 36 Months
Start Date: 1 January 2021



Figure 28: EVOLVED-5G newsletter back page

2.1.1.6 EVOLVED-5G Press Releases

A press release is an essential and formal means of communication that publicizes key project news when it is required, and aids in reaching a wider audience through the press, as well as attracting traffic to the website and social media. All the press releases related to the EVOLVED-5G are available in the projects' website here: <https://evolved-5g.eu/dissemination/press-releases/>

2.1.7 Other Means and Channels

2.1.7.1 Leaflets

As an additional means of communication, the EVOLVED-5G partners designed and utilize a project-specific leaflet. The reader is attracted by the leaflet's fast but comprehensive summary of the project's goals and objectives. The EVOLVED-5G two-folded leaflet can be printed or used digitally to serve/support project needs in various dissemination situations. The project's logo and title, as well as its website URL and QR-Code, may be found on the first side, followed by a brief introduction to the EVOLVED-5G partners, or the relevant contact information and social media links. You may find the leaflet here: https://evolved-5g.eu/wp-content/uploads/2021/03/leaflet_v1.1.1.pdf

PARTNERS

EVOLVED-5G consortium brings together 21 partners, i.e., 3 research and academic institutions, 11 SMEs, 6 industrial partners, and 1 entrepreneurship accelerator, from 11 countries. The project is led by Telefonica I+D



INFORMATION AND CONTACT

Communication: info@evolved-5g.eu evolved-5g.eu

Call: H2020-ICT-2018-2020
Topic: ICT-41-2020
Type of Action: Innovation Action
Duration: 36 months
Start date: 1 January 2021



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Experimentation and Validation Openness for
Long-term evolution of Vertical industries
in 5G era and beyond

evolved-5g.eu



Project funded by the European Union's Horizon 2020 research and innovation programme under grant agreement No 101016608
This project is part of the 5G Public and Private Partnership




MOTIVATION

The intense research work on 5G experimentation in Europe has reached the point where the evolved 5G capabilities, provided through the Service-Based Architecture (SBA), are to be exploited by third party innovators. Key enabler for this openness is the realization of network programmability through standard APIs. An enabler that is expected to shape a new and dynamic ecosystem in mobile networks from both the technology and marketing perspectives. Indeed, SBA allows the exposure of network services and capabilities through the Network Exposure Function, a border function of the 5G core network. Already, 5GPP has specified the procedures and the information flows for a common API framework to address applicability, duplication and inconsistency aspects of the 5G non-standalone service APIs.

In this context, vertical industries will be able to develop NetApps, i.e., to compose services by consuming 5GPP APIs as well as other telco assets. For example, a NetApp could consume APIs that provide monitoring events and network slice configuration analysis to compose a service that guarantees quality of experience for latency-sensitive applications.

EVOLVED-5G embraces the potential of the emerging NetApp ecosystem under a twofold scope:

- Build an open experimentation facility for NetApp creation, validation, and certification, and
- Provide the means and the tools for long-term evolution of 5G-enabled vertical industries.

EVOLVED-5G will focus on Factory of the Future (FoF) applications, validated in 5G pilot sites to showcase the developed NetApps. The project shall also release a portable set up for on-site (real factories) demonstrations.



Abstract representation of the EVOLVED-5G approach

PILOT 5G SITES

EVOLVED-5G proposal is built on top of two 5G-PPP ICT-17 experimentation infrastructures in Athens and Malaga, which have been developed in the framework of 5GENESIS Project. Both facilities are composed of distributed components and are equipped with 5GPP R15 5G-NR infrastructure in bundle with a set of automation tools to support the experimentation by vertical users across multiple domains.

- The Athens platform will be implemented on the Athens 5Glink (www.athens5glink.eu) testbed. The testbed is going to be extended to offer the telecommunication ecosystem an E2E experimental 5G platform, showcasing features of next generation networks, with particular focus on software network technologies (NFV/SDN) and edge computing for small cell infrastructures.
- The Malaga platform aims the validation of selected 5G KPIs in indoor and outdoor 5G scenarios. The platform integrates 5G with other access technologies (4G, WiFi, fiber, etc.) with great automation capabilities to execute experiments both unattended and with real users.

NETAPPS & FACTORY OF FUTURE APPS

EVOLVED-5G framework is expected to lead to solutions in the following areas:

 Mixed Reality assisted manufacturing
  Intent-driven chatbots for precise maintenance

 Haptic-driven console for industrial Surface repairing
  IoT/M2M based remote monitoring platform

 AI-based video analyzer for industrial and robotics
  ML-driven anomaly detection system for industrial processes

 Blockchain data brokerage engine
  Security information and event management system

 AI-driven humanoid robot
  L7-aware whitebox switch with dynamic SFC & TSN support

 AI-driven logistics robotic fleets

Figure 29: EVOLVED-5G leaflet

2.1.7.2 Posters

The project's partners have also prepared a specific EVOLVED-5G Poster to support EVOLVED-5G communication and dissemination activities such as workshops, booths, presentations, webinars, seminars, trainings, and trials. The poster is designed in a concise and comprehensive manner in order to effectively express the project's key idea, boost awareness, and increase engagement. It offers brief details about the project's structure, scope, and projected NetApps. It may be printed (in both A1 and A2 size) or used digitally. You may find the poster here: <https://evolved-5g.eu/wp-content/uploads/2021/03/EVOLVED-5G-POSTER-final-A1.pdf>

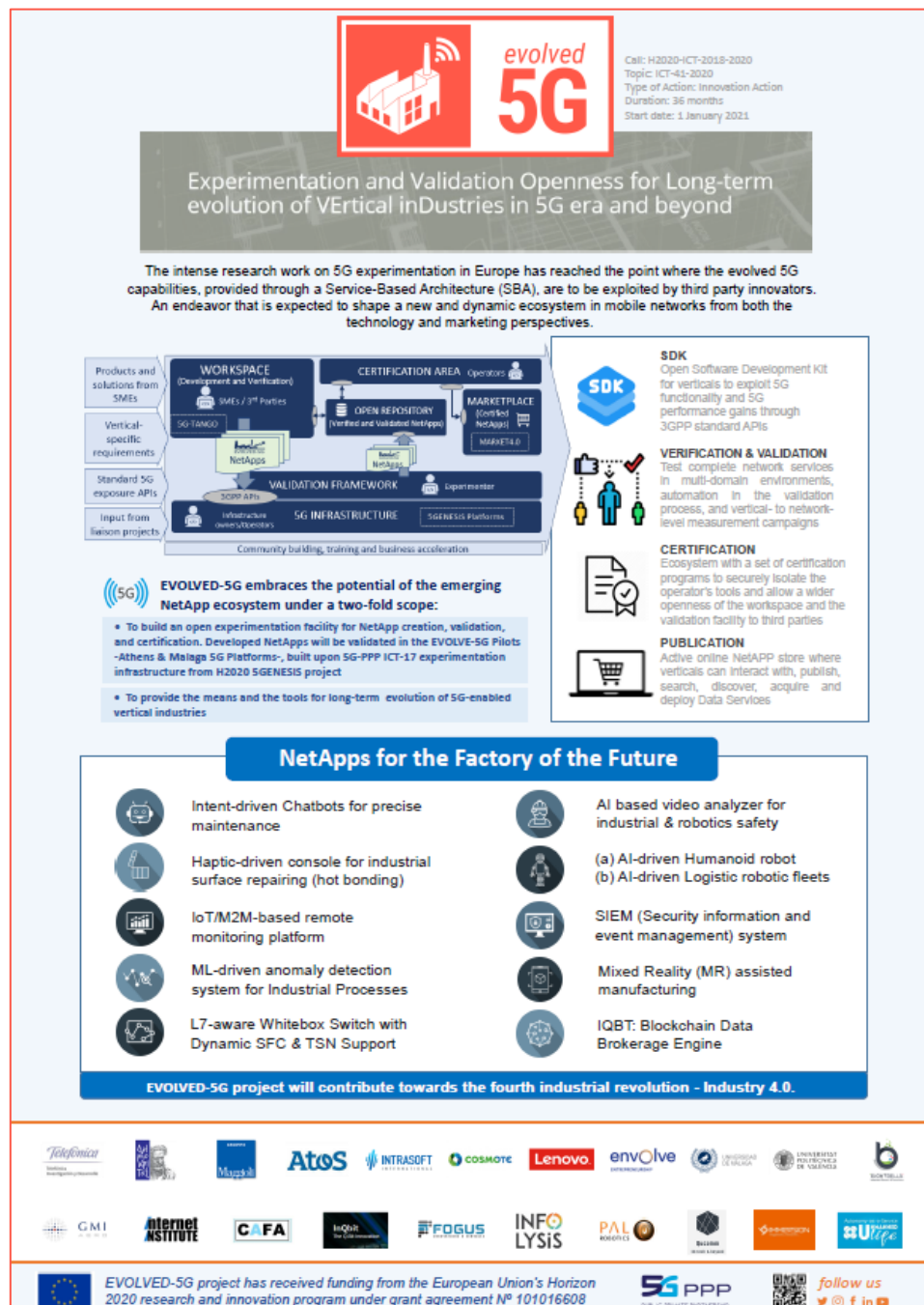


Figure 30 EVOLVED-5G poster

2.2 MEANS OF DISSEMINATION

2.2.1 Publications in journals

One of the most important methods for spreading scientific findings is publication in scientific journals with a wide impact. Publishing in the proper journals will increase the visibility of the EVOLVED-5G project among other 5G projects, making it more recognizable within the scientific and academic community and available to sophisticated distribution networks such as libraries, universities, and institutes. All the EVOLVED-5G publications can be found here: <https://evolved-5g.eu/dissemination/publications/>.

2.2.2 Publications in workshops and conferences

Partners with Research and Academia expertise are expected to exhibit scientific proficiency by publications in prestigious international conferences with acknowledgment to the EVOLVED-5G project. The publications in workshops and conferences are available here: <https://evolved-5g.eu/dissemination/publications/>.

2.2.3 Active participation in 5G-PPP activities

The EVOLVED-5G partners are aware of the 5G-PPP's contractual commitment as well as the organizational structure outlined in the GA and technical annex. They recognize the European Commission, the 5G-PPP partnership board, the 5G Infrastructure Association, and the 5G for Europe, as well as their roles and commitments, and all project partners pledge positive engagement with these bodies as part of EVOLVED-5G research and impact activities. More information can be found in Section 3 of this deliverable.

2.2.4 White Papers & 5G-PPP papers

In this section all the white papers and the contributions in 5GPPP publications are contained. At such publications, partners have the chance to promote and publish milestones of EVOLVED-5G project. All the white paper publications can easily be found here: <https://evolved-5g.eu/dissemination/publications/>.

2.2.5 Presentations in scientific events, conferences and forums

Presentations at scientific events and fora are an excellent way to get useful feedback from the targeted research and industrial community while also boosting the project's credibility. All the EVOLVED-5G presentations conducted by members of the consortium, can be found here: <https://evolved-5g.eu/dissemination/workshops-presentations-and-trials/>. So far, 28 presentations have taken place in the context of the EVOLVED-5G project.

2.2.6 Trials and Showcases

Trials and Showcases hosted by EVOLVED-5G partners are essential in attracting potential users and consumers, gathering relevant input, and facilitating communication between researchers and the market. All the trials conducted in the context of EVOLVED-5G projects are available here: <https://evolved-5g.eu/dissemination/workshops-presentations-and-trials/>, in the trials section.

2.2.7 Organization of events (workshops/seminars/webinars)

Workshops, seminars, and webinars are essential for guiding all key stakeholders through the project's Use Cases and findings, as well as providing training on the experimentation EVOLVED-5G platforms and the created NetApps Repository. All the organised/co-organised events of the project can be found in the workshops and special sessions section here: <https://evolved-5g.eu/dissemination/workshops-presentations-and-trials/>. Also, any interested partner may

learn more about EVOLVED-5G's upcoming events in the trainings (<https://evolved-5g.eu/community-accelerator/trainings/>) and courses (<https://evolved-5g.eu/community-accelerator/courses/>) tabs of the Community – Accelerator menu.

2.2.8 Exhibitions in industrial and scientific events

The project's presentation to a larger community, which includes professionals from industry, SMEs, academia, and audiences with technical interests, is a key focus area. EVOLVED-5G achieves this by participating in key industrial and scientific events. Reaching out to telecom operators, technology providers, content providers, service providers, energy providers, and manufacturers from various verticals will raise EVOLVED-5G's visibility and give to the project the opportunity to demonstrate its accomplishments by demonstrating its results and evaluating EVOLVED-5G Use Cases.

2.2.9 Academic and research community focused dissemination

EVOLVED-5G will share its major findings and solutions with the academic community, so that they can be used in research and teaching programs. The project's findings and know-how will be incorporated into future graduate and postgraduate courses, allowing the partner universities' curricula to be enhanced. Furthermore, this activity will have a significant impact, especially on M.Sc. and Ph.D. students, fostering the education of a new generation of European researchers/engineers working on the disciplines covered by EVOLVED-5G, and affecting a diverse emerging market.

2.3 MEANS OF MONITORING WP7 ACTIVITIES

Several monitoring methods have been enabled by EVOLVED-5G WP7 members (within the scope of T7.1) in order to continuously monitor and evaluate the effectiveness of EVOLVED-5G communication efforts during the project's lifetime, allowing corrective actions to be performed if needed. Such monitoring systems are vital since the project's objectives and targets must be met without deviations or underperformance. Furthermore, these tools ensure that the consortium members work together smoothly. The sections that follow, go into deeper level on those mechanisms.

2.3.1 MS-Teams Online Platform

The EVOLVED-5G partners use the Microsoft Teams platform as their primary online tool for sharing materials and content. This platform is essential to the consortium's members for the successful collaboration and alignment. More specifically, Microsoft Teams platform is divided into sub-sections (folders and sub-folders) to facilitate the organization and distribution of project materials across the members of the consortium. These sub-sections are dedicated to each Work Package and Task, and partners are regularly updating them. There's also the option of editing files online, which is particularly valuable for documenting communication and dissemination activities operations. A complete guide of the MS Teams platform has been thoroughly analyzed in the D7.1 Dissemination, Communication and 5G-PPP Engagement Plan”.

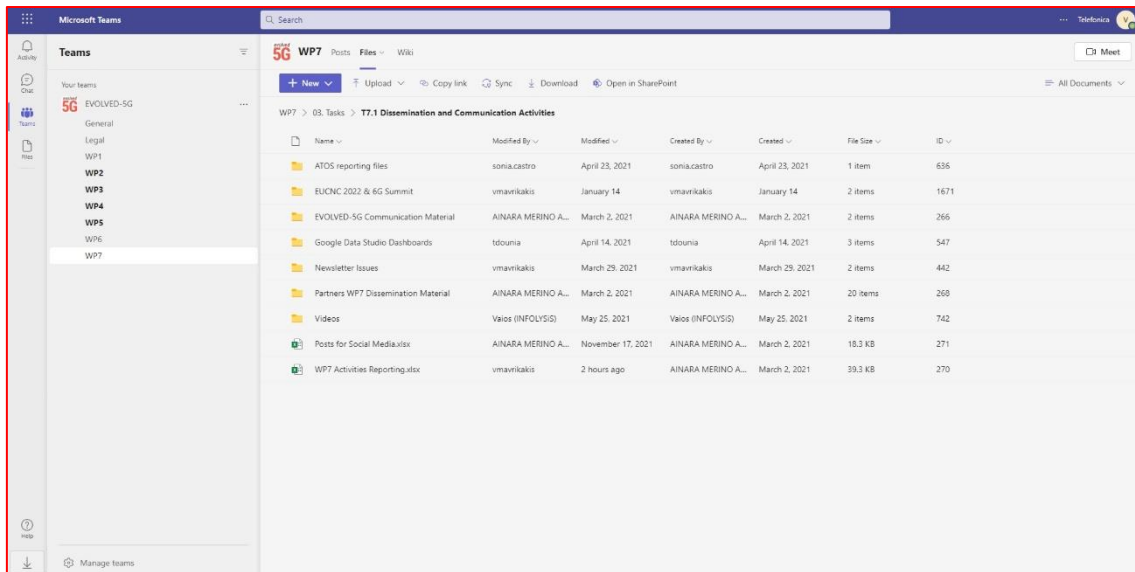


Figure 31: EVOLVED-5G MS Teams Environment

2.3.2 WP7 telcos

The WP7 telcos is an additional mean to track and monitor the status and the progress of the WP. At this work package the meetings take place on a monthly basis through the MS-Teams. The meetings take place the first Thursday of each month. At these meetings each task has dedicated slot to present and discuss the progress and all the issues related to each task. Furthermore, at the context of T7.1, apart from the status update, all partners are being informed about upcoming dissemination opportunities.

2.3.3 GA Meetings

The GA meetings is the most appropriate mean for meeting up all the project's partners and discuss all the related issues. In such meetings all partners participate and discuss on a higher level the issues and the progress of the project. At the era of COVID-19 these meetings were extremely useful as the physical meetings were not an option. Partners met virtually and coordinated the project without deviations. Up to this moment 6 meetings have taken place virtually and only one physically.

Table 3 EVOLVED-5G Meetings

Meeting	Dates	Type
Kick-off meeting	20-21/1/2021	Virtual
1 st GA plenary	14-15/4/2021	Virtual
2 nd GA plenary	6-7/7/2021	Virtual
3 rd GA Plenary	5-7/10/2021	Virtual
4 th GA Plenary	10-12/1/2022	Virtual
5 th GA Plenary	5-7/4/2022	Virtual
1 st Face-to-face Meeting	10-11/5/2022	Physical (Madrid, Spain)

2.3.4 Mailing lists

One additional mean that helps partners to communicate and coordinate the project is the mailing lists. Mailing lists have been created by coordination team and each work package has its own. Mailing lists is a very powerful tool as it gives the chance to send and receive mails to

specific partners without bombarding all the consortium with irrelevant mails. Also dedicated mailing lists are important in order to provide a continuous flow to the partners correspondence.

2.4 EVALUATION, STATISTICS AND IMPACT UNTIL M20

2.4.1 Dissemination and Communication Goals (M4-M20)

EVOLVED-5G dissemination activities will differ in intensity based on the progress of the project. In order to better monitor the intensity and set the corresponding goals per time period, the dissemination activities will be divided and carried out in two main time periods:

- First Time Period: M01 – M18
- Second Time Period: M19 – M36

The intensity will differ per phase and the initially set goals should reflect this differentiation. As a result, a split ratio percentage of 30/70 approximately will be used for setting the minimum planned goals per phase. Potential deviations between phases will be acceptable given the progress and achievements of the project, as well as the potential COVID-19 impact, but the final targets are to be met.

In the table below are depicted the proposed dissemination activities along with metric targets and timeline per period. Please note that these targets are considered tentative and might be updated as the project progresses and conditions change.

Table 4: EVOLVED-5G Dissemination KPIs

Planned Dissemination Activities	Metrics	Target (as per DoA)	Timeline (in Months)	1 st Period Target M01-M18	2 nd Period Target M19-M36
Publications in journals, workshops and conferences, articles	Number of publications	>20	M06-M36	>5	>15
Presentations in scientific events/conferences	Number of presentations	>20	M01-M36	>6	>14
Trials/Showcases	Number of showcases	>5	M19-M36	-	>5
Exhibitions in industrial and scientific events - Booths	Number of exhibitions/booths	>5	M12-M36	>1	>4
Organization of events (workshops/special sessions/seminars/training/poster sessions etc.)	Number of events	>10	M06-M36	>2	>8

2.4.2 Summary of Communication Achievements and Statistics (M1-M20)

2.4.2.1 Publications in Conferences and Journals

At this section of the deliverable any interested stakeholder may see all the publications of the EVOLVED-5G project with a short description about the authors, the event, the time or the publications journal. Where applicable there is available the respective DOI, or the status of the publication. Alternatively, all the publications are available in the EVOLVED-5G website here: <https://evolved-5g.eu/dissemination/publications/>. Up to now 6 publications in conferences and workshops have been accepted acknowledging EVOLVED-5G project.

Table 5: Publications in Conferences

#	Description	Link
1	Panos Matzakos (EURECOM, France); Harilaos Koumaras (NCSR Demokritos, Greece); Dimitris Tsolkas (Fogus Innovations and Services, Greece); Maria Christopoulou and George K Xilouris (NCSR Demokritos, Greece); Florian Kaltenberger (Eurecom, France), An open source 5G experimentation testbed, IEEE MeditCom, September 2021,	https://doi.org/10.1109/MeditCom49071.2021.9647647
2	Dimitrios Fragkos and Georgios Makropoulos (NCSR Demokritos, Greece); Panteleimon Sarantos (NCSR Demokritos, Greece); Harilaos Koumaras (NCSR Demokritos, Greece); Anastasios-Stavros Charismiadis (National and Kapodistrian University of Athens, Greece); Dimitris Tsolkas (Fogus Innovations and Services, Greece), 5G Vertical Application Enablers Implementation Challenges and Perspectives, IEEE MeditCom, September 2021	https://doi.org/10.1109/MeditCom49071.2021.9647460
3	Cedric Kervegant (IMMERSION), Julien Castet (IMMERSION), Juliette Vauchez (IMMERSION), Charles Bailly (IMMERSION) Distant Assist Cursor (DAC): Designing an Augmented Reality System to Facilitate Remote Collaboration for Novice Users, ACM ISS 2021, November 2021	https://doi.org/10.1145/3447932.3490520
4	Alejandro Molina Sanchez (TELEFONICA), Anastasios-Stavros Charismiadis (FOGUS Innovations and Services), Dimitris Tsolkas (FOGUS Innovations and Services), David Artuñedo Guillen (TELEFONICA), Javier Garcia Rodrigo (TELEFONICA), "Offering the 3GPP Common API Framework as Microservice to Vertical Industries" EuCNC & 6G Summit 2022, June 2022	https://doi.org/10.1109/EuCNC/6GSummit5494.1.2022.9815741
5	D. Fragkos (NCSR Demokritos), G. Makropoulos (NCSR Demokritos), A. Gogos (NCSR Demokritos), H. Koumaras (NCSR Demokritos), A. Kaloxylas (University of Peloponnese), "NEFSim: An open experimentation framework utilizing 3GPP's exposure services", EuCNC & 6G Summit 2022, June 2022	https://doi.org/10.1109/EuCNC/6GSummit5494.1.2022.9815829
6	H. Koumaras, (NCSR Demokritos), D. Tsolkas (FOGUS Innovations and Services), J. Garcia (TELEFONICA), D. Artunedo (TELEFONICA), B. Garcia (University of Malaga), R. Marco (ATOS), A. Salkintzis (LENOVO), D. Fragkos (NCSR Demokritos), G. Makropoulos (NCSR Demokritos), F. Setaki (COSMOTE), A. Diaz (University of Malaga), P. Merino (University of Malaga), V. Koumaras (INFOLYSIS), P. Encinar (ATOS), Y. Karadimas (MAGGIOLI), "A network programmability framework for	https://doi.org/10.1109/EuCNC/6GSummit5494.1.2022.9815790

vertical applications in the beyond 5G era” EuCNC & 6G Summit 2022, June 2022,	
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Apart from conference publications in the same webpage with the conference-workshop publications which is mentioned above, any interested stakeholder may notice also the publications in journals. Up to the moment of the release of the deliverable one publication in journal papers has been submitted.

Table 6 Publications in Journals

#	Description	Link
1	Francisco Luque-Schempp (UMA), Laura Panizo (UMA), María-del-Mar Gallardo (UMA), Pedro Merino (UMA) and Javier Rivas (UMA) “Towards Zero Touch Configuration of 5G Non-Public Networks for Time Sensitive Networking”. Accepted In IEEE Network Magazine (Volume: 36, Issue: 2), Special issue: New Network Architectures, Protocols and Algorithms for the Time-Sensitive Applications, 30 May 2022	10.1109/MNET.006.2100442

2.4.2.2 General Publications in Magazines, Books, Newspapers, Websites

This section cites the general publications of the EVOLVED-5G project. With the term “General Publications” we mean white papers (<https://evolved-5g.eu/dissemination/publications/>), articles (<https://evolved-5g.eu/dissemination/articles/>) and press releases (<https://evolved-5g.eu/dissemination/press-releases/>) related to the project. The following tables provide the reader of the deliverable with a short description of the activity like the title, the timeline and the authors along with the equivalent link of the publication. Concerning the general publications, EVOLVED-5G project has 30 in total (5 5G-PPP related publications, 10 online articles, 14 press releases and 1 book chapter).

Table 7: EVOLVED-5G White Papers

#	Description	Link
1	5GPPP, The European 5G Annual Journal 2021, May 2021	https://bit.ly/3PTOIB6
2	5GPPP, Phase 3 Projects Brochure, June 2021	https://5g-ppp.eu/wp-content/uploads/2021/06/5GPPP_Phase3_Brochure_v7.2-web.pdf
3	5G IA, ‘European Vision for the 6G Network Ecosystem’, June 2021	https://5g-ppp.eu/wp-content/uploads/2021/06/WhitePaper-6G-Europe.pdf
4	5GPPP, ‘5G Ecosystems’, 5G Infrastructure Association Vision and Societal Challenges Working Group Business Validation, Models, and Ecosystems Sub-Group, September 2021	https://5g-ppp.eu/wp-content/uploads/2021/09/White_paper_5G-Ecosystems_1-0-final.pdf
5	5GPPP, ‘View on 5G Architecture V4.0’, November 2021	https://5g-ppp.eu/wp-content/uploads/2021/11/Architecture-WP-V4.0-final.pdf

Table 8: EVOLVED-5G Articles

#	Description	Link
1	CORDIS EU research results, "Making strides towards an open and dynamic 5G ecosystem"	https://cordis.europa.eu/article/id/435466-making-strides-towards-an-open-and-dynamic-5g-ecosystem
2	5GPPP, "EVOLVED-5G builds the first 3GPP NEF Emulator to support SMEs on 5G programmability"	https://5g-ppp.eu/evolved-5g-builds-the-first-3gpp-nef-emulator-to-support-smes-on-5g-programmability/
3	Unmanned Life, "Unmanned Life Hits The Factories Of The Future (FoF) Market"	https://unmanned.life/2021/07/unmanned-life-hits-the-factories-of-the-future-fof-market/
4	upv.es (in Spanish), "The European project in which the UPV participates aims to achieve the industrial revolution of the 21st century with smart factories."	http://www.upv.es/noticias-upv/noticia-12983-evolved-5g-es.html?fbclid=IwAR3AiO073hsjB5pSTji9HtxQ-nrjbZzNn4Zb9rxRe133crl0jX39AitQl2k
5	Capital.gr (in Greek) EVOLVED-5G: NCSR "Demokritos" develops 5G for vertical industries	https://www.capital.gr/epixeiriseis/3542068/evolved-5g-to-ekefe-dimokritos-exelissei-to-5g-gia-tis-kathetes-biomixanies
6	Startupper Magazine (in Greek), Dr. Harilaos Koumaras	https://evolved-5g.eu/wp-content/uploads/2021/03/startupper-NCSR.pdf
7	5GPPP, EVOLVED-5G announces the first release (Release 1.0) of the 3GPP CAPIF Core Function,	https://5g-ppp.eu/evolved-5g-announces-the-first-release-release-1-0-of-the-3gpp-capif-core-function/
8	5gforum.es, "THE 5G REVOLUTION IN CONNECTED MOBILITY AND INDUSTRY 4.0, AT THE FOURTH DAY OF THE 5G FORUM"	https://www.5gforum.es/en/la-revolucion-del-5g-en-la-movilidad-conectada-y-la-industria-4-0-en-la-cuarta-jornada-del-5g-forum/
9	aviationweek.com, "How 5G Connectivity Could Make Aircraft Composite Repairs More Efficient"	https://aviationweek.com/mro/emerging-technologies/how-5g-connectivity-could-make-aircraft-composite-repairs-more-efficient
10	xrtoday.com, "EU's EVOLVED-5G Project to Back Open XR Networks"	https://www.xrtoday.com/mixed-reality/eus-evolved-5g-project-to-back-open-xr-networks/

Table 9: Press Releases table

#	Description	Link
1	EVOLVED-5G announced at NCSR "Demokritos" website	https://www.iit.demokritos.gr/projects/experimentation-and-validation-openness-for-long-term-evolution-of-vertical-industries-in-5g-era-and-beyond/
2	EVOLVED-5G announced at 8Bells website	https://www.8bellsresearch.com/projects/h2020-5gppp-evolved-5g/

3	EVOLVED-5G announced at 5G-PPP website	https://5g-ppp.eu/evolved-5g/
4	EVOLVED-5G announced at GMI-Aero website website	https://www.gmi-aero.com/en/research-and-development/evolved-5g-horizon-2020-11.html
5	GMI AERO, EVOLVED-5G partner, released a press release sharing details about EVOLVED-5G project	https://www.gmi-aero.com/fr/actualites/evolved-5g-ue-research-project-40.html
6	EVOLVED-5G announced at PAL Robotics website	https://pal-robotics.com/collaborative-projects/evolved-5g/
7	EVOLVED-5G announced at engineere.com website	https://www.engineere.com/BE/Brussels/105907084735745/EVOLVED-5G
8	EVOLVED-5G announced at IMMERSION website	http://www.immersion.fr/en/evolved-5g/
9	EVOLVED-5G announced at: MAGGIOLI website	https://www.maggioli.com/it-it/settori/ricerca-sviluppo
10	EVOLVED-5G announced at UMA portal	http://www.morse.uma.es/node/1285
11	EVOLVED-5G announced at QUCOMM website	https://qucomm.eu/h2020-5gppp-evolved-5g-experimentation-and-validation-openness-for-long-term-evolution-of-vertical-industries-in-5g-era-and-beyond/
12	EVOLVED-5G announced at COSMOTE website	https://www.cosmote.gr/cs/otegroup/en/evolved_5g.html
13	EVOLVED-5G announced at CAFA Tech website here	https://www.cafatech.com/evolved-5g/
14	EVOLVED-5G announced at Edukad website	https://edukad.etag.ee/project/4582?lang=en

Table 10: Book Chapters

#	Authors	Description	Link
1	Tsolkas D., Charismiadis A.S Department of Informatics & Telecommunications, National and Kapodistrian University of Athens), Koumaras H., Foteas A. (NCSR “Demokritos”, Institute of Informatics and Telecommunications)	Artificial Intelligence in 5G and Beyond Networks Chapter No4 in Pethuru Raj Chelliah, G. Nagarajan, R.I. Minu Applied Edge AI Concepts, Platforms, and Industry Use Cases, Taylor & Francis Group, 1st Edition, April 2022,	https://doi.org/10.1201/9781003145158

2.4.2.3 Presentations

Presentations is, maybe, the most common mean for disseminating and promoting EVOLVED-5G oriented material to the broadest possible audience. Table 11 below gives all the related information regarding the EVOLVED-5G presentation. These 3 separate columns give details about the event where each presentation took place, the date and the location and of course the title of the presentation. Alternatively, the EVOLVED-5G's presentations can be found online here: <https://evolved-5g.eu/dissemination/workshops-presentations-and-trials/>. Up to now, consortium members have delivered 27 presentations.

Table 11: EVOLVED-5G Presentations

#	Event	Date/Location	Title
1	5GPPP Webinar	5 March 2021 (virtual)	"5G Innovations for Verticals"
2	European Robotics Forum	13-15 April 2021 (virtual)	PAL Robotics in "How to make an impact in EU projects"
3	5GPPP Arch Working Group	30 April 2021 (virtual)	FOGUS, presented the EVOLVED-5G project and shared some very useful details about its pillars and its objectives
4	5GPPP TB Workshop	24 June 2021 (virtual)	Dimitris Tsolkas – EVOLVED-5G 5GPPP TB workshop 5G for verticals session
5	IEEE MeditCom 2021	7-10 September 2021 (hybrid)	Presentation of the Conference paper entitled "5G Vertical Application Enablers Implementation Challenges and Perspectives" by NCSR
6	IEEE MeditCom 2021	7-10 September 2021 (hybrid)	Presentation of the Conference paper entitled "An open source 5G experimentation testbed" by NCSR
7	5G-PPP Software Networks WG	16 September 2021	Regel G. Usach – UPV, EVOLVED-5G project presentation
8	5G-PPP TMV WG	2 November 2021	Harilaos Koumaras Technical Manager -NCSR EVOLVED-5G project presentation
9	ACM ISS 2021	14 November 2021	IMMERSION, EVOLVED-5G poster session in the context of conference paper entitled "Distant Assist Cursor (DAC): Designing an Augmented Reality System to Facilitate Remote Collaboration for Novice Users"
10	Smart City Expo World Congress	18 November 2021	Tanel Järvet – CAFA Tech participated in a panel discussion, Moderated by the TalTech – Tallinn University of Technology Smart City Centre of Excellence and featuring CAFA Tech, Fyma and Envelope, where aspects and results of the EVOLVED-5G project and its use cases were also discussed and presented.
11	Smart City Expo World Congress	18 November 2021	Tanel Järvet – CAFA Tech EVOLVED 5G project and CAFA Worker Robot

			introduction during Nordic Pavilion session
12	5GTechritory 2021	22 November 2021	Harilaos Koumaras (NCSR D) – EVOLVED-5G NetApp environment and 5G flexibility
13	InfoCom World 2021	26 November 2021	Fofy Setaki (Cosmote) – “EVOLVED-5G: The NetApps Certification Framework” Presentation
14	25th Seminar on Radio Communication	2-4 February 2022	Rudolf Susnik, Janez Sterle, Luka Korsic – ININ presented the ININ’s NetApp “Industrial grade 5G connectivity for the Factory of the Future IoT devices” developed within EVOLVED-5G
15	5G Programmability Joint Workshop by EVOLVED-5G project and the Computer Science department of Athens Metropolitan College	21 & 22 March 2022	-Dimitrios Fragkos, NCSR D “5G Programmability and APIs Exposure -George Makropoulos, NCSR D “The NetApp concept, design and implementation principles” -Dr Dimitrios Tsolkas, FOGUS “NetApp Lifecycle and Different Development Environments: The EVOLVED-5G Ecosystem”.
16	EVOLVED-5G and TIAGo robot for Industry 4.0, Advanced Factories 2022	29-31 March 2022	PAL Robotics, EVOLVED-5G partner, introduced through their booth the way TIAGo robot is used in the project with the aim to contribute towards the Industry 4.0.
17	2nd IFIP/IEEE International Workshop on Fully-Flexible Internet Architectures and Protocols for the Next-Generation Tactile Internet	29 April 2022	"Implementation and evaluation of the Multi-connection Tactile Internet Protocol and API" conference paper presentation by UMA
18	“EVOLVED-5G CAPIF core function” at 5G FORUM 2022	12 May 2022	Telefonica partner presented “EVOLVED-5G CAPIF core function”, along with other 5G uses cases that is implementing with UMA in Málaga
19	“EVOLVED-5G NetApp ecosystem, 5G programmability and the NetApp lifecycle” at 5G FORUM 2022	12 May 2022	“EVOLVED-5G NetApp ecosystem, 5G programmability and the NetApp lifecycle” by UMA
20	“EVOLVED-5G agricultural use case and NetApp” at 5G FORUM 2022	12 May 2022	UMA partner presented “EVOLVED-5G agricultural use case and NetApp” to demonstrate that EVOLVED-5G activities go even beyond i4.0.
21	1st Open Annual Workshop on Future ICT organised by 8BELLS	25 May 2022	“5G programmability and development of Network Applications (NetApps)” by Harilaos Koumaras (NCSR Demokritos)

22	EVOLVED-5G presentation on NetApp for Verticals Session in EuCNC 2022	8 June 2022	Harilaos Koumaras EVOLVED-5G technical manager presented the nature and the NetApp architecture of the EVOLVED-5G in the NetApp for Verticals Session of EuCNC 2022
23	"NEFSim: An Open Experimentation Framework Utilizing 3GPP's Exposure Services" conference paper presentation in EuCNC 2022	8 June 2022	Harilaos Koumaras EVOLVED-5G technical manager presented the conference paper entitled "NEFSim: An Open Experimentation Framework Utilizing 3GPP's Exposure Services" by NCSR.
24	"Offering the 3GPP Common API Framework as Microservice to Vertical Industries" conference paper presentation in EuCNC 2022	9 June 2022	Alejandro Molina Sanchez from Telefonica presented the EVOLVED-5G conference paper entitled "Offering the 3GPP Common API Framework as Microservice to Vertical Industries" by Telefonica & FOGUS.
25	"Network Programmability Framework for Vertical Applications in the Beyond 5G Era" conference paper presentation in EuCNC 2022	9 June 2022	Harilaos Koumaras EVOLVED-5G technical manager presented the conference paper entitled "Network Programmability Framework for Vertical Applications in the Beyond 5G Era" by NCSR, ATOS, FOGUS, INFOLYSIS, LENOVO and MAGGIOLI
26	"Implementation and evaluation of the Multi-connection Tactile Internet Protocol and API" presentation	14-17 June	Delia Rico presented Implementation and evaluation of the Multi-connection Tactile Internet Protocol and API. „In las Jornadas de Concurrencia y Sistemas Distribuidos 2022", Ávila, España at National Spanish Conference.
27	"Towards Zero Touch Configuration of 5G Non-Public Networks for Time Sensitive Networking"	14-17 June	Laura Panizo presented "Towards Zero Touch Configuration of 5G Non-Public Networks for Time Sensitive Networking" in the "Jornadas de Concurrencia y Sistemas Distribuidos" National Spanish Conference

2.4.2.4 Workshops and Special Sessions organized/co-organized by EVOLVED-5G

Table 12 provides all the related information about the Workshops and Special Sessions organized/co-organized by EVOLVED-5G. Any interested reader may find information about the event type, the date, the location and a short description about it. Alternatively, you can find more information here: <https://evolved-5g.eu/dissemination/workshops-presentations-and-trials/> in the Workshops & Special Sessions section. At this point, it is important to clarify that at this section we have included only activities under the scope of WP7 and not of WP6. Information about WP6 activities can be found in WP6 deliverable or in the respective webpages of the website. So far EVOLVED-5G project has co-organised 2 special sessions in two different events.

Table 12: EVOLVED-5G Special Sessions and Workshops co-organised

#	Event	Date/ Location	Description
1	5G FORUM	12 May 2022	EVOLVED-5G Special Session at 5G FORUM “EVOLVED-5G & 5G USE CASES INNOVATION”
2	17 th International Conference on Availability, Reliability and Security (ARES 2022)	23 – 26 August	2 nd International project Workshop on Advances on Privacy Preserving Technologies and Solutions co-organised by EVOLVED-5G

2.4.2.5 Other Activities-Events

At this subchapter, each reader may find a dedicated table that summarizes all activities that do not belong to the aforementioned categories, such as poster sessions, booths and early-stage demonstrations and panel discussions. In total, EVOLVED-5G project has participated in 5 related activities.

Table 13: EVOLVED-5G participation in other events

#	Activity	Date/ Location	Description
1	Poster Session	14 November 2021	https://dl.acm.org/doi/10.1145/3447932.3490520
2	Booth/ Demonstration	16-18 November 2021/ Smart City Expo World Congress	CAFA Tech participated in the Estonian Joint Stand at the Smart City Expo World Congress in Barcelona. CAFA Tech presented the CAFA Worker robot and the 5G cellular drone at the fair and introducing Evolved 5G project and projects results.
3	Panel Discussion	16-18 November 2021/ Smart City Expo World Congress	Tanel Järvet (CAFA) participated in a panel discussion, Moderated by the TalTech – Tallinn University of Technology Smart City Centre of Excellence and featuring CAFA Tech, Fyma and Envelope, during the Smart City Expo World Congress where aspects and results of the EVOLVED-5G project and its use cases were discussed and presented.
4	Booth	29 -31 March 2022/ Advanced Factories 2022	At the ADVANCED FACTORIES 2022 congress that focuses on industry 4.0, PAL Robotcs, EVOLVED-5G partner, through their booth had the chance to introduce to visitors to EVOLVED-5G Project through the TIAGo robot which is used in the project with the aim to contribute towards the Industry 4.0.
5	Booth/ Demonstration	21-24 June 2022/ Automatica 2022	PAL Robotic's Booththrough their booth demonstrated the project's overview and how it will try to bring the transition to industry 4.0.

6	Booth/ Demonstration	28-30 June 2022/ ERF 2022	Visitors got to learn about EVOLVED-5G Project, which uses TIAGo robot with the aims to contribute towards the Industry 4.0., by upgrading the 5G experimentation potential in Europe, materializing the openness of 5G to vertical industries, to industrial mobile robots and much more.
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Table below summarises the Dissemination activities performed and confirmed at the time this deliverable was under final editing.

Table 14: Current Status of the Dissemination plan

Planned Dissemination Activities	Metrics	Target (as per DoA)	Timeline (in Months)	1 st Period Target M01- M18	Period Status (M1-M18)
Publications in journals, workshops and conferences, articles	Number of publications	>20	M06-M36	>5	7 publications
Presentations in scientific events/conferences	Number of presentations	>20	M01-M36	>6	27 presentations
Trials/Showcases	Number of showcases	>5	M19-M36	-	(valid for the second period)
Exhibitions in industrial and scientific events - Booths	Number of exhibitions/booths	>5	M12-M36	>1	6 event
Organization of events (workshops/special sessions/seminars/training/poster sessions etc.)	Number of events	>10	M06-M36	>2	2 Special Sessions/workshops and 2 Training Sessions (in the context of WP6)

As it can be clearly observed, during the first reporting period, EVOLVED-5G consortium was very active reaching all agreed KPIs without deviations despite the COVID-19 situation. In terms of presentations, the consortium has managed to reach the KPIs goal for the whole project. Concerning the trials and showcases there is no activity, since this is an activity which starts on July 2022 when the first technical advancements are available. At all the other dissemination categories, EVOLVED-5G consortium will continue to work towards the direction of achieving all the set KPIs.

2.4.3 Summary of Dissemination Achievements (M1 -M20)

The table below summarises the communication activities and impact during the current reporting period (please note the website and social media statistics refer to the period M1-M18).

Table 15: EVOLVED-5G Communication Summary

Activity during M1-M20	M1-M20 Achievements
Communication channels used	1 website 5 Social Media Channels
Total Number of News posted in Website (News webpage)	89 new posts
Total Dissemination Activities communicated through the EVOLVED-5G Website (until early July)	72 reported activities
Total website unique visitors	798 visitors
Total website hits	6.139 hits
Total website sessions	1.117 session
Total Number of Posts in Social Media channels	760 posts (LinkedIn: 177, Twitter 225, Facebook 177, Instagram 174)
Total Number of Followers in Social Media channels	985 followers (LinkedIn: 421, Twitter 346, Facebook 95, Instagram 123)
YouTube channel	3 videos
YouTube subscribers	47 subscribers
YouTube views	270 views
Newsletter issues published	6 issues
Leaflets	1 Leaflet version (A4 two-fold)
Posters	1 Poster version (A1)
Stickers	300 stickers

2.4.4 Website Performance, Statistics and Dashboards

The EVOLVED-5G website is the basic mean of the digital presence of the project. It can be seen as a news portal, where any interested visitor can learn the latest news about project-oriented activities, but also as an online portal where everyone can navigate through different project material such as publications and activities and redirect to different project links such as the library and the marketplace. That is why, it is of utmost importance to track, monitor and evaluate the website's activity. For this purpose, Google Analytics and Google Data Studio are utilized to depict the website's activity in the most comprehensive and understandable way (more details on the statistical tools used also available in D7.1).

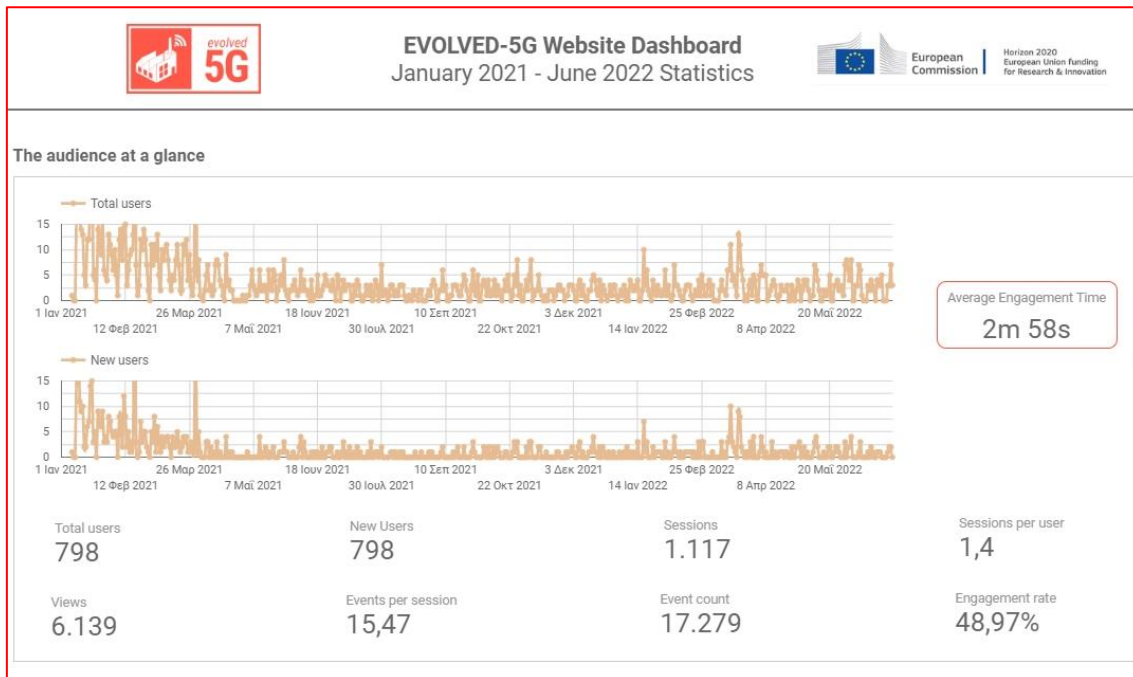


Figure 32: EVOLVED-5G Website Dashboard

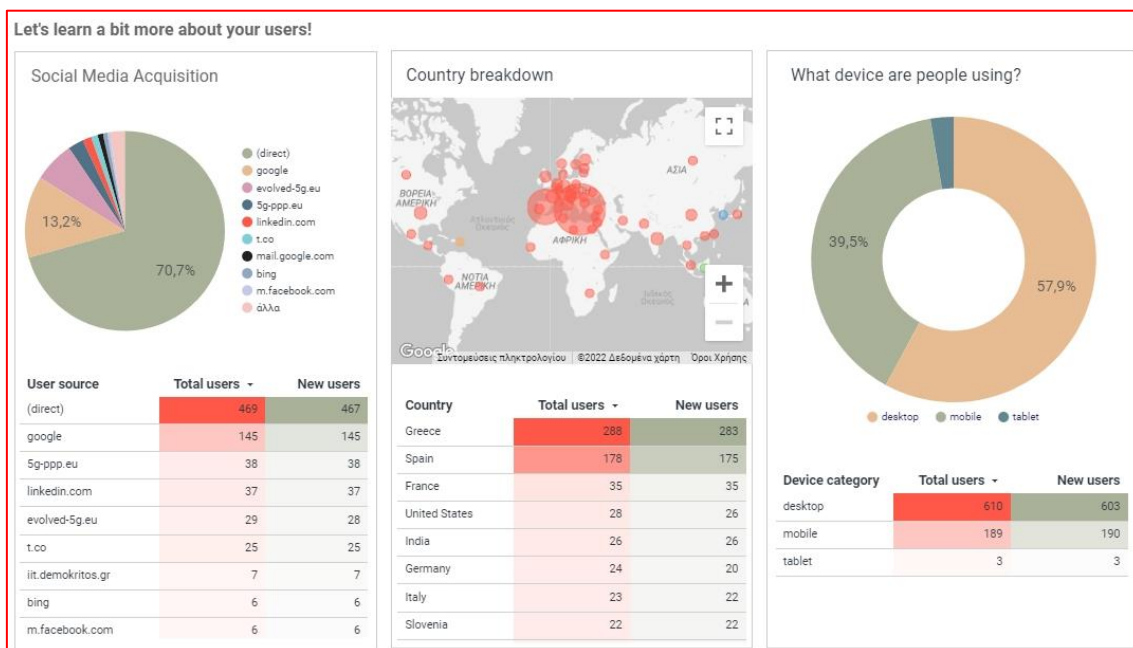


Figure 33: EVOLVED-5G Website Dashboard

Please note that at the time of the final editing of this deliverable, the website statistics of the period M1-M18 (Jan 2021-June 2022) have been analysed and presented in this section.

Figure 32 and Figure 33 refer to the website's Dashboards. As it can be clearly seen, the website dashboard is divided into two different sections. The first one is consisted of 2 infographics showing the total new users. At this section any interested reader can also retrieve information about the number of sessions (1117), the engagement rate (48,97%), the number of views (6139), as well as the average engagement time (2m 58s). On the second section of the website's dashboard, any interested stakeholder is able to see details about how we acquired our visitors, some demographic information and also, about the device that visitors used in order to reach the project's website. For Instance, most of the visitors (70,7%) came directly to the website, while Greece is the country with the most visitors. Finally, the most popular device is the desktop, with the mobile phones and tablets to follow.

Apart from the Google Dashboards for the website, we use also insights (Figure 34 & Figure 35) directly from the Google Analytics to supplement the website's activity and better monitor website's performance. At the following figures information about the users, the user's acquisition, the user activity within the website and the most popular webpages and events can be obtained.

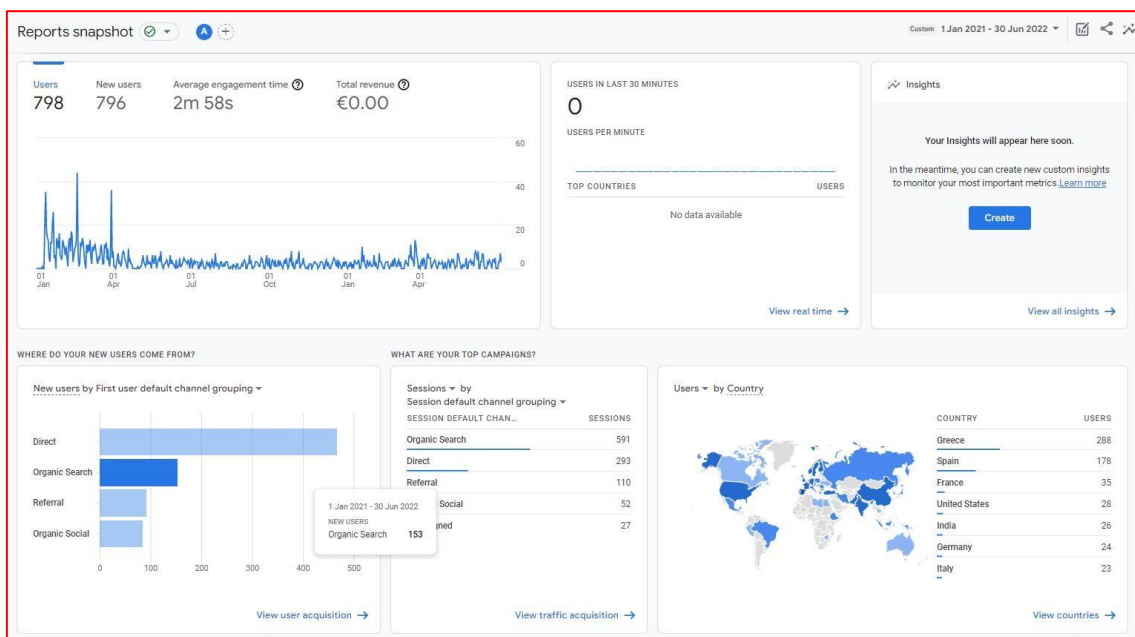


Figure 34: EVOLVED-5G Google Analytics

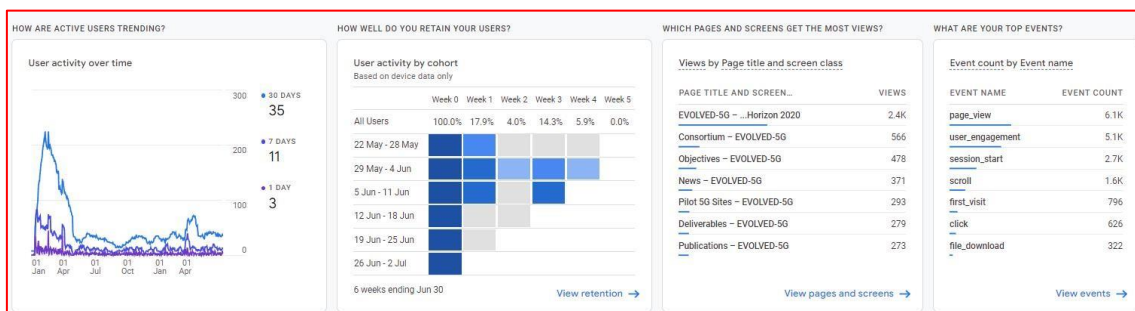


Figure 35: EVOLVED-5G Google Analytics

The EVOLVED-5G website statistical dashboard is also available online at <https://datastudio.google.com/reporting/ace585aa-271f-4d0e-9be5-70548ad6b3a1>

2.4.5 Social Media Performance, Statistics and Dashboards

Besides website, statistical dashboards have been prepared for each social media separately. Each dashboard is divided in different sections. There is an infographic part which depicts information about post views and a dropdown list where the visitor can browse in different posts of the recorded period. On the right side of each dashboard, we have included period and total statistics. The dashboards are being issued on a quarterly basis or per request for special occasions and periods like this deliverable. Social media dashboards are accompanied with dedicated charts with the total followers and posts flow.

Please note that at the time of the final editing of this deliverable, the social media statistics of the period M1-M18 (Jan 2021-June 2022) have been analysed and presented in this section.

EVOLVED-5G LinkedIn statistics are presented in Figure 36 where details about the views per post/date activity, the dropdown list with all the posts of the period are presented. Also, we can see on the statistics part, that for the recorded period 184 posts have been made, acquiring 2.611 likes, 77.609 post views and 395 connections.

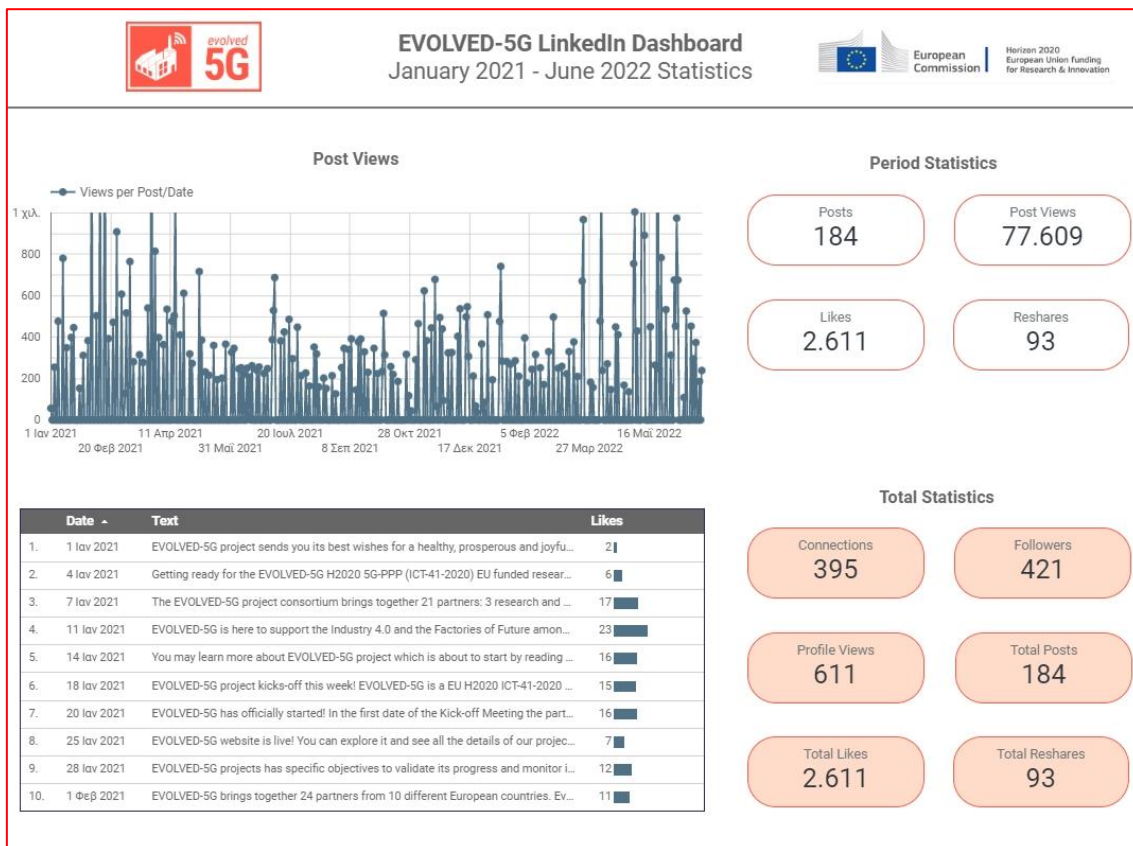


Figure 36: EVOLVED-5G LinkedIn Dashboard

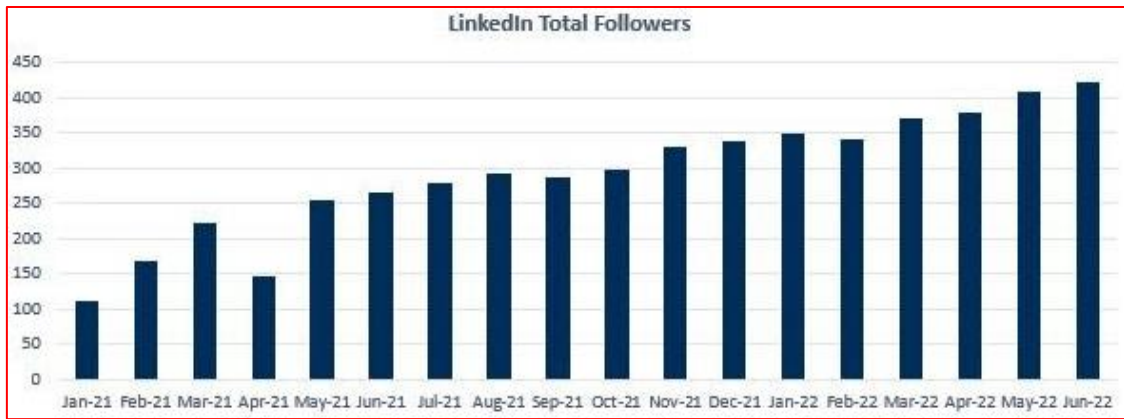


Figure 37: EVOLVED-5G LinkedIn Total Followers Chart

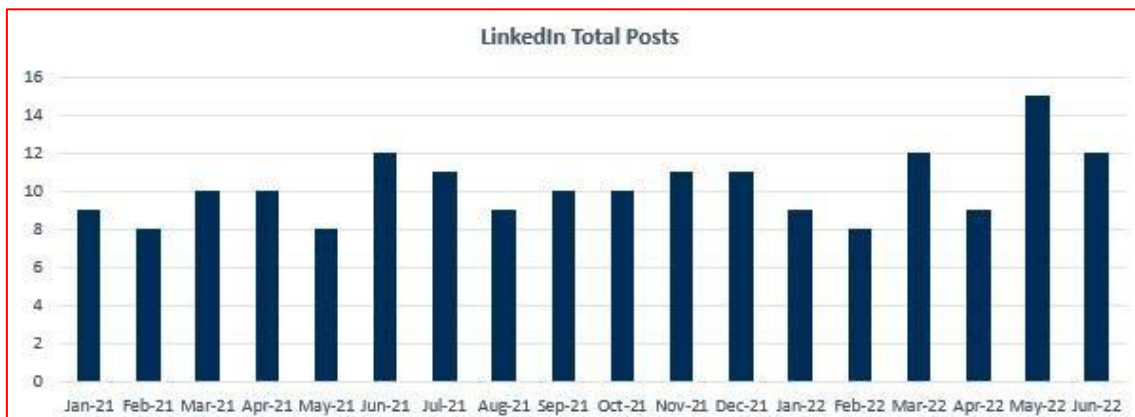


Figure 38: EVOLVED-5G LinkedIn Total Post Chart

Figure 37 and Figure 38 show both the total followers and the number of posts per month (as evolving during the period Jan 2021-June 2022). More specifically, regarding the number of followers, a positive rate of change is noted except from specific fluctuations, indicating a continuous increase of the EVOLVED-5G broader community. On the other hand, the number of posts for the LinkedIn account ranges around an average of 9 posts per month. However, it can be observed that the number of posts varies between project months, due to variation in the type and the availability of activities.

The EVOLVED-5G LinkedIn statistical dashboard is also available online at <https://datastudio.google.com/reporting/ded4c186-2f6d-499b-bbba-1d1a76e0dc13>

In Figure 39 the **Twitter Dashboard** is presented. As it can be clearly seen it follows the same design pattern as it has been described previously.

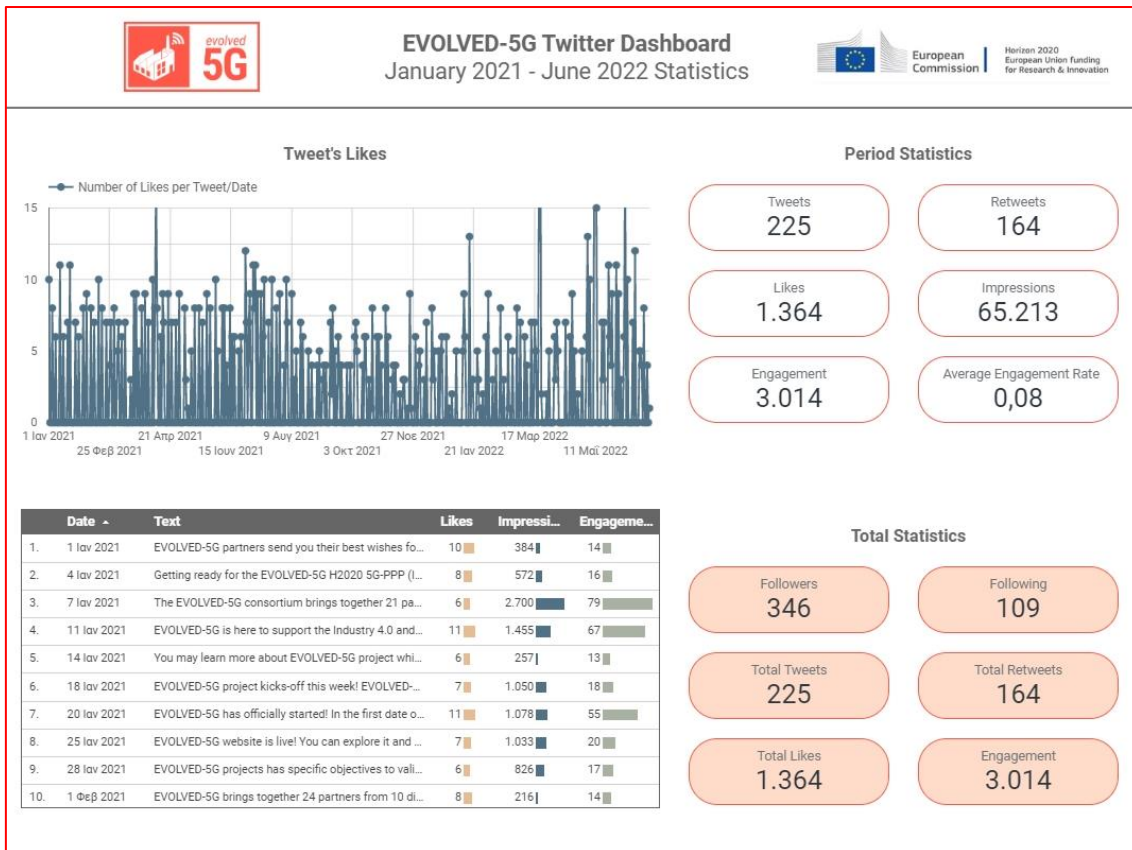


Figure 39: EVOLVED-5G Twitter Dashboard

For this reported period the Twitter channel was very active as 225 tweets have been made and 1.364 likes have been acquired. Furthermore, the EVOLVED-5G Twitter channel has acquired 346 followers and 3.014 engagements.

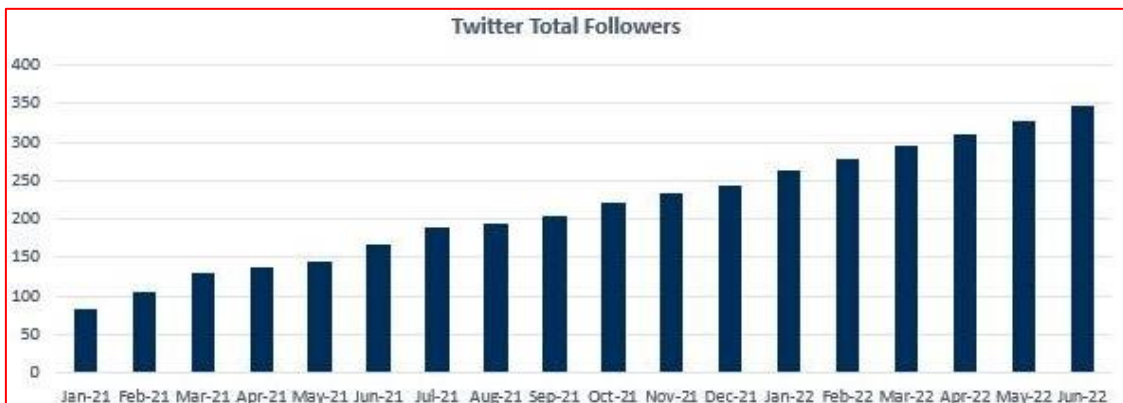


Figure 40: EVOLVED-5G Twitter Total Followers Charts

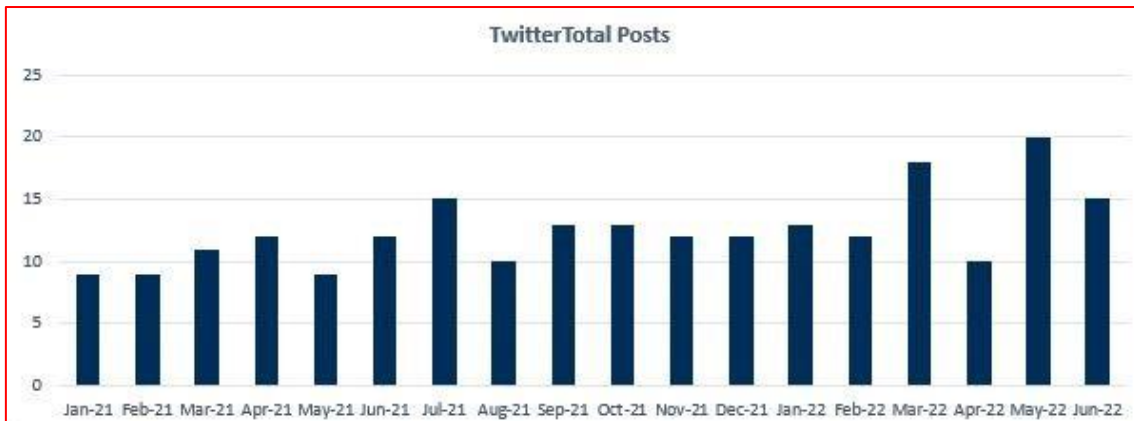


Figure 41: EVOLVED-5G Total Twitter Posts Charts

The EVOLVED-5G Twitter account follows a similar course as the LinkedIn one. More specifically, the number of followers continues to systematically increase each month building a significant loyal Twitter community (Figure 40). On the other hand, the number of posts varies between different months according to the activities that have been completed during specific periods. (Figure 41).

The EVOLVED-5G Twitter statistical dashboard is also available online at <https://datastudio.google.com/reporting/c9462167-83e2-4aa4-8524-2dbfdd26fe8b>

Figure 42 presents the **Facebook dashboard**. In total 177 posts have been made through this social media channel with 1.156 likes. Also 95 have liked our Facebook page with 9.198 total number of impressions and 1.550 number of engagements. Since the beginning of the project a total amount of 7.533 reach has been achieved.

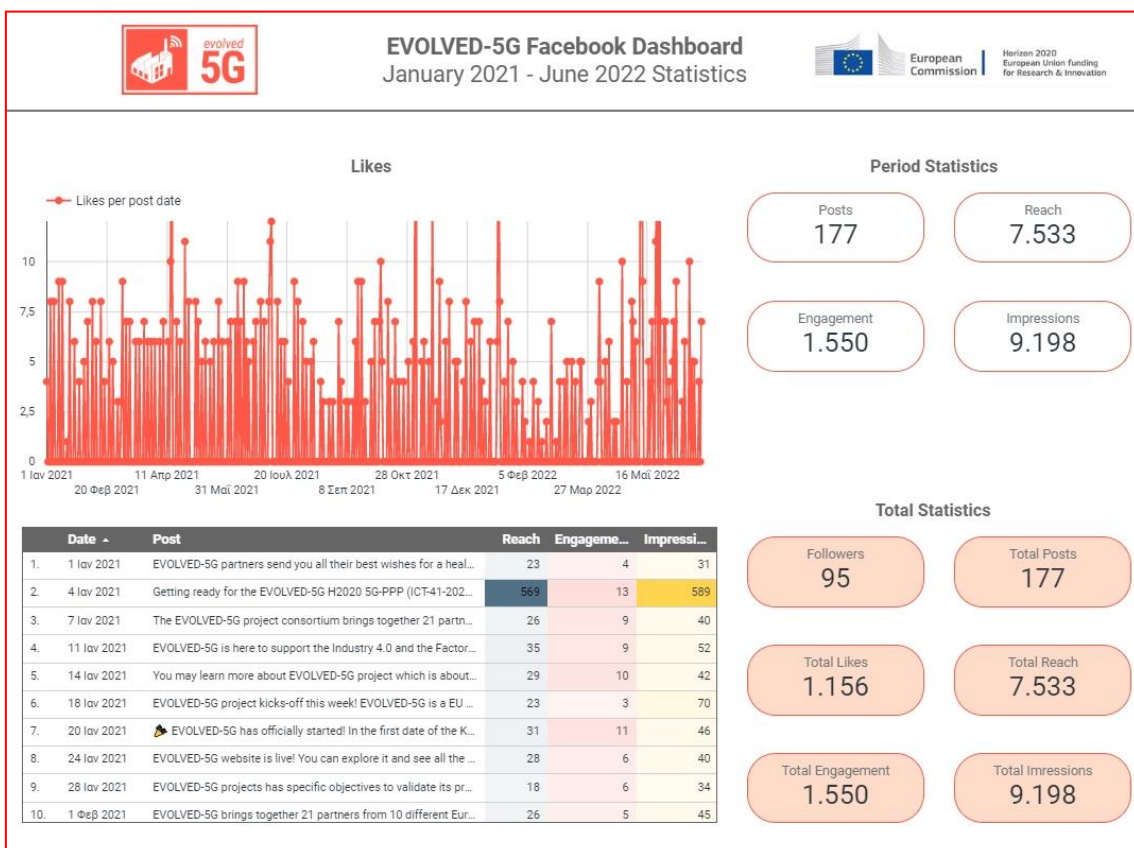


Figure 42: EVOLVED-5G Facebook Dashboard



Figure 43: EVOLVED-5G Total Followers Chart



Figure 44: EVOLVED-5G Total Posts Chart

In Figure 43 and Figure 44 the posts and followers according to the project reporting months for the EVOLVED-5G Facebook account are presented. The number of followers continuously increases with a small but positive rate of change. That was expected, because Facebook attracts mostly non-technical audience and as the project advances the interested scientific community focuses on following the advancements in social media such as LinkedIn and Twitter. On the other hand, the number of posts ranges around 9 posts per month and varies according to the project activities that are being reported during the respective month.

The EVOLVED-5G Facebook statistical dashboard is also available online at <https://datastudio.google.com/reporting/636b763c-5891-4251-8779-51080c1597a4>

Finally, the **Instagram dashboard** is presented (Figure 45). For the specific period, 174 posts have been made acquiring 1.416 likes with 7.600 number of Impressions. Also, the EVOLVED-5G Instagram account has a total number of 400 profile visits and 123 followers.

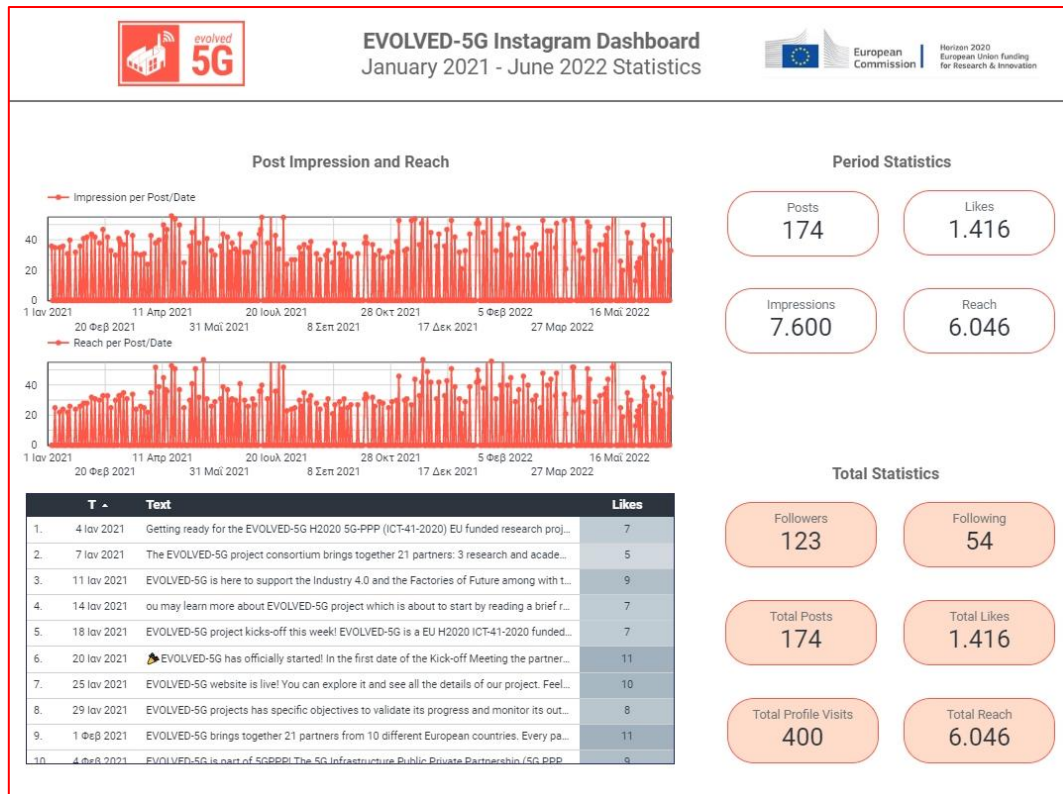


Figure 45: EVOLVED-5G Instagram Dashboard

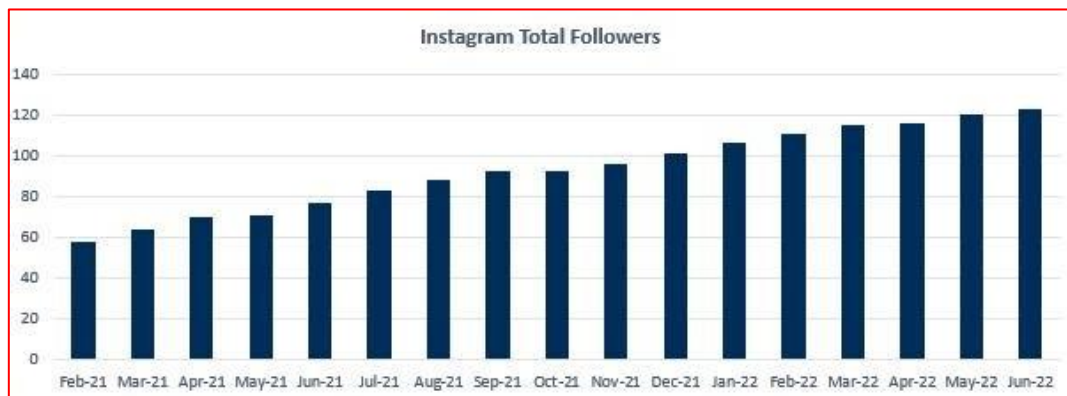


Figure 46: EVOLVED-5G Instagram Total Follower Chart

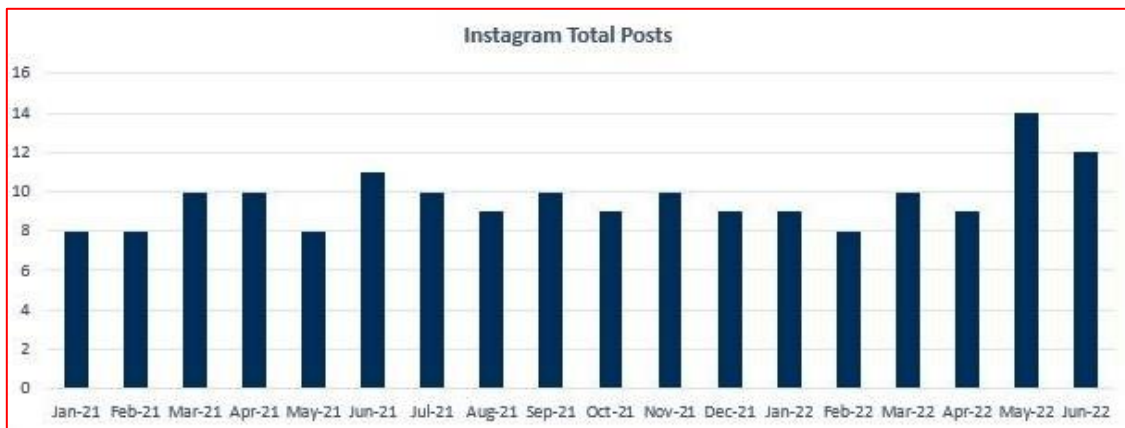


Figure 47: EVOLVED-5G Instagram Total Posts Chart

Similarly, to the previous channels, the EVOLVED-5G Instagram account continues to attract more and more stakeholders (mainly non-technical audience, due to the nature of this channel). The number of followers continuously increases with a small but positive rate of change. The number of posts per month ranges around 9, with small deviations due to differences in the availability of related material.

The EVOLVED-5G Instagram statistical dashboard is also available online at <https://datastudio.google.com/reporting/ab6709e3-17d8-48ad-ac59-43f9a1ebce64>

2.4.6 Communication, Dissemination updated plan and goals for the next period of the project

2.4.6.1 Communication action plan for the next period

The following table briefly describes the phases and the stages of the communication and dissemination plan of the project. In order to reach all the details about the project's plan you may access the D7.1 Dissemination, Communication and 5G-PPP Engagement Plan" [1]. At this point of D7.3 we will describe the upcoming actions for the remaining period of the project.

Table 16: EVOLVED-5G Communication Phases

Phase A (M1-M6)	CO1: To create awareness of the project among the full range of general public and media.
	CO2: To provide a clear view of the project's concept, goals and expected results.
Phase B (M7-M18)	CO3: To create an active community of general public audience/followers and collect feedback to be taken into account by the project's activities.
	CO4: To raise awareness and visibility of the project's results.
Phase C (M19-M36)	CO5: To prepare the ground for the exploitation of project's results by creating market demand for provided innovation.
	CO6: To help raise funds for follow-up projects (e.g., spin-out, spin-offs and start-up companies) by ensuring sufficient communication of exploitation results even after the end of the project.

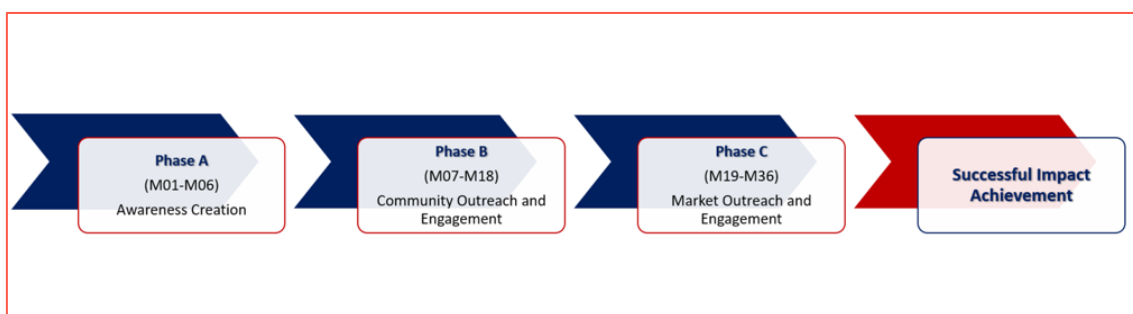


Figure 48: EVOLVED-5G Communication Timeplan

At this point of the project's lifetime the consortium is concentrated in the 3rd phase of the communication and dissemination plan. This phase, targets at the communication and exploitation outcomes. The following paragraph summarizes the basic elements of this period, in the way they have been described in the D7.1 Dissemination, Communication and 5G-PPP Engagement Plan".

Phase C (M19-M36): The third and the final phase of the project's duration sets two additional communication objectives. The first one is to create a connection between the project's

outcomes and the exploitable elements with any potential market involvement; and the second communication objective is responsible for the preparation of the ground for future projects by sharing any results in terms of exploitation. Concerning the first CO of phase C, is to provide the feasibility extensions of the project's outcomes to a market level in order to be utilized in a business level and boost the entrepreneurship and market of the whole society. This may happen by posting in the EVOLVED-5G social media channels, articles related to the research actions of the project. The second CO of this phase would happen by communicating in an extensive way the EVOLVED-5G project so that it can be utilized and serve as the baseline for future research ventures.

The following graph (Figure 49) depicts how the Communication objectives have progressed during the duration of the project's lifecycle.

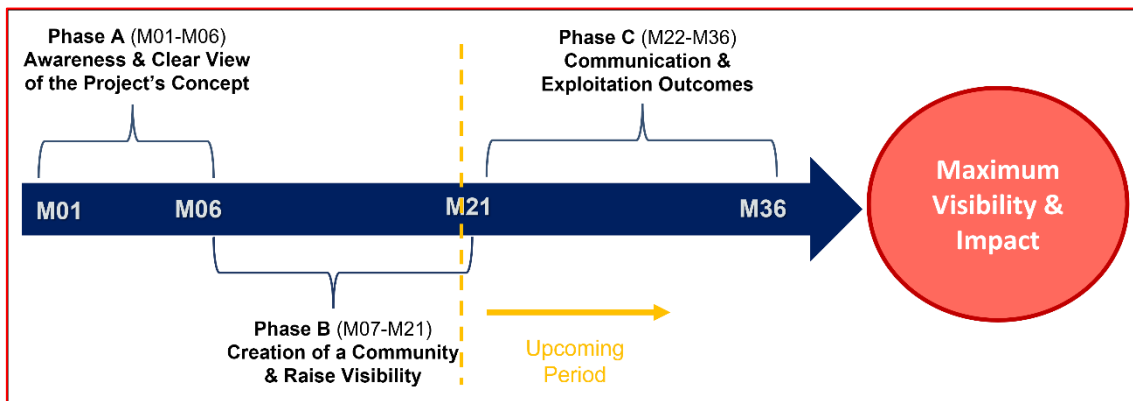


Figure 49: EVOLVED-5G Communication Phases

More specifically, as part of the project's communication and dissemination strategy and time plan, EVOLVED-5G has developed a **website and social media strategy** in order to increase outreach and social impact, which can be illustrated as follows:

1. Update regularly social media content and spark engagement in social media
2. Adapt the content of posts based on the social channel used and the targeted audience (e.g., LinkedIn and Twitter aiming at informing technical/scientific audience)
3. Constant rate of weekly posts (at least an average of two weekly posts per channel)
4. Publish easily recognizable posts exclusively on project's achievements and initiatives
5. Aggregate news and circulate them to the public on a quarterly basis through the project's digital newsletter
6. Evaluate and assess website and social impact and reassess social media strategy as required
7. Trials and tests-oriented material
8. More communication material from face-to-face meetings
9. More printed material for face-to-face events
10. Close collaboration with 6G-SNS and 6G-IA associations

At this point of the deliverable there is no need to restate the communication strategy as it is fully described in deliverable 7.1. However, it is worth mentioning how the consortium is going to differentiate (if any alterations are needed) the existing strategy in order to achieve the goals of phase 3.

As the project progresses and the technical advances come to surface, T7.1 leader, who is responsible for the implementation of the communication plan, has more and more equivalent material to promote. This leads to more material uploads in website and social media. This situation also gives us the chance to differentiate in a smoother way the content between the

social media platforms. Just as reminder, we have stated the following about social media differentiation in D7.1:

- **LinkedIn/Twitter:** Initially general content but from M6 and on, more technical and project-focused posts aiming at technical and scientific diffusion of EVOLVED-5G results.
- **Facebook/Instagram:** General content addressing mainly non-technical audience - posts on EVOLVED-5G topics of general interest and communication of all dissemination and showcasing activities.
- **YouTube:** Addressing all types of audiences (technical and general) with videos focused on presentations, conferences, events, trials tutorials etc.

Additional to the above mentioned, is the face-to-face activity. As face-to-face meetings and events started to take place during the COVID-19 pandemic, there is more material available for communication so there is a bigger effort on social media for both promoting the event before its initiation but also during its happening. Furthermore, more printed material is required as the face-to-face events resume on their normal schedule. The first stickers have been provided to the partners during the first face-to-face meeting in Madrid on May.

Another variable that affects the communication plan is the initiation of the WP6 which is responsible for the community creation around the EVOLVED-5G project. This WP is consisted of training sessions and courses by the members of the consortium. In order to achieve a higher audience, the assistance of T7.1 is of utmost importance. We have already performed such actions in the previous months and will continue to support WP6 by dedicated posts on social media and the website.

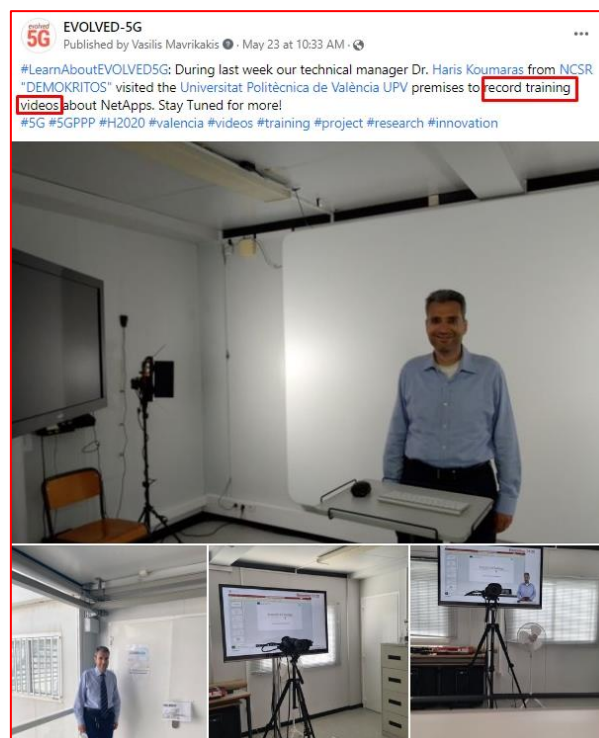


Figure 50: WP6 related post

Apart from the trainings and the courses, T7.1 boosts the visibility of other parallel activities, such as the marketplace and the forum, as well as the accelerator library. Besides the website update which has been described in previous chapter, there is also an effort to support such actions via the social media channels.

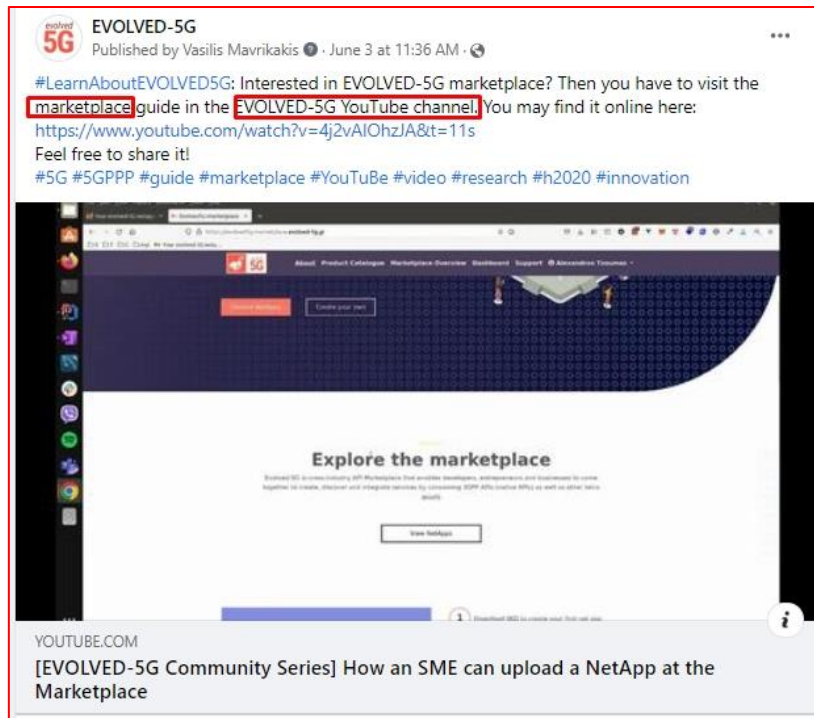


Figure 51: Marketplace YouTube sample post

Concerning the **hashtags (#)**, and the **mentions (@)** the plan is fully described in T7.1. However, it is worth mentioning that as the project evolves there is the need for more relevant hashtags and mentions in order to diffuse project's material in the appropriate audience.



Figure 52: Dedicated Hashtags

Also, during the project's lifetime, new associations and organisations are created, such as the 6G-SNS-IA (<https://6g-ia.eu/>) that is the continuation of the 5G-PPP (<https://5g-ppp.eu/>), in the road to 6G, and in which several partners are already members.

One additional means to achieve higher visibility and attract the wider possible audience is the creation and the distribution of project-oriented material to associations and organizations related to the H2020 project as we have once done in the previous months about the EVOLVED-5G NEF EMULATOR in cordis.eu website (<https://cordis.europa.eu/article/id/435466-making-strides-towards-an-open-and-dynamic-5g-ecosystem>).

Making strides towards an open and dynamic 5G ecosystem

An EU project is developing a novel emulator to support SMEs in their efforts to exploit 5G infrastructure capabilities.

 DIGITAL ECONOMY

SCIENTIFIC ADVANCES



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Figure 53: NEF emulator article in cordis.eu

At this point, it is very useful to refer not only to counterpart organizations, but also to the interaction taking place in social media channels, which is very important for the success of the communication plan. Such channels are the following ones:

- the EU Research & Innovation magazine – HORIZON (<https://www.facebook.com/horizon.magazine.eu>)
- the Digital EU (<https://twitter.com/DigitalEU>)
- EU Research & Innovation - H2020 (https://twitter.com/EU_H2020)
- the EU Science, Research and Innovation account (<https://www.linkedin.com/showcase/european-commission-joint-research-centre>),
- the EU Science profile (https://www.instagram.com/eu_science/)
- https://europa.eu/european-union/contact/social-networks_en#n:i:4+e:t:34+s
- the HORIZON magazine (<https://horizon-magazine.eu/>)
- 5G-PPP (<https://5g-ppp.eu/>)
- 6G-IA (<https://6g-ia.eu/>)

Some of the above-mentioned bullets are social media channels or organizations that give the chance to create a community and gain more visibility for the project.

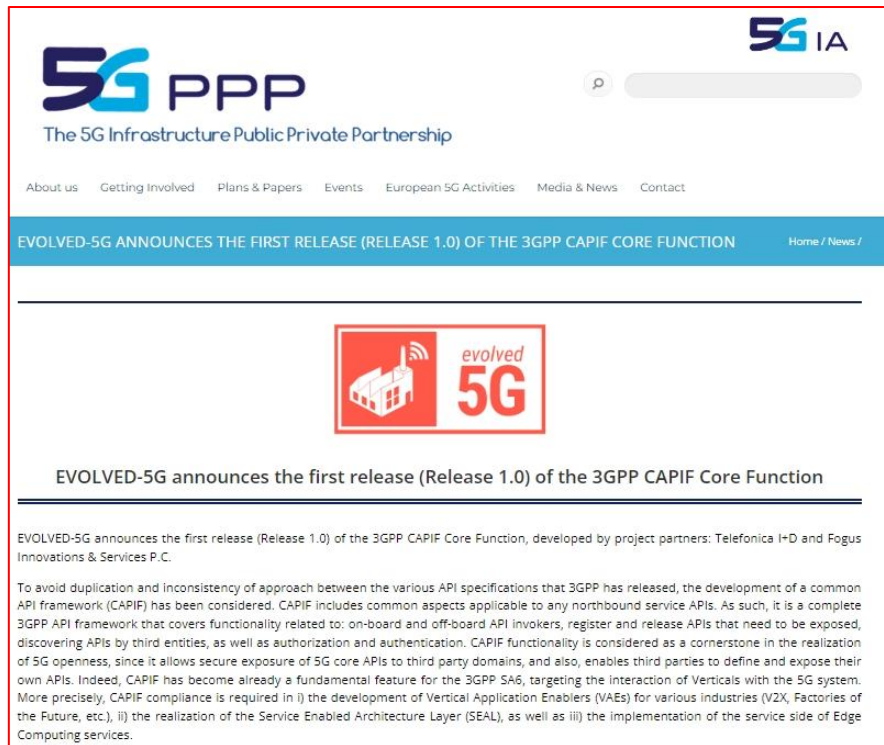


Figure 54: EVOLVED-5G activity on 5G-PPP platform



Figure 55: EVOLVED-5G reshared material

Finally, dedicated digital material will be created on a higher frequency for landmark events in order to enhance the image of the project and provide event-oriented information. A very characteristic example is the image (Figure 56) which was created in order to promote the participation of the project in the EuCNC & 6G Summit event of 2022.



Figure 56: EVOLVED-5G EUCNC image

2.4.6.2 Dissemination action plan for the upcoming period

The next table summarises the dissemination targets/KPIs set for the 2nd period of the project.

Table 17: Dissemination Plans

Planned Dissemination Activities	Metrics	Target (as per DoA)	Timeline (in Months)	2 nd Period Target M19-M36
Publications in journals, workshops and conferences, articles	Number of publications	>20	M06-M36	>15
Presentations in scientific events/conferences	Number of presentations	>20	M01-M36	>14
Trials/Showcases	Number of showcases	>5	M19-M36	>5
Exhibitions in industrial and scientific events - Booths	Number of exhibitions/booths	>5	M12-M36	>4

Organization of events (workshops/special sessions/seminars/training/poster sessions etc.)	Number of events	>10	M06-M36	>8
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Based on the provided columns, any interested stakeholder can see the dissemination activities in comparison with the dedicated goals per period. The planning has been discussed in D7.1 and in previous chapter. At this point, we are going to discuss about the dissemination activities of the second period. As set during the D7.1, the goals of the second dissemination period are the following ones:

- More than 15 publications in journals, workshops and conferences, articles
- More than 14 presentations in scientific events, conferences
- More than 5 trials and showcases
- More than 4 exhibitions in industrial and scientific events – booths
- More than 8 events organized by the consortium (workshops/special sessions/seminars/training/poster sessions etc.)

As the project progresses and evolves, the dissemination will be focused on more technical material due to the bigger availability of material from trials and technical achievements.

The following table briefly describes the target audience of the dissemination activities so as to provide a clearer view about the targeted events. In this a way more comprehensive view about related activities is provided to any interested reader.

Table 18 EVOLVED-5G Target Audience

Target audience	Target Activities
Industry	Liaison with industrial associations (e.g., 5G ACIA, GSMA, XR4ALL, PTCRB). Publication of articles in trade press. Participation in relevant conferences/workshops with large audience among industrial organizations. Organization of workshops and demo events. Individual presentations / discussions with key organizations.
Vertical business players (including SMEs and industrial actors)	Liaison with vertical business players (e.g., XR4ALL 5GAA). Publication of articles. Participation in relevant conferences/workshops. Organization of workshops and demo events at vertical business sites.
5G-PPP Community	Promotion of the 5G-PPP at programme level. Direct liaisons with the 5G Infrastructure Association (5GIA), other existing 5G PPP governance bodies and working groups (e.g., 5G Security WG, 5G Trials WG, 5G Architecture WG, 5G Network Mgt and QoS).
5G Research & Innovation Actors	Liaison and collaboration with researchers and academics from universities. Peer reviewed publications in scientific journals. Participation in conferences/workshops with large audience among the scientific community Demos and exhibitions, for instance at 5G PPP venues like EuCNC, or Global 5G events, targeted communications, webinars, and online and offline presence and materials.

	Through MoU signed between 5G PPP and Cybersecurity PPP (ECSO) liaison through 5G Security WG with ECSO SRIA WG (i.e. WG6) and Sectorial demand WG (i.e. WG3).
SDOs and open-source communities	EVOLVED-5G will collaborate with several standardization. These bodies will be informed of any relevant project outcome that can be of interest for their activities. Stakeholder contributions will also be encouraged through targeted communications and participation to events, as well as via alignment of efforts with 5G PPP Standardization WG.
Regulatory, policy makers and Certification bodies	Targeted communications and direct liaisons participation in relevant events promo material.

3 5G-PPP ENGAGEMENT AND ACTIVITIES

As it has been thoroughly described in D7.1 “Dissemination, Communication and 5G-PPP Engagement Plan” [1] and more specifically in Section “EVOLVED-5G Participation In 5G-PPP Boards, WGs And Meetings/Activities”, since the beginning of the project, EVOLVED-5G consortium participates in joint dissemination activities with the aim to actively contribute to 5G WGs. The purpose is to align and create synergies with the 5G-PPP Working Groups (WGs). This stream of activities is very important to ensure that the outcomes of the EVOLVED-5G project are aligned with the research ecosystem, and that the main achievements, especially the technical ones, get proper visibility in the research community.

3.1 EVOLVED-5G PARTICIPATION IN 5G-PPP BOARDS, WGS AND MEETINGS

This section describes the activities undertaken by the EVOLVED-5G partners in the context of the 5G-PPP related activities. Table 19 presents the 5G-PPP WGs which EVOLVED-5G partners attend and contribute

Table 19 EVOLVED-5G 5GPPP WGs and representatives

Working Group	Main representative	Company	Second representative	Company
5G-PPP Steering board	Javier Garcia Rodrigo	Telefónica	Dr. Harilaos Koumaras	NCSR Demokritos
5G-PPP Technical Board	Dr. Harilaos Koumaras	NCSR Demokritos	Dr. Dimitris Tsolkas	FOGUS
Pre-Standardization	Dr. Apostolis Salkintzis	Lenovo	David Artuñedo	Telefónica
5G Architecture	Dr. Apostolis Salkintzis	Lenovo	Dr. Dimitris Tsolkas	FOGUS
Software Networks	Dr. Apostolis Salkintzis	Lenovo	Dr. Regel G. Usach	UPV
Vision and Societal Challenges	Javier Garcia Rodrigo	Telefónica		
SME	Vaios Koumaras	INFOLYSIS	Janez Sterle	Internet Institute
Test, Measurement and KPI Validation (TMV)	Janez Sterle	Internet Institute	Dr. Dimitris Tsolkas	FOGUS
5G Comms	George Makropoulos	NCSR Demokritos	Vasileios Mavrikakis	INFOLYSIS

3.1.1 Steering Board

The project coordinator Javier Garcia Rodrigo has actively participated in all the telco calls (due to COVID-19 restrictions the physical meetings were not an option) of the 5G-PPP Steering Board, representing EVOLVED-5G.

3.1.2 Technical Board

Dr. Harilaos Koumaras (NCSR) Technical Manager of the project and Dr. Dimitris Tsolkas (FOG), deputy Technical Manager, have participated in the telco calls of the 5G-PPP Technical Board, representing EVOLVED-5G. On 24th June 2021 Dr. Dimitris Tsolkas (FOG) participated in the 5G-PPP TB Workshop (virtual meeting), where he presented the EVOLVED-5G project by sharing the project's overview along with details about the architecture and the members of the consortium.

3.1.3 Architecture WG

The deputy Technical Manager Dr. Dimitrios Tsolkas (FOG) has actively participated in all the telco calls of the Architecture WG. EVOLVED-5G has taken part in the 5G Architecture WG Meeting (virtual) held on 30th of April 2021. During the meeting the overall framework of the project as well as some very useful details about its pillars and its objectives were presented.

3.1.4 Software Defined Networks WG (SDN)

For the SDN/NFV WG, monthly teleconferences (every 2 weeks) have been planned in order to discuss and decide on the following:

- Evolution to VNFs, CNFs, evolution from VNFs up to NetApp
- Link NetApp with layered protocol
- The market-place problem/Business
- Exposure of RESTful APIs
- APIs Monitoring and provisioning functions
- NetApp: application translates network API to vertical API
- Security: NetApp can be deployed in secured and not secured mode
- 3GPP 5G API Requirements

All the above-mentioned bullets were the basis for the main activity of the WG of creating the Whitepaper named “NetApp: Opening up 5G and beyond networks”, which is still an ongoing process.

On 16th of September 2021 Dr. Regel G. Usach (UPV) participated in the teleconference where she presented EVOLVED-5G vision and the overall view of the project.

3.1.5 SME WG

EVOLVED-5G joined the WG in early February of 2021 represented by INFOLYSIS. A first teleconference was organized on 1st March 2021 where the main topic of the telco was the upcoming formation of Smart Networks and Services (SNS) partnership, that follows the 5G-PPP Horizon Europe program, and the role of SMEs in it. Also, the latest news from 5G-PPP new projects (with focus on ICT-41 and ICT-52) were presented by Jacques (SME WG leader), and specific partners (including INFOLYSIS) mentioned their participation in the new projects. To that end, Vaivos Koumaras (INF) presented briefly the role and activities of INFOLYSIS in EVOLVED-5G. Moreover, interactions between the SME WG and other initiatives were discussed and “Find your SME” web page (<https://www.networkdeurope.eu/find-the-sme-you-need-new-page>) at NetworkEurope (<https://www.networkdeurope.eu>) has been updated by INF.

On 16th September 2021 NetworldEurope SME Working Group and the SME WG-European Digital SME Alliance Workshop on "5G, Edge Computing and IoT", has been attended by INF on behalf of the EVOLVED-5G.

Another SME WG general assembly meeting took place online on Monday 15th of November 2021, where the following topics were discussed: SNS partnership program, Feedback from Horizon Europe initial calls, Feedback from the 1st joint workshop between the SME WG and the European DIGITAL SME Alliance, Feedback from the 1st joint workshop between the SME WG and the European DIGITAL SME Alliance, proposal for new workshop on Components for 6G, discussion on the open letter "The EU needs an effective digital markets act".

It was also highlighted that there will be no new update of the SME web page or brochure before at least mid-2022, when the new Coordination and Support Action (CSA) supporting 5G-PPP and NetworldEurope shall be launched.

During Dec 2021-March 2022, there were no activities taking place for the SME WG, apart from communication via emails for potential future events and dissemination opportunities.

3.1.6 Test, Measurement and KPI Validation WG (TMV)

Dr Harilaos Koumaras made a presentation on 2nd of November 2021, in order to introduce EVOLVED-5G in TMV WG. During the presentation it has been highlighted that apart from the 5G related KPIs, the project will focus on addressing B5G KPIs and Vertical KPIs, which are of prime interest for TMV WG.

3.1.7 Pre-Standardization WG (Pre-Std)

EVOLVED-5G participated in the first meeting that took place on 31st of March 2021.

During the meeting a brief update on the status of the SNS Work Programme Sub-Group (SNS WP SG) was presented. The work being done includes an "SNS Impact Roadmap", which is relevant and aligned to the work done by the Pre-Std WG. It was noted that SNS WP Stream A and B are targeting impact on 3GPP Rel19+ and 6G SI/WI and ITU. The impact roadmap includes also non 3GPP opportunities. Moreover, there was a special focus on B5G/6G Roadmap and the roadmap TR was presented. Upon processing of input from all survey respondents, the high-level roadmap has been drafted.

3.1.8 5GPPP Comms

EVOLVED-5G representatives (George Makropoulos-NCSRD and Vasilios Mavrikakis-INF) have been constantly monitoring the activities of this WG, by participating in the initial teleconference on 10th of May 2021 of the group where specific information about promotional, dissemination and stakeholders' engagement activities, were provided.

An activity that reflects the involvement to the WG is the constant circulation, to all EVOLVED-5G partners, of the emails stemming from 5G Comms describing synergies and impact creation opportunities via events, new calls, scientific papers, co-organization of workshops and special sessions

3.2 ACTIVITIES UP TO M20

3.2.1 Contributions to 5G-PPP

Up to M20 of the EVOLVED-5G project the partners of the consortium have been actively participating in the 5G-PPP organized activities and an ongoing monitoring of the activities has been performed following the 5G-PPP working groups that are described in the previous subsection. The contributions are as follows:

3.2.1.1 Contribution to white paper View on 5G Architecture v4.0

The fourth release of this white paper is focusing on the output of the Phase III projects, thus discussing the latest findings in the integration of large infrastructure, the integration of the verticals into those findings, the long-term evolution of the technology and the service specific technology. This view is consolidated in the White Paper [2], which presents the current overview on the 5G Architecture as developed by European research efforts.

In the light of the above, EVOLVED-5G has contributed to the Section 2.6.7 “NetApp principles and implementation aspects” where the definition of the NetApp and the approach that the project introduces towards the development of the NetApps was described.

3.2.1.2 Contribution to ‘European Vision for the 6G Network Ecosystem’ white paper by 5G Infrastructure Association (5G IA)

The White Paper [3] explains how 6G is expected to play a key role in the evolution of the society towards the 2030’s, as the convergence between the digital, physical and personal worlds will increasingly become a reality. Furthermore, 6G will support the European Green Deal’s objective of reaching climate neutrality for Europe by 2050. This and other objectives of 6G will also greatly contribute to the United Nations Sustainable Development Goals. In the final part, the White Paper presents possible opportunities and obstacles related to 6G as well as a series of recommendations for both policy makers and businesses.

3.2.1.3 Contribution to “5G Ecosystems” white paper by Infrastructure Association Vision and Societal Challenges Working Group Business Validation, Models, and Ecosystems Sub-Group (BVME)

EVOLVED-5G project has contributed to the “5G Ecosystems” White paper [4] [5]. The document discusses 5G ecosystems as a prerequisite for value creation for and by the engaged stakeholders and return of investment as a potential award for the engagement. Moreover, the paper describes a clear identification of 5G stakeholders which supports the creation and evolution of the 5G ecosystems by characterising the potential role that each actor can assume.

3.2.1.4 Contribution to 5G-PPP Phase 3 Projects Brochure

EVOLVED-5G has also contributed to the 5G-PPP Phase 3 Project Brochure, which complements the brochures from phases 1 & 2 with basic information about all the new projects.

EVOLVED-5G	
Project Acronym	EVOLVED-5G
Project Full Title	Experimentation and Validation Openness for Longterm evolution of VErtical inDUstries in 5G era and beyond
Coordinator: name, company	Javier Garcia Rodrigo, Telefónica Investigación y Desarrollo S.A.U.
Start Date – End Date	Jan 2021 - Dec 2023
Website	https://evolved-5g.eu/
e- mail	evolved-5G-Contact@5g-ppp.eu
Twitter account	@evolved5g

Figure 57: EVOLVED-5G in 5G-PPP Phase 3 Project Brochure – page 1

	A	B
13	Applications & Expected impact (max 1000 characters spaces included) EVOLVED-5G will disrupt the market of MNOs and Industry 4.0 vendors by: 1) Creating the necessary tools and software development workspace needed by third party developers, startups and SMEs in order to start coding NetApps that exploit the 5G Network Programmability features/advances. 2) Launching the NetApp Open Repository and Marketplace for the Industry 4.0 vertical industry, introducing new business models and value chains for MNOs. 3) Reassuring sustainability, since we will build a community of Developers, Entrepreneurs, Spin-Offs, Startups and SMEs across Europe, who will be trained with hands-on seminars on Network Programmability. The expected impact of EVOLVED is fivefold: Impact on Smart Manufacturing Vertical Industry (Factories of the Future -- FoF --): * EVOLVED-5G is poised to help transform the way the manufacturing industry operates by leveraging the unprecedented speed/throughput, low latency, and bandwidth capacity of the 5G technology in conjunction with the process automation introduced by Industry 4.0 services. All manufacturing phases and processes will find support in EVOLVED-5G through the development of NetApp-enabled novel uses-cases around 4 main pillars which, in turn, will target specific target applications in the vertical industry of smart manufacturing as follows: * Pillar#1 -- Innovation in the interaction of employees and machines through AR features and remote-control capabilities --: (1) Mixed Reality (MR) assisted manufacturing, (2) Intent-driven Chatbots for precise maintenance, (3) Haptic-driven console for industrial surface repairing (hot bonding). * Pillar#2 -- Efficiency in FoF operations with novel predictive maintenance applied on digital factory twin --: (4) IoT/M2M-based remote monitoring platform, (5) AI based video analyzer for industrial and robotics safety, (6) ML-driven anomaly detection system for Industrial Processes. * Pillar#3 -- Security guarantees and risk analysis for the FoF communication and management systems --: (7) L7-aware Whitebox Switch with Dynamic SFC and TSN Support, (8) SIEM (Security information and event management) system, (9) Blockchain Data Brokerage Engine. * Pillar#4 -- Agility in the production line infrastructure through automation and robotic parts --: (10) AI-driven Humanoid robot, (11) AI-driven logistics robotic fleets. Impact on App Market: Network-driven Apps (NetApps) * EVOLVED-5G promises even more of an upset in programmability, blending the untapped potential of multiple simultaneous network functions with endless combinations and creativity, and promising a new generation of apps, the NetApps, that deliver a new user experience upgraded with the novel features that the tight integration with 5G offers. Impact on MNOs' Value Chain: A business model for service providers * There are unforeseen opportunities for service providers in leveraging the variety of addressable business models and the innovation enabled by 5G, through collaboration in innovative services over the low-latency and highbandwidth edge cloud environment: Augmented/virtual reality for Industry 4.0, Secured high-quality video streaming, Optimized big/small data transfer for maintenance tasks or digital twin are some distinctive examples. Impact on Market and Economy: 5G conquer of ICT market * By 2025, it is estimated the market value of 5G consumer services will increase moderately to US\$ 238 billion, but over the same period the value of 5G industry digital transformation will	
14	Vertical use cases addressed Please tick the relevant ones	
15	Industry 4.0	<input checked="" type="checkbox"/>
16	Agriculture & Agri-Food	<input type="checkbox"/>

Figure 58: EVOLVED-5G in 5G-PPP Phase 3 Project Brochure – page 2

3.2.1.5 Contribution to the 6th Edition of the European 5G Annual Journal

The project provided its contribution to the sixth edition of the European 5G Annual journal that has been published by the Full-5G project (<https://5g-ppp.eu/full-5g/>) in Q2-Q3 of 2021. This issue of the Journal has been produced in collaboration with other H2020 projects. Contribution on 5G innovations and major achievements expected from the projects are presented for the broad public, but also for wide spectrum of researchers and managers. This represents a significant opportunity to start disseminating the activities of the project. The previous editions are available on the 5G-PPP website (<https://5g-ppp.eu/annual-journal/>).

EVOLVED 5G

EVOLVED 5G vision and concept

With Non-Public 5G Networks (NPN) already emerged, the existing experimentation platforms around Europe should increase the development pace to incorporate realistic business cases for the use of 5G by vertical industries. In this endeavor, the directions provided by 3GPP (mainly in SA6) are considered as an effort to provide verticals with a common ground for upgrading their applications.

A central concept that has emerged is the composition of NetApps (Network Application) i.e., services that consume 3GPP APIs (native APIs) as well as other telco assets (referring to business support system – BSS APIs, e.g., service orchestration APIs) to support the vertical application with network-related capabilities. For example, a NetApp could consume APIs that provide monitoring events and network slice configuration analysis to compose a service that guarantees quality of experience for latency-sensitive applications.

EVOLVED 5G embraces the potential of the

verification environment, i.e., a workspace/SDK for third-parties, which will embrace the principles of continuous integration and continuous delivery (CI/CD) and adopt the software architecture used for microservices.

- Provide the means for enabling the digital market around the NetApps by designing, developing, releasing and maintain an active marketplace/App store that will incorporate vertical data space interaction (through IDS broker) and store NetApps that are certified by operator-driven certification tools.
- Provide a clear and quantified contribution towards the 5G penetration in smart manufacturing by designing, developing, validating, and publishing innovative NetApps and multiple applications on top of them that will cover major business use cases for the factories of the future.
- Quantify the performance and the flexibility that 5G provides to verticals, though a set of vertical-driven measurement campaigns, which

Figure 59: EVOLVED-5G in European 5G Annual Journal-page 1

An abstract representation of the EVOLVED 5G Approach can be found in Figure 62.

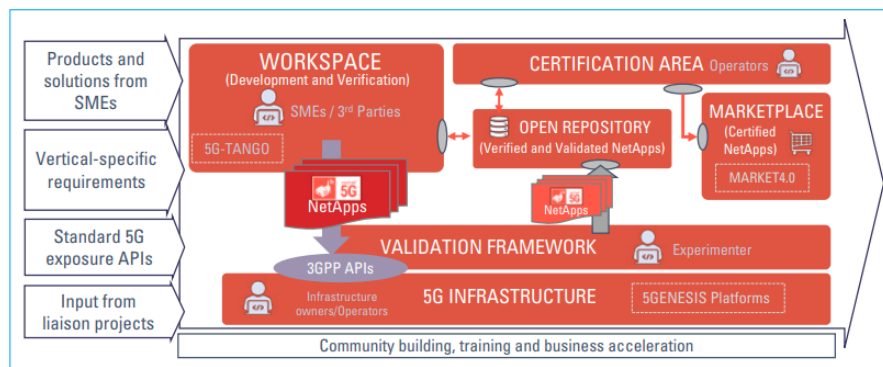


Fig. 62: EVOLVED 5G Approach

EVOLVED 5G has just started

EVOLVED 5G project started on January 1, 2021 and it is currently working on the definition of the

design of the reference architecture, the process definition and first steps in the actual production of the workspace (SDK) for the NetApp development and the validation framework and

Figure 60: EVOLVED-5G in European 5G Annual Journal-page 2

3.2.1.6 Contribution to brochure “European SME Expertise in 5G and Beyond” (SME WG)

This is the first brochure to be published under the umbrella of “NetworldEurope”, the new name of the European Technology Platform previously called “NetWorld2020”. In the specific edition several new SMEs are presented introducing their expertise and skills of SMEs in 5G-related technology, and their involvement in vertical sectors. As it can be seen from the figures below, EVOLVED-5G project is represented by 4 SMEs, namely Internet Institute, 8Bells, Infolytis and Fogus.



Figure 61: brochure “European SME Expertise in 5G and Beyond”



Figure 62: “European SME Expertise in 5G and Beyond”- Internet Institute profile



8bells
Research & Consulting

YEAR ESTABLISHED
2016

NUMBER OF EMPLOYEES
25

MORE INFORMATION
www.8bellsresearch.com

CONTACT
athens@8bellsresearch.com

EXPERTISE IN 5G IOT SATELLITE COMMUNICATIONS TRANSPORT & LOGISTICS MANUFACTURING SMART CITIES HEALTH

BACKGROUND, EXPERTISE & SKILLS

Eight Bells (8BELLs) is an independent Research and Consulting company specializing in selected parts of Information and Communication Technologies (ICT) as well as in modelling and analysis for businesses, based in Nicosia, Cyprus. The company was established in 2016 by ICT researchers and market analysts pursuing the application of their research expertise and innovations in the ICT related area.

The main areas of research and technical expertise are customizable solutions that enhance modern communications relevant to the area of 5G Mobile Technology, Network Function Virtualization (NFV) and management solutions for Cloud infrastructures.

ACHIEVEMENTS & SUCCESS STORIES

Translating innovative ideas to products and services is one of our core values and our competitive advantage. We are an applied R&D company, implementing ideas and exploring new frontiers. A recognition of our efforts is our identification as "Key Innovator" in the framework of the EU Research Project "GUARD" (Horizon 2020) by EU Innovation Radar.

Our main achievements are:

- a) Leading SME in 5G domain.
- b) Participating in 2 CEF (Connecting Europe) Flagship Projects - autonomous vehicles & 5G.
- c) Our privately own 5G Mobile Station for Research use.
- d) Participating in 7 5G (H2020 SGPPP) Research Projects (6 of them being active):
 - SMARTSGRID
 - SG-INDUCE
 - EVOLVED-SG
 - AFFORDABLESG
 - SG-MED
 - SG-CARMEN
 - SG-ESSENCE
- e) Participating in 1 6G Research Project: H2020 SGPPP AI@EDGE

INTEREST FOR FUTURE R&D&I COOPERATION

Since its founding, EIGHT BELLS has invested in Research & Development and achieved to climb at the forefront of specific sectors of ICT technology, implementing ideas and exploring new frontiers. Our analysts have a strong focus on R&D with a long track record in EU funded research initiatives. They have actively participated in (and coordinated) several R&D projects in the field of networking and telecommunications and have authored or co-authored over 80 papers in international refereed journals and conferences. Moreover, the company's portfolio includes system engineering and integration services, network design and implementation, R&D consultancy, as well as targeted and customized innovative solutions. Our future R&D&I Cooperation interest include: SOFTWAREZEE NETWORKS, CYBERSECURITY, IOT AND SENSORS, OPTICAL NETWORKS, AI & SOFTWARE SOLUTIONS, SPACE - DEFENCE - SECURITY APPLICATIONS.

Figure 63: "European SME Expertise in 5G and Beyond" - 8bells profile



INFOLYSIS

YEAR ESTABLISHED
2017

NUMBER OF EMPLOYEES
14

MORE INFORMATION
www.infolytis.gr

CONTACT
research@infolytis.gr

EXPERTISE IN 5G IOT CHATBOT APPS TRANSPORT & LOGISTICS HEALTH PUBLIC SAFETY SMART CITIES

BACKGROUND, EXPERTISE & SKILLS

INFOLYSIS P.C. is an innovative SME company, established in Athens, Greece, specialising on the design and development of chatbots, either as custom-made standalone applications or as subscribed-based services (Chatbot as a Service) via the privately owned chatbot platform. Chatbots are applications that simulate human conversation, based primarily on conversational flows, enriched with DL/NLP technologies for more sophisticated solutions.

INFOLYSIS is committed to driving research results forward in order to expand chatbot applicability in novel ICT use-cases by experimenting with novel technologies, such as 5G, SDN/NFV at the network edge and container-based virtualization in IoT domains. An indicative example includes the INFOLYSIS IoT Virtual GW, which offers the provision of agile interoperability over heterogeneous IoT domains, along with a

ACHIEVEMENTS & SUCCESS STORIES

In 2017, INFOLYSIS achieved to commercialise the first chatbot business solution over Viber in Greece, enabling food ordering via chatting. This pioneering solution created strong business cooperation with Viber, granting to INFOLYSIS the title of Viber Preferred Enabling Partner.

Since then, INFOLYSIS demonstrated its solutions to many events organised by Viber. Two events are standing out, the "Viber for Business Innovation Day" at SNFCC and the "Viber Chatbot event" at INNOVATHENS, where both the CEO of Viber Mr. Djamel Agasou and the VP of Global Partnerships Mrs. Cristina Constandache were present, together with key-players from the Greek market.

Concerning R&D, INFOLYSIS successfully participates in two SG-PPP/H2020 projects, SG-GENESIS (www.sggenesis.eu) and SG-Drones (www.sgdrones.eu), which validate 5G applicability in real life use-cases.

INTEREST FOR FUTURE R&D&I COOPERATION

INFOLYSIS plans to further enhance chatbot characteristics and functionalities with DL/NLP technologies for providing AI-driven chatbots to the Greek market and therefore there is a strong interest for building a cooperation with AI specialised companies.

Moreover, INFOLYSIS is looking for expanding chatbot applicability to new use-cases, such as improving citizen engagement in smart cities and to smart agriculture use-cases for simplifying continuous monitoring process.

Finally, INFOLYSIS also aims to expand its target market for the privately owned chatbot platform beyond the boundaries of Greece, targeting at popular Viber international chatbot markets in Europe, Russia and Asia, but also extending chatbot development over additional messaging platforms that are popular in specific countries, targeting at niche markets.

Figure 64: "European SME Expertise in 5G and Beyond" - Infolytis profile



Figure 65: “European SME Expertise in 5G and Beyond” - Fogus profile

3.2.1.7 Beyond 5G/6G KPIs and Target Values” Whitepaper

EVOLVED-5G project has contributed to the “Beyond 5G/6G KPIs and Target Values” whitepaper [6], that has been initiated by the TMV WG. This document, released in June 2022, is presenting the current view of the available B5G and 6G KPIs from the 5G-PPP phase III projects with an emphasis on the views of the ICT-52 Smart Connectivity Beyond 5G projects. This overview includes mapping of the KPIs previously defined for 5G, and evaluating how they might evolve to fit the B5G and 6G vision. The paper consists of two main technical parts. The first part gives an overview of standard network KPIs with defined target values for the 5G system. These are well-known KPIs that will evolve in 6G by changing target values. The second part presents KPIs collected from ICT-52 research projects aimed at B5G and 6G systems. These KPIs are processed in terms of being grouped according to KPI type or context, and they are presented with references to standards and target values where possible and available. The white paper is intended to be updated and re-published every year to track the B5G and 6G KPIs evolutions.

3.2.1.8 Contributions to 5G-PPP Brochures, (BVME and TMV WG)

Moreover, the project has contributed to the TMV WG KPI Brochure, including all the 5G-PPP projects with a common interest in the development of test and measurement methods, test cases, procedures and KPI validation, and to the BVME 5G Ecosystems Brochure, that were both presented in the EuCNC 2022.

3.2.1.9 Contributions to the Pre-Standardization WG

The 5G-PPP Pre-Std WG triggered the collection of standardization contributions that all EU projects have accomplished during Q1/2022, in order to produce a comprehensive “SDO Impact Report”. The project provided the requested input which is succinctly depicted in the below table.

Table 20: Contributions to the Pre-Standardization WG

Research item	SDO	SDO WG	Target study	Contribution
Enable API related analytics to support the Application Data Analytics Enablement Service (FS_ADAES) for verticals.	3GPP	TSG SA6	FS_ADAES Rel.18	New KI contribution submitted to 3GPP SA6, entitled “Key Issue on support for API analytics” - S6-220642
Enable slice-related analytics to support the Application Data Analytics Enablement Service (FS_ADAES) for verticals.	3GPP	TSG SA6	FS_ADAES Rel.18	New KI contribution submitted to 3GPP SA6, entitled “Key Issue on support for analytics related to slicing” - S6-220644 (approved)
Enable CAPIF enhancements to support the Application Data Analytics Enablement Service (FS_ADAES) for verticals.	3GPP	TSG SA6	FS_ADAES Rel.18	New KI contribution submitted to 3GPP SA6, entitled “Key Issue on CAPIF enhancements” - S6-20645
Enable DN-related energy analytics to support the Application Data Analytics Enablement Service (FS_ADAES) for verticals.	3GPP	TSG SA6	FS_ADAES Rel.18	New KI contribution submitted to 3GPP SA6, entitled “Key Issue on DN related energy analytics” - S6-220860 (revision of S6-220646)

3.2.2 Upcoming contributions

At the time of writing this document there is an ongoing work for additional contributions that EVOLVED-5G plans to deliver to 5G-PPP. In more details the upcoming contributions are as follows:

- Contribution to 5G-PPP 3rd BVME White Paper on “5G Ecosystems Business Modelling” (Q4/2022)
- Contribution to 5G-PPP TMV WG White Paper “KPIs Measurement Tools-From KPI definition to KPI validation enablement
- Contribution to 6G Arch WG White Paper “6G Architecture “

As far as the 6G Architecture White paper is concerned, the expected contributions refer to Section 7.1 “Mobile Network Openness” in which EVOLVED-5G partners will provide details about the NEF and CAPIF services and how they support the openness at service/application level, reflected in the APIs-based interaction. Moreover, in Section 7.2 “Open Facility for a NetApp Ecosystem” details regarding the EVOLVED-5G facility and the individual architectural components will be provided.

3.2.3 Interactions with other 5G-PPP Projects

This section provides an overview of the interactions of the EVOLVED-5G Consortium with the other ICT-41 5G-PPP projects that have common objectives and scope. The aim is to establish connections, share information on project progresses and also plan joint activities in the form of joint scientific papers, the organization of joint workshops and technical panels organized in international conferences relevant to the projects.

In the light of the above, NCSR D partner has organized, chaired and participated in EVOLVED-5G Training Workshop “5G Programmability” at Athens Metropolitan College on March 21st 2021, presenting the EVOLVED- 5G project. In this workshop representatives of Smart5Grid (ATOS, ENEL) have also presented the framework of their project and the initial architecture of the NetApp.


Moreover, EVOLVED-5G is participating in the “ICT41-Cooperation”, an initiative that started at June 2022 with the aim to discuss proposals towards the cooperation of projects and organize physical meetings at events of common interest in order to promote standardization aspects that will consequently support the exploitation strategy. Additionally, other activities that the initiative is targeting, include the co-edit/author articles and whitepapers as well as the organization of workshops and seminars. An upcoming activity that has been discussed during the latest teleconference (12/07) is the participation in the 5G-PPP GA/TB meeting that will take place in Athens at 5th of October. The organization of a side meeting that will focus on the coordination of ICT-41 projects towards a joint standards contribution related to the NetApps, has been already proposed to the chairman of the Steering Board of 5GPPP.

3.3 EVOLVED-5G PRESENCE AT 5G-PPP CHANNELS






In the following sections, the 5G-PPP initiatives in which EVOLVED-5G has been involved up to M20 of the project, are described.

3.3.1 Evolved-5G in 5G-PPP Website

EVOLVED-5G is included in the project’s page of the 5G-PPP website <https://5g-ppp.eu/evolved-5g/>. Also, a dedicated 5G-PPP email has been assigned to the project: evolved-5G-Contact@5g-ppp.eu



Horizon 2020 call	H2020 - ICT- 2020
Topic	ICT-41-2020
Type of Action	IA
Duration	36 months
Start date	January 1 st , 2021
Project title	EVOLVED-5G: Experimentation and Validation Openness for Longterm evolution of Vertical Industries in 5G era and beyond

Website: <https://evolved-5g.eu/> Social Media:      Contact: evolved-5G-Contact@5g-ppp.eu

Abstract:

The intense ongoing work towards 5G readiness has reached the point where the performance gains provided by 5G infrastructures should be exploited by third party innovators and SMEs, to create a new, open and dynamic ecosystem from both technology and marketing perspectives. Towards the materialization of the 5G performance gains at application and market level, key contributions are expected by the domain of design and development of Network Application (NetApp). In this context, EVOLVED-5G endorses the vision where the world of NetApps follows the paradigm of mobile applications hosted in a related market place. Moreover, the EVOLVED-5G project will contribute towards the fourth industrial revolution or Industry 4.0. Recognized as one of the major vertical industries by 5G-PPP (referring to the digital evolving of workspaces), Industry 4.0 brings innovative use cases, yet technologically challenging, and create a fertile environment for SME-driven entrepreneurship, where new use

Figure 66: EVOLVED-5G project in the 5G-PPP website

NEF Emulator has been developed by NCSR “DEMOKRITOS” as an open-source project, that implements the standardized NEF APIs in a configurable emulated environment, where the user can define specific simulation parameters (e.g., number and type of UEs, position of gNBs etc.) and then the respective NetApp to be tested by interacting with the emulated exposed NEF APIs. The overall development of the NetApps during M20 of the project is being based on the functionalities that NEF Emulator provides. The NEF Emulator has been announced in the 5G-PPP website as can be seen in the figures below and can be found in the following link: <https://5g-ppp.eu/evolved-5g-builds-the-first-3gpp-nef-emulator-to-support-smes-on-5g-programmability/>

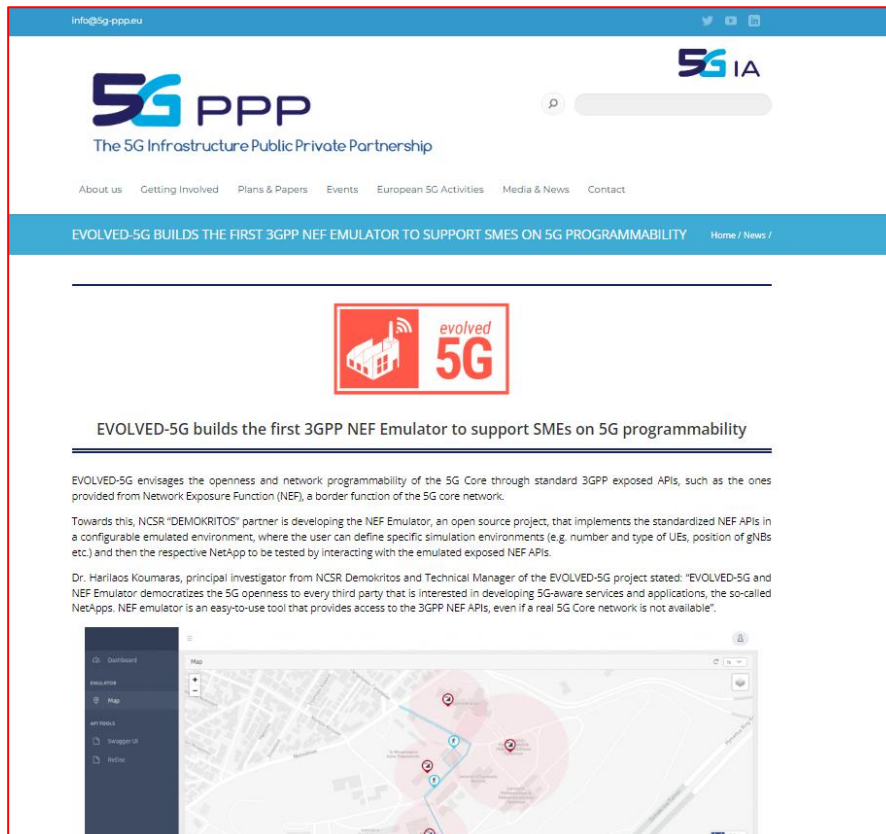


Figure 67: Announcement of EVOLVED-5G NEF Emulator in the 5G-PPP website

EVOLVED-5G project partners, Telefonica I+D and Fogus Innovations & Services P.C have developed the first release (Release 1.0) of the 3GPP CAPIF Core Function. CAPIF functionality is considered a cornerstone in the realization of 5G openness, since it allows secure exposure of 5G core APIs to third party domains, and also, enables third parties to define and expose their own APIs. In the light of the above, EVOLVED-5G project’s 3GPP CAPIF’s Core Function has been announced in the 5G-PPP website. <https://5g-ppp.eu/evolved-5g-announces-the-first-release-release-1-0-of-the-3gpp-capif-core-function/>

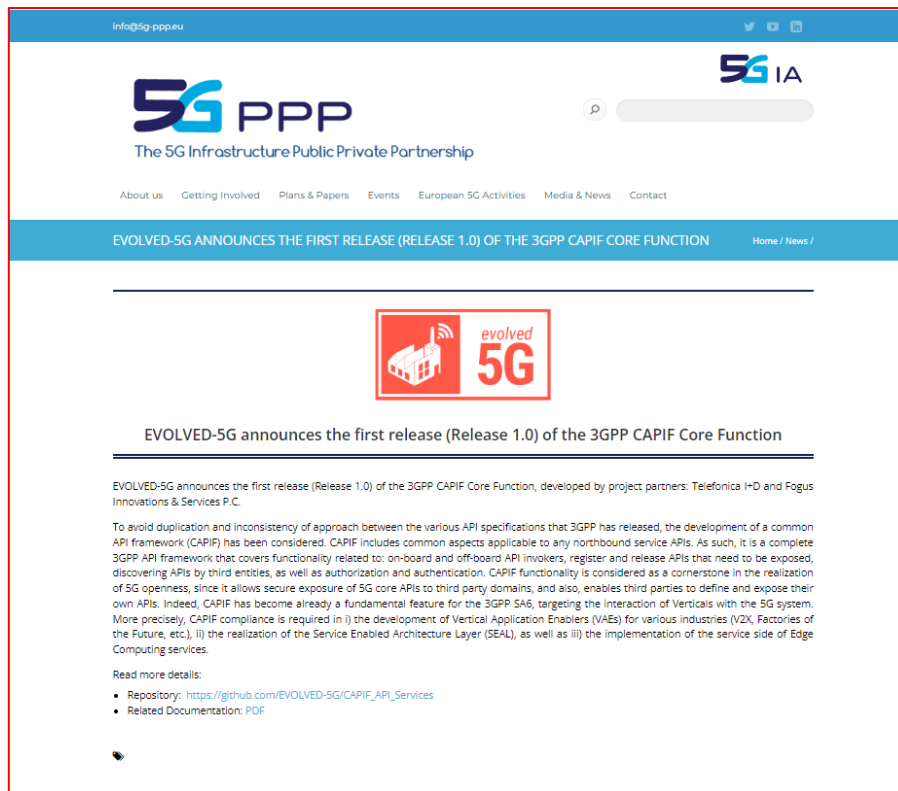


Figure 68: Announcement of 3GPP CAPIF's Core Function in the 5G-PPP website

3.3.2 5G-PPP social media channels

EVOLVED-5G from the beginning follows and tags the 5G-PPP social media channels:

- In Twitter the mention @5GPPP is added to all EVOLVED-5G tweets, which allows the 5G-PPP to easily spot and retweet EVOLVED-5G posts.
- In LinkedIn group EVOLVED-5G is able to post directly at 5G-PPP page and reach 5G-PPP's over 1,3K LinkedIn members/connections.

4 CONCLUSION

In this deliverable, EVOLVED-5G dissemination and communication activities, presentations and project's interaction and engagement activities in regard to 5G-PPP, up to M18 of the project, have been presented, analyzed and evaluated through the use of statistical dashboards and against the goals set by the EVOLVED-5G communication plan. In addition, communication plan and goals for next period's activities-Phase C (M19-M36) have been presented and set, enhancing the existing communication and dissemination plan of the project with the new objectives for the rest period of the project.

5 REFERENCES

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