



EVOLVED-5G NEWSLETTER #2 (April-June 2021)



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INSIDE THE ISSUE

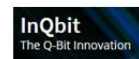
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ISSUE HIGHLIGHTS

The second issue of EVOLVED-5G Newsletter presents the project activities during the first period April-June 2021. This issue focuses on the communication and dissemination activities performed within this period, while also lists the respective deliverables and the conducted meetings.

In numbers, the EVOLVED-5G activities are:

- 2 Articles
- 2 Presentations
- 6 Press Releases
- 1 White Paper
- 1 EVOLVED-5G YouTube Video
- 5G-PPP Annual 5G Report
- 5G-PPP Brochure
- 4 5G-PPP Activities
- 1 Period Deliverable
- 3 Upcoming Deliverables
- 1 GA Plenary Meeting



Communication and Dissemination Activities

Articles

- Harilaos Koumaras from NCSR "Demokritos" explained, in an online article written in Greek, how the 5G technology will boost the new era of the Industry 4.0, while also sharing some useful insights about the EVOLVED-5G project. You may access and read the article [here](#).



- An interesting online article, written in Spanish, has been published by Universitat Politècnica de València (UPV) showcasing the objectives and the nature of EVOLVED-5G project. The article refers to the EVOLVED-5G aim to achieve the industrial revolution of the 21st century with smart factories. You may access it and read it online [here](#).



Presentations

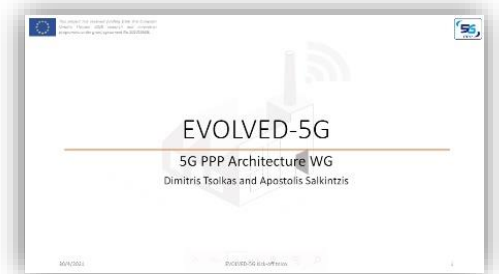
- **European Robotics Forum 2021**

PAL Robotics introduced the EVOLVED-5G project in the #ERF21 workshop "How to make an impact in EU projects", showcasing how EVOLVED-5G project will utilize NetApps for Industry4.0.



- **5G-PPP Architecture WG Presentation**

Dimitris Tsolkas from FOGUS and Apostolis Salkintzis from LENOVO presented the EVOLVED-5G Project in the 5G-PPP Architecture WG. During the discussion after the presentation, the contribution of EVOLVED-5G in the white paper that the group is preparing was agreed. This contribution will be related to the NetApp definition/implementation and interaction level with the 5G System. Stay tuned for upcoming material on this activity.



Press Releases

- EVOLVED-5G project has been officially announced in the Immersion (EVOLVED-5G partner) website. You may learn more about the project and the participation of IMMERSION in the following [link](#).



- EVOLVED-5G project has been officially announced in the PAL Robotics (EVOLVED-5G partner) website. You may learn more about the project and the participation of PAL Robotics in the following [link](#).



- EVOLVED-5G project has been officially announced in Maggioli website. You may learn more about the project and the participation of Maggioli in the following [link](#).



- EVOLVED-5G project has been officially announced in the QuComm (EVOLVED-5G partner) website. You may learn more about the project and the participation of QuComm in the following [link](#).



- EVOLVED-5G project has been officially announced at University of Málaga portal. You may learn more by clicking in the following [link](#).



- EVOLVED-5G Project has been announced in ENGINEERE website, showcasing the project's core principles. For more information about EVOLVED-5G Project follow the [link](#).



White Paper

- NCSRΔ and TELEFONICA, EVOLED-5G partners, have contributed in publishing the 5G IA white paper 'European Vision for the 6G Network Ecosystem'. Read the paper in the following [link](#).



1st EVOLVED-5G YouTube Video

- **EU H2020 EVOLVED-5G research project overview**
The first EVOLVED-5G video is a fact and is available at the project's YouTube channel! In this first introductory video, you may find an overview of the project along with all related information about its concept and objectives. You may access it on the EVOLVED-5G official YouTube channel and also by clicking [here](#).



More information about the EVOLVED-5G related news can also be found in the dedicated dissemination page at: EVOLVED-5G website at <https://evolved-5g.eu/dissemination/> and at the News webpage at <https://evolved-5g.eu/news/>

5G-PPP European 5G Annual Report 2021

- The European 5G-PPP Annual Journal of 2021 is now available! You may access it and find EVOLVED-5G project (pp 117-118) among other H2020 research projects. You may read it online [here](#).



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 emerging NetApp ecosystem under a twofold scope: i) to build an open experimentation facility for NetApp creation, validation, and certification, and ii) to provide the means and the tools for long term evolution of 5G-enabled vertical industries.

Irrefutably, the NetApp ecosystem will be beneficial for multiple and heterogeneous vertical industries. However, at project level, a single industry approach allows for clear contributions and deeper analysis of the expected impact. In view of this, EVOLVED 5G has strategically selected the vertical industry of smart manufacturing in the context of the Factory of the Future (FoF).

EVOLVED 5G objectives

The objectives of the EVOLVED 5G project are summarised below:

- 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.
- 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.

- 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, 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.

- 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).

EVOLVED 5G FoF applications

The EVOLVED 5G NetApp ecosystem will be the ground for the development of 11 FoF-related business applications based on the expertise that 11 SMEs²⁵ will bring to the project. The development of FoF applications will be organised around 4 major pillars of the manufacturing sector in the Industry 4.0 era, as explained in the table below.

²⁵ GIM AEROL, INTERNET INSTITUTE, COMMUNICATIONS SOLUTIONS AND CONSULTING LTD, CAFA TECH OÜ, INOBIT INNOVATIONS SRL, FOCUS INNOVATIONS & SERVICES P.C., INFOYSIS P.C., EIGHT BELLS LTD, PAL ROBOTICS SL, QUCCOMM IDIOTIKI KEFALAIORIKI ETAIREA, IMMERSION, UNMANNED SYSTEMS OÜ.

Pillar	Target FoF Application
Innovation in the interaction of employees and machines through AR features and remote-control capabilities	Intent-driven Chatbots for precise maintenance Haptic-driven console for industrial surface repairing (hot bonding) Mixed Reality (MR) assisted manufacturing
Efficiency in FoF operations with novel predictive maintenance applied on digital factory twin	IoT/M2M-based remote monitoring platform AI based video analyser for industrial and robotics safety ML-driven anomaly detection system for Industrial Processes
Security guarantees and risk analysis for the FoF communication and management systems	L7-aware Whitebox Switch with Dynamic SFC and TSN Support SIEM (Security information and event management) system Blockchain Data Brokerage Engine
Agility in the production line infrastructure through automation and robotic parts	AI-driven Humanoid robots AI-driven logistics robotic fleets

Table 6: The four major pillars of the manufacturing sector in the Industry 4.0 era

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

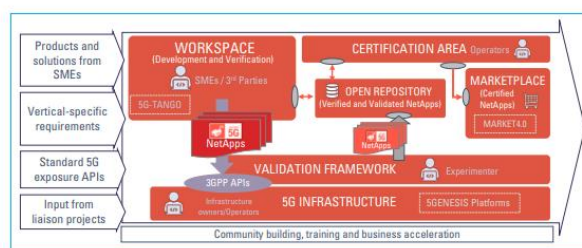


Fig. 62: EVOLVED 5G Approach

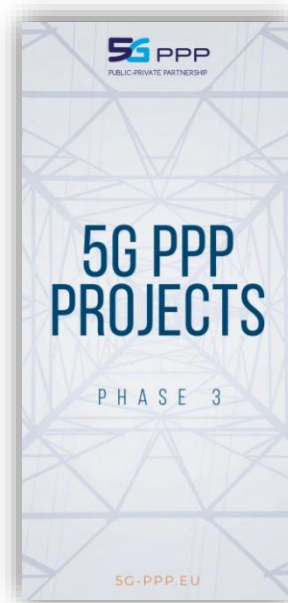
EVOLVED 5G has just started

EVOLVED 5G project started on January 1, 2021 and it is currently working on the definition of the reference architecture that will serve as the implementation blueprint of the EVOLVED 5G facility. In the next coming months, the EVOLVED 5G team will work intensively around the overall

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 methodology needed for the integration between the NetApps workspace and Athens and Málaga 5G experimental facilities.

5G-PPP Phase 3 Projects Brochure of June 2021

- EVOLVED-5G Project's main goals and objectives along with the involved applications and the expected impact of the project were introduced in the 5G-PPP, Phase 3 Projects Brochure of June 2021. You may access the Brochure and read more information about the EVOLVED-5G, among other projects, in the following [link](#).



EVOLVED-5G

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

Coordinated by Javier Garcia Rodrigo (TID S.A.U.)

January 2021 → December 2023

@evolved5g evolved-5g.eu



MAIN OBJECTIVES & CHALLENGES

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 case-tailored functions (as NetApps) can be provided to compose a digitalized, secure, and automated generation of the industrial operations (mainly referring to functions for process and machine control as well as procedures for advanced product lifecycle management). The industry-oriented EVOLVED-5G NetApps will be tested, validated, and certified in a vendor-agnostic experimentation platform, and progressively define the first set of NetApps that the EVOLVED-5G marketplace will host.

APPLICATIONS & EXPECTED IMPACT

EVOLVED-5G will disrupt the market of MNOs and Industry 4.0 vendors by: (i) 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, (ii) Launching the NetApp Open Repository and Marketplace for the Industry 4.0 vertical industry, introducing new business models and value chains for MNOs, (iii) 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: (i) Impact on Smart Manufacturing Vertical Industry (Factories of the Future -- FoF --), (ii) Impact on App Market: Network-driven Apps (NetApps), (iii) Impact on MNOs' Value Chain: A business model for service providers, (iv) Impact on Market and Economy: 5G conquer of ICT market, (v) Impact on Society and Economy: Boosting European Competitiveness

VERTICAL USE CASES ADDRESSED IN THE 5G-PPP





5G-PPP Activities

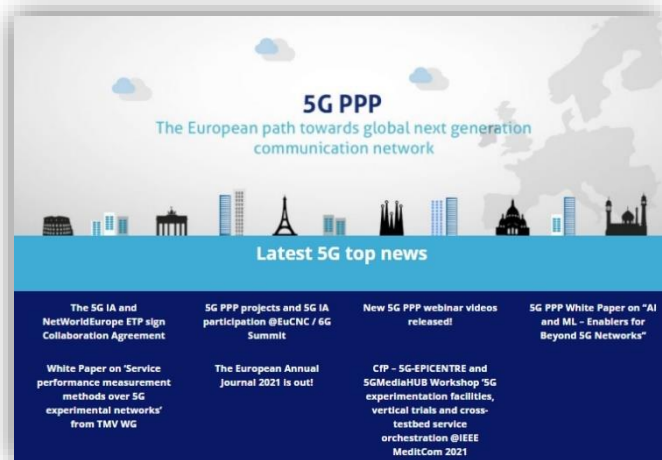
➤ 5G-PPP Newsletter Issue 24

The latest Newsletter issue (April 2021) of 5G-PPP is available online at the 5G-PPP website:
<https://5g-ppp.eu/newsletter-24-april-2021/>

➤ 5G-PPP Newsflash Issues

The latest newsflash issues of 5G-PPP are available online and can be found at the 5G-PPP website from the following links:

- Newsflash Issue 58 (March 2021):
<https://5g-ppp.eu/newsflash-march-2021/>
- Newsflash Issue 59 (April 2021):
<https://5g-ppp.eu/newsflash-april-2021/>
- Newsflash Issue 60 (May 2021):
<https://5g-ppp.eu/newsflash-may-2021/>



Period Deliverables

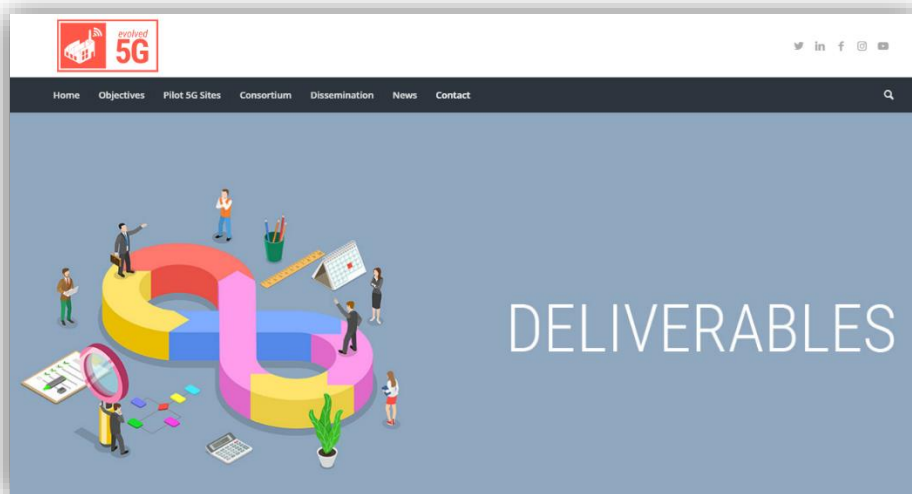
D7.1 Dissemination, Communication and 5G-PPP Engagement Plan [M6]: This deliverable is led by INF partner and describes the initial plans on the dissemination, communication and 5G-PPP engagement activities.

Upcoming Deliverables

D2.1 Overall Framework Design and Industry 4.0 requirements [M9]: This deliverable will report the overall design of the whole system, including the first version of the functional and non-functional requirements, and the monitoring methodology followed in the development phase.

D2.2 Design of the NetApps development and evaluation environments [M10]: This deliverable will provide a description for the workspace for NetApps development and for the validation and certification process.

D7.2 Standardisation, Innovation, Exploitation and Technology Transfer plan [M10]: Plan on the innovation, exploitation as well as standardization activities of the project.



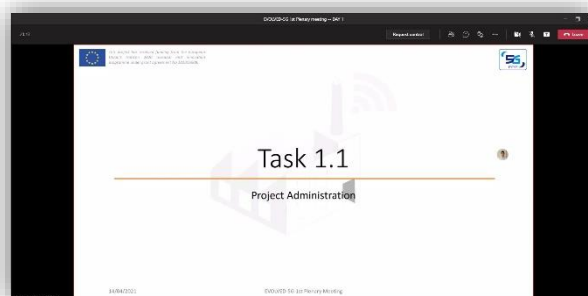
All the public EVOLVED-5G deliverables are available for downloading at the EVOLVED-5G website in the deliverables page: <https://evolved-5g.eu/dissemination/deliverables/>.

1st GA Plenary Meeting

The EVOLVED-5G first GA plenary meeting was organized and conducted remotely, due to the COVID-19 impact and safety restrictions that apply worldwide!

This virtual GA meeting ran for 2 days, 14-15 Apr 2021, discussing about the project's progress within the initial period of the first 3-mths.

Among several detailed discussions, WP and task related activities, NetApp functions, and the new goals to be met over the next period, were discussed. Besides the technical progress and goals, the communication and dissemination activities were also analyzed, setting the path for the upcoming period. Last but not least, for the better coordination of the project, the discussion about the submitted and upcoming deliverables was also part of the agenda.



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Start Date: 1 January 2021

