



A Holistic, Innovative Framework for the Design,
Development and Orchestration of 5G-ready
Applications and Network Services over Sliced
Programmable Infrastructure

DELIVERABLE D7.3

COMMUNICATION ACTIVITIES REPORT - HALFWAY

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Executive Summary

This deliverable D7.3 “Communication Activities Report - Halfway” presents the MATILDA communication results since the beginning of the project, 1 June 2017, up to August 2018. This Deliverable is the first version of the Communication Activities Reports, to be followed by D7.7 “Communication Activities Report - Final” at M35 of the project.

This document reports the activities Task 7.3 “Communication Activities”, that is part of the work addressed within the more general scope of WP7 “Dissemination, Communication, Exploitation and Business Planning”. The latter is, indeed, a crucial WP, since communication, dissemination and exploitation activities are among the most important elements for a successful and durable project.

This deliverable has no direct interdependency with other specific tasks of the workplan, because the communication process is a horizontal activity; its aim is mainly to highlight the communication activities achievements in order to evaluate their effectiveness.

During the reporting period, the MATILDA communication activities covered two main points:

- Defining and deploying the collaboration and communication tools necessary to the MATILDA Consortium partners for an efficient work;
- Communication of MATILDA efforts through its official website and social media.



1 Introduction

According to the objectives described in D7.1 “Communication Roadmap”, the core objective of the MATILDA communication activities is to increase the project visibility to the identified target groups, highlighting the main progresses, the results achieved and the future plans.

This activity needs a particular care and its success in attracting the stakeholders’ interest, among the huge amount of information around, is tied to a strong effort in planning, implementation and verification of the communication activities put in place. To this purpose the target Key Performance Indicators (KPIs) are progressively evaluated and the comparison trends are object of analysis and appropriate consequent actions. Several different means and media are used by the MATILDA Consortium for communication and promotion, comprising online, face to face and written communication channels.

This deliverable constitutes the first of two project communication reports, marked as public, and it covers the activities between 1 June 2017 and 31 August 2018. This deliverable refers to the roadmap defined in D7.1; since D7.1 is marked as confidential, relevant information from the original document has been enclosed, where appropriate, in the current document, which is open to public readers. This report is a direct output of Task 7.3 “Communication Activities and Data Management” and it complements the corresponding report D7.2 “5G-PPP Interaction, Dissemination, Clustering & Standardisation Activities Report - Halfway”, which describes the activities of Task 7.1 “Dissemination, Clustering and Standardization Activities”.

The document is structured in three main sections: *i)* introduction and purpose, *ii)* review of the MATILDA communication means, including, where appropriate, an evaluation based on the defined KPIs, *iii)* conclusions.

1.1 Purpose and Scope

Communication activities are of crucial importance for the success of the project, whose mission, beside technical and scientific achievements, is indeed the successful diffusion of knowledge, in order to raise awareness and engagement of potential supporters, end users and customers. To this purpose, MATILDA leverages on all the most suitable tools, from electronic and printed means to the project portal, from social media to the delivery of customised (to the audience) presentations, and so on.

The main objectives of this report are:

- Providing information about progresses in the communication of MATILDA’s outcomes.
- Providing an assessment of the effectiveness of the communication roadmap (see D7.1) against the specified KPIs’ quantitative metrics.



2 MATILDA Communication Roadmap

The MATILDA communication roadmap defined the deliverable D7.1 is the main and key strategy source for the communication activities within the project. For this reason, the communication plan has been prepared and released very early in the project life (M3) as it constitutes the foundation of WP7, by defining a clear strategy in terms of responsibilities, scheduling, tools and communication channels.

The main objectives of the MATILDA communication plan are to:

- Catch the attention at the local, National and International levels about the project scope and outcomes
- Increase the MATILDA Consortium partners' reputation and visibility
- Generate industrial interest
- Generate market demand
- Facilitate the networking activity with potential partners for future collaboration including gifted scientists interested in joining the consortium's institutions and enterprises

Considering that that WP1 "MATILDA Reference Architecture, Conceptualization and Use Cases" ends on M15, most of the consortium's communication and dissemination activities have been focused on the theoretical aspects and characteristics of the project. Additional activities were focused mainly on establishing the communication tools which enable communication with interested organisations, projects, communities or even individually.

The main communication items and channels covered in the current document are the following:

- Project Logo
- Project Website
- Social Media
- Project Poster
- Project Flyer
- Online Publications
- Press releases
- Newsletters

For each of the aforementioned item/channel, in the following sections we provide a concise description and, where relevant, additional information such their measured impact in terms of KPIs or references to the websites where they have been published.

3 Project Logo

The official MATILDA project logo is depicted in Figure 1 and Figure 2, in horizontal and vertical version, respectively.

MATILDA name and logo has been initially inspired by the young, and genial, girl interpreter of the namesake movie. The graphic of the logo has been then further elaborated and abstracted and it is now so sketched that it can remind an orange-similar cloud shape over a cyan server, representing the concept of network-aware applications deployed on a programmable infrastructure, but designed and implemented in a holistic 5G operational framework that spans cloud, edge, MEC, NFV, etc.

Different versions of the original logo have been prepared to fit better to the characteristics of different communication channels, such as website and social networks.



Figure 1: Horizontal version of MATILDA logo



Figure 2: Vertical version of MATILDA logo

4 Project public website

The MATILDA public website is reachable at the following URL: <http://www.matilda-5g.eu>.

The public website collects and presents the public information about the project. It has been conceived both to provide the largest possible audience to the external communication activities, as well as an effective instrument for the dissemination of the project outcomes.

The MATILDA public website is as a user-friendly communication means designed and implemented with high usability standards in mind. The first version of the public website was launched early in July 2017, based on the Content Management System (CMS) *Joomla!* and using a template that is able to adapt the site layout to well fit both the standard PC monitors and the smartphone/tablet smaller screens. The website will be progressively updated and enriched during the whole project lifetime, presenting the project outcomes under the responsibility of WP7 leader.



Referring to the communication plan defined in D7.1, the MATILDA public website is one of the main communication channels¹ with which the project can expose the most relevant information to the wide public.

The public area comprises the following sections, accessible from the main menu:

- Home
- Vision
- Use-cases
- Outcomes
- News
- Partners

while the following sections have been highlighted in a dedicate stripe with icon menu:

- Our Vision
- Who We Are
- Latest News
- Flyers & Newsletters



Figure 3: The MATILDA public website, a snapshot of the homepage

¹ See for the entire list sec. 5 “Communication Channels” in D7.1 “Communication Roadmap”, p. 14.



The screenshot shows the MATILDA public website interface. At the top, there is a navigation bar with the MATILDA logo and menu items: HOME, VISION, USE-CASES, OUTCOMES, NEWS, PARTNERS, and a hamburger menu icon. Below the navigation bar is a blue header section titled 'Flyers & Newsletter' containing two icons: 'Project Leaflet' and 'Project Newsletter'. The main content area is divided into three sections: 'Latest News', 'Tweets', and a partially visible 'Partners' section at the bottom.

Latest News

- 28 August 2018: MATILDA review meeting
- 27 July 2018: 5GNetApp Workshop at IEEE SDN-NFV 2018
- 05 June 2017: Matilda Kickoff

Tweets

- August 01 2018: Matilda communication: Matilda Poster #NFV #5G #Cloud #MEC #NetworkSlicing pic.twitter.com/POdJGVEdDb
- July 24 2018: 5GNetApp Workshop on '5G-ready Network Applications and Services Development and Orchestration over Application-awa... twitter.com/v/web/status/1...
- July 24 2018: Call for Papers for the 5GNetApp Workshop supported by the H2020 5G-PPP Projects MATILDA and 5GTANGO... twitter.com/v/web/status/1...
- May 25 2018: Matilda's plenary meeting at the Atos premises in Madrid coming to its conclusions: three days of very effective di... twitter.com/v/web/status/9...
- May 24 2018: Second day of Matilda's plenary meeting at the Atos premises in Madrid #NFV #5G #Cloud #NetworkSlicing pic.twitter.com/xO8t5BuSxw

Figure 4: MATILDA public website, a snapshot of the “Flyers & Newsletters”, “Latest News” and “Tweets” sections

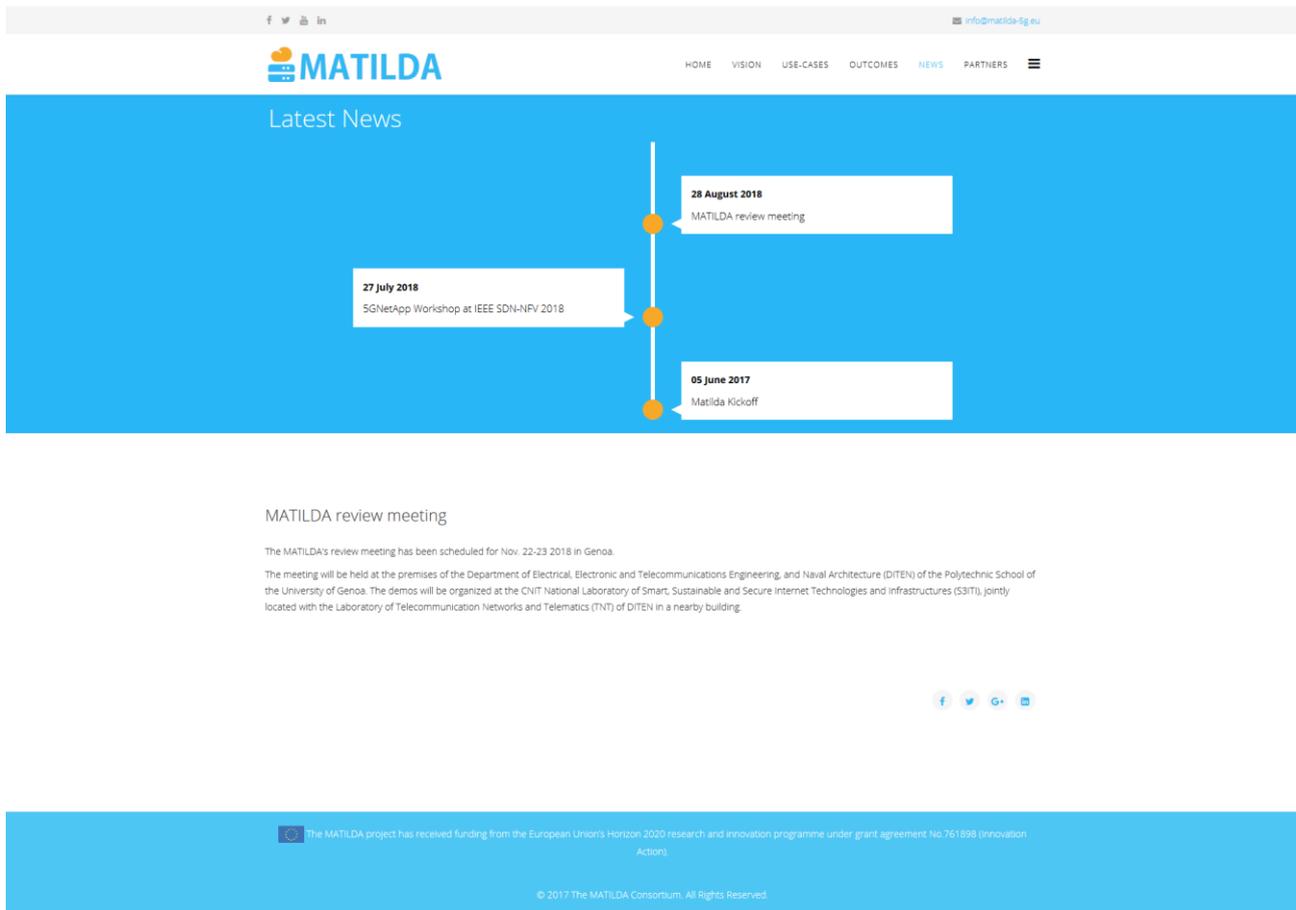


Figure 5: MATILDA public website, a snapshot of the “News” section

4.1 Communication Activities

The public website is intended to be a privileged showcase for publicizing and disseminating the research activities carried out in the project.

The MATILDA partners have committed themselves to add into the public website any communication activity that they realize, by means of the dedicated form accessible from the private area. All the communication activities are gathered and listed in the “Dissemination and Communication Activities” table under the “MATILDA Outcomes”² section; some of them have been also emphasized with a dedicated *news* or *tweet*.

During the first phase of the project, news have been published as tweets (see Figure 4); subsequently, upon suggestion of the reviewers, to separate sections for news and tweets have been introduced (see Figure 5).

² <http://www.matilda-5g.eu/index.php/outcomes>



4.2 Progress against KPIs

Website analytics provides an essential tool to monitor number of visits, number of unique visitors, number of downloads, visitors' distribution, and so on.

The following tables and figures present several statistics from the website for the period spanning from February 2018³ to August 2018.

Table 1 reports the total number of visits per month for the MATILDA public website. In Figure 6, it is possible to better appreciate the positive trend of the monthly visits in a graphical representation.

Table 1: Number of website visitors

Month	Visits
February	504
March	1235
April	988
May	1967
June	3453
July	2836
August	2684



Figure 6: Visitors' trend graphical representation

³ The MATILDA public website is online since the start of the project, early in July 2017, but the statistics about visitors have been kept and analysed starting from February 2018.



It is indeed interesting to consider also the number of unique visitors by referring to following Table 2 and Figure 7, which show again a positive trend in the numbers of visits.

Table 2: Number of website unique visitors

Month	Visits
February	187
March	443
April	306
May	1062
June	1179
July	1435
August	1364



Figure 7: Unique visitors' trend graphical representation



The visitors' distribution per country is represented in Figure 8, while in Table 3 the number of public documents' downloads is reported.

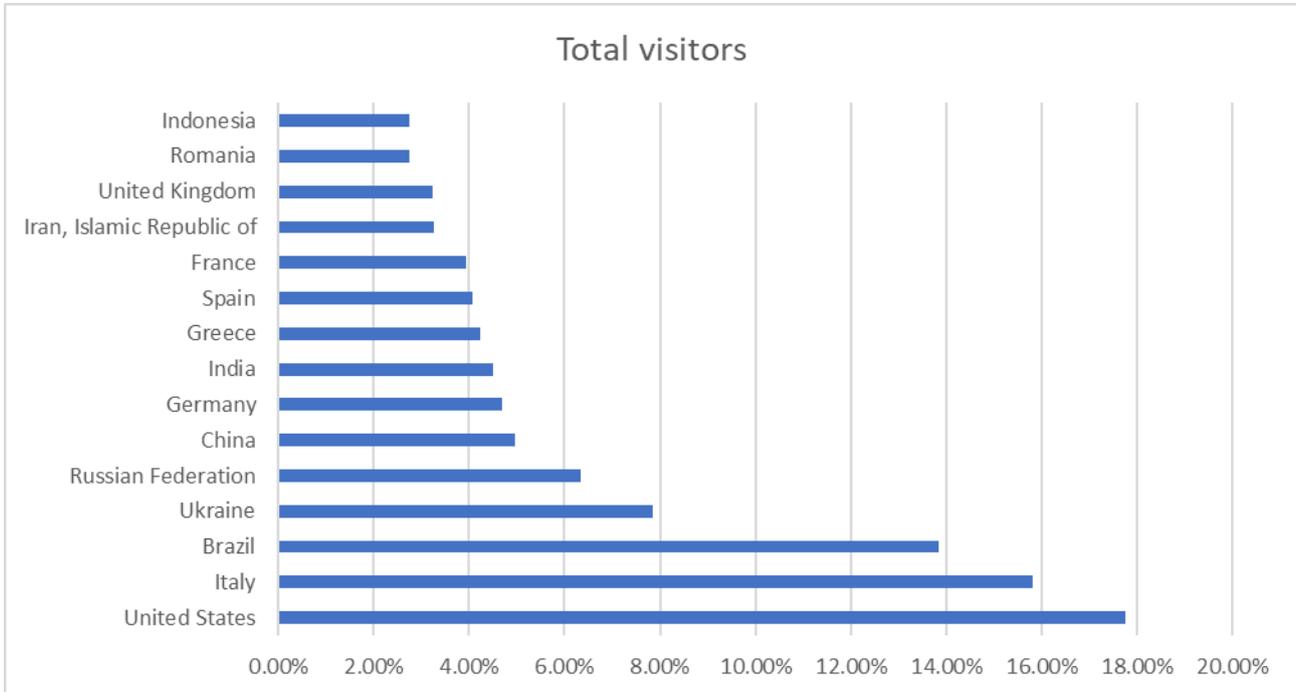


Figure 8: Visitors' distribution per country

Table 3: Public documents' downloads

Public Document	Downloads
D1.1 - MATILDA Framework and Reference Architecture	235
D1.2 - Chainable Application Component & 5G-ready Application Graph Metamodel	152
D1.3 - VNF/PNF & VNF Forwarding Graph Metamodel	144
D1.4 - Network-aware Application Graph Metamodel	130
D1.5 - Deployment and Runtime Policy Metamodel	109
MATILDA Flyer	292
MATILDA Newsletter - Issue 1	96



Table 4 reports the main KPIs that have been defined in the project’s communication roadmap (see deliverable D7.1) with regard to the public website.

Table 4: MATILDA public website KPIs

Communication means	KPI	Target range (throughout project lifetime)
MATILDA public website	Number of project updates	≥ 20
	Average number of views per project update	≥ 500
	Number of distinct visitors	≥ 2000
	Number of downloads of online material	≥ 5000

According to the statistics presented above in this section, the MATILDA public website is well on track and even exceeded the expectations; therefore, it can be deemed to be serving its purpose and to be capable of attracting readers and maintaining their interest.

5 Social Media

Several social media have been used for a better project communication and also to increase the experiences and knowledge exchanges among professionals and stakeholders.

To this aim, four different accounts have been created on:

- Twitter
- LinkedIn
- YouTube
- Facebook

Twitter is indeed one of the best media for conveying short messages to followers and therefore is considered crucial, especially during events where the consortium activity is advantageous to be populated instantly. YouTube is a great way to share MATILDA’s videos to a larger audience and will be more intensively used in the second part of the project, when the theoretical activities will leave room to implementation and demonstrations.

Consolidated experience with social media has demonstrated that messages need to be customized to the social used and to the different audience (for example, Twitter users tend to more “dynamic” than those of other social media). For this reason, recycling of messages among different socials has been avoided.

The primary Point of Contact (PoC) for the management of the MATILDA social media is Mr. Orazio Toscano (ERICSSON), who takes care of maintaining the social media accounts of MATILDA, providing updates on project events and responding to any post or question with the help of the whole consortium, to find out and invite people potentially interested in the project outcomes and to suggest any other important source of information.



5.1 Twitter

The MATILDA's Twitter account username is **@matilda5g**, and its homepage is reachable at the following URL: <https://twitter.com/matilda5g>.

Twitter is considered very important to inform our followers with updated information about the MATILDA project's progresses and activities. Moreover, it allows MATILDA to follow other related projects and initiatives.

At present, MATILDA is following 81 Twitter accounts, related to other pertinent innovative projects, open source communities, magazines, journals, and highly innovative companies.

As of the time of writing, MATILDA's Twitter account has 103 followers (see Figure 9).



Figure 9: MATILDA's Twitter account

Hereinafter, we present some statistics and analytics data gathered from Twitter Analytics, the official Twitter site for statistics and audience concentrations. The reference period consists in the last 28 days as of the time of writing, which roughly corresponds to the entire month of August 2018.

In Figure 10, the general summary shows a significant improvement in the number of followers, in the number of overall visits and in the overall number of tweets' impressions.

Figure 11 and Figure 12 depict more in details the statistics related to the number of the tweets' impressions and the audience insights graph, respectively. It is worth noting the gain of 8 new followers and the rewarding number tweets' impressions in the considered period, whose statistics, falling in the month of August, could have been negatively impacted by the summer vacations.

Particularly interesting is the list of the three top tweets reported in Figure 13, which reveals a great interest in the MATILDA poster.

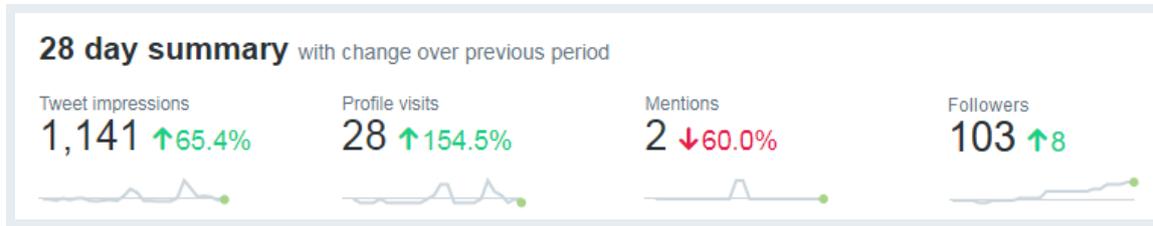


Figure 10: MATILDA's Twitter statistics summary over a period of 28 days

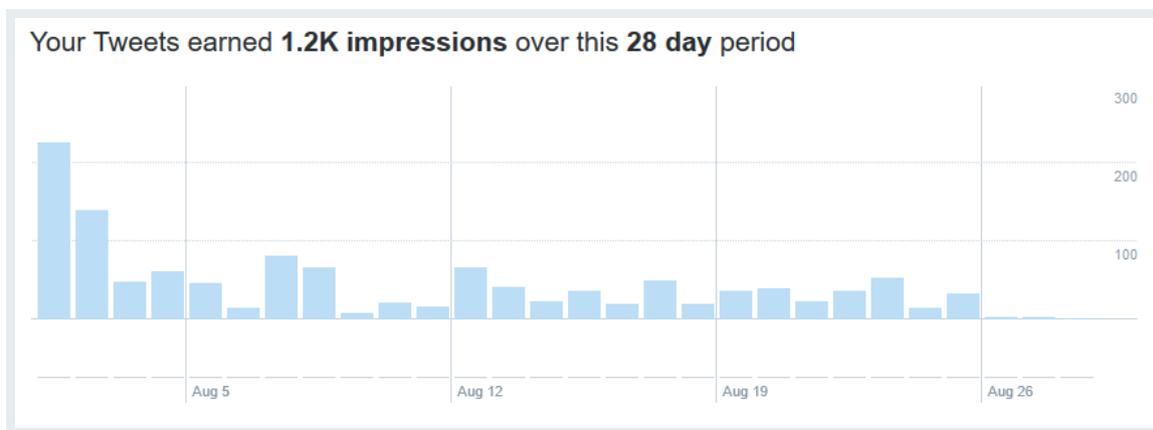


Figure 11: MATILDA's Twitter impressions over a period of 28 days

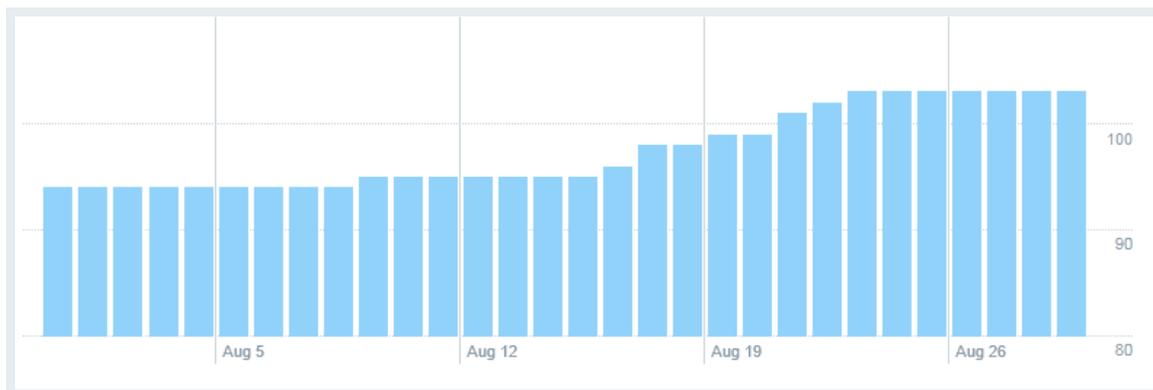


Figure 12: MATILDA's Twitter audience insights over a period of 28 days

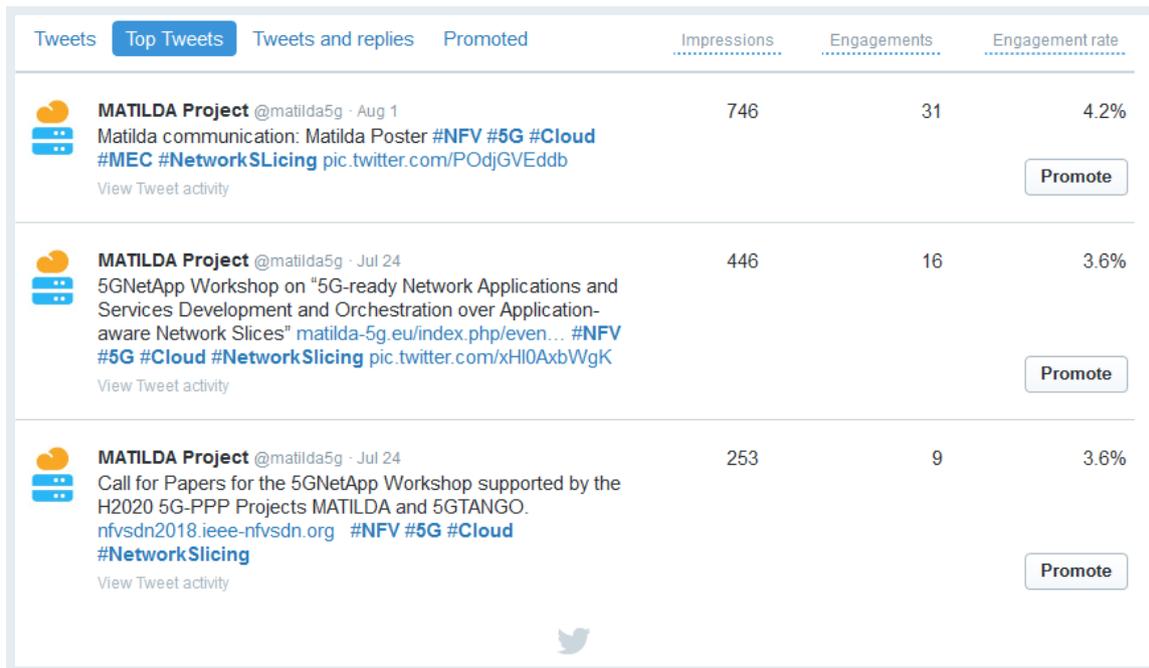


Figure 13: MATILDA top tweets

Table 5: MATILDA’s Twitter KPI

Communication means	KPI	Target range (throughout project lifetime)
MATILDA Twitter account	Number of followers	≥ 200

Considering the target values for the MATILDA’s Twitter account KPI reported in Table 5 and the statistics presented above, the MATILDA’s Twitter account appears to be well on track and to serve its purpose effectively.

5.2 LinkedIn

The MATILDA’s LinkedIn profile is named **Matilda Project**, and its homepage is reachable at the following URL: <https://www.linkedin.com/in/matilda-project-a43b6114a/>.

As of the time of writing, the MATILDA LinkedIn site has got 27 connections (see Figure 14).

Taking into account that the best potential in promoting milestone achievements in the lifetime of the project will become available during the second part of MATILDA and that, so far, Twitter has been more intensively used for announcing project related events, followers are expected to increase in the next part of the project, as more interesting results will emerge during the implementation phases.

In the second part of the MATILDA project, it is anyway expected to devote more efforts in enhancing the engagement of LinkedIn users and generating discussions and sharing of knowledge.

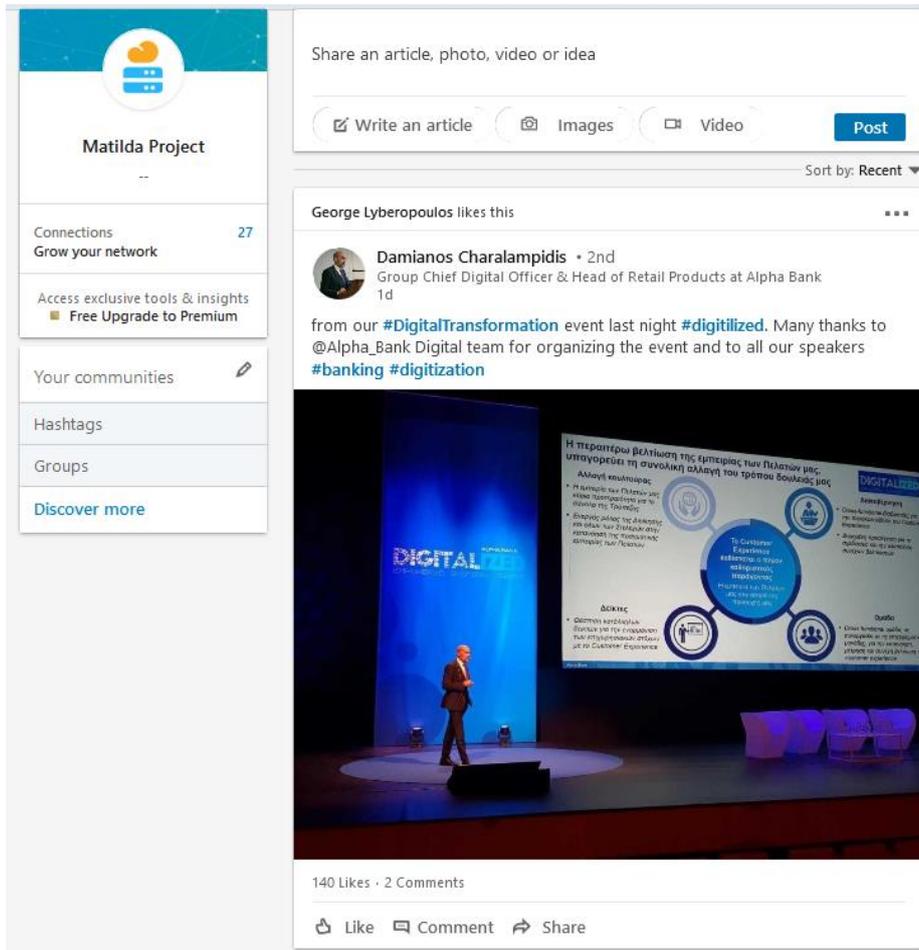


Figure 14: MATILDA's LinkedIn homepage

Table 6: MATILDA's LinkedIn KPI

Communication means	KPI	Target range (throughout project lifetime)
LinkedIn MATILDA group	Number of group members	≥ 300

5.3 YouTube

The MATILDA’s YouTube channel is named **Matilda Project**, and its homepage is reachable at the following URL: <https://www.youtube.com/channel/UCFbGjARCa32akAXIVKy7-1Q>.

As of the time of writing, the MATILDA YouTube channel analytics showed 92 views for the introductory video of the project (Figure 15), which has been published on 1 August 2018.

Considering that the first part of the project has been mainly focused on the architectural aspects and the first available video has been only recently uploaded, this is an encouraging result. Of course, better chances in promoting implementation and demonstration videos will arise during the second part of MATILDA. Nevertheless, the achieved results appear to be in track with the expected target presented in Table 7.



Figure 15: MATILDA’s YouTube page

Table 7: MATILDA YouTube KPI

Communication means	KPI	Target range (throughout project lifetime)
MATILDA YouTube channel	Number of views	≥ 300

5.4 Facebook

The MATILDA’s Facebook profile is named **Matilda Eu**, and its homepage is reachable at the following URL: <https://www.facebook.com/matilda.eu.37>.

As in the case of many similar projects, the MATILDA’s Facebook social account has been scarcely used, in part due to the fact that the MATILDA website and the other social media already provided good communication opportunities and in part also for its mediocre vocation for scientific matters.

Therefore, a revised reduced Facebook target KPI is foreseen for the following part of the project, even if more effort will be dedicated in enhancing the MATILDA’s Facebook account page.



Figure 16: MATILDA’s Facebook homepage

Table 8: MATILDA YouTube KPI

Communication means	KPI	Target range (throughout project lifetime)
Facebook MATILDA relations	Number of relations	≥ 200



6 Project Poster

The MATILDA's poster has been released after the end of the architectural phase and included information regarding the framework's architecture, the application-aware network configuration, along with some general content.

In particular, the poster provides information about (see Figure 17):

- What is MATILDA: brief introduction to the MATILDA project
- Highlights: including main project benefits
- Partners and project details: including duration, Grant Agreement number, budget, and contact details
- Conceptual diagrams of the MATILDA high level architecture and of the Application-Aware Network Configuration

The poster has been disseminated through our social media accounts, and a printed version will be used to help dissemination in public events.

7 Project Flyer

The MATILDA's flyer has been conceived and designed to support the communication and dissemination activities. It was prepared and released in an initial version in January 2018 and an upgraded version has been released in June 2018.

The flyer has been designed as a three-column brochure in A4 size format.

This first version of the flyer provided information about (see Figure 18 and Figure 19):

- MATILDA Key Targets
- MATILDA Consortium and Contact Details
- MATILDA Main Vertical Demos
- MATILDA High Level Architecture
- MATILDA Top Deliverables

The second version of the flyer provided information about (see Figure 20 and Figure 21):

- MATILDA Key Targets
- MATILDA Consortium and Contact Details
- MATILDA Main Vertical Demos
- MATILDA Key Impact on Stakeholders
- MATILDA Goals
- MATILDA Architectural Framework

As of the time of writing, the project flyer has been downloaded 292 times.



MATILDA

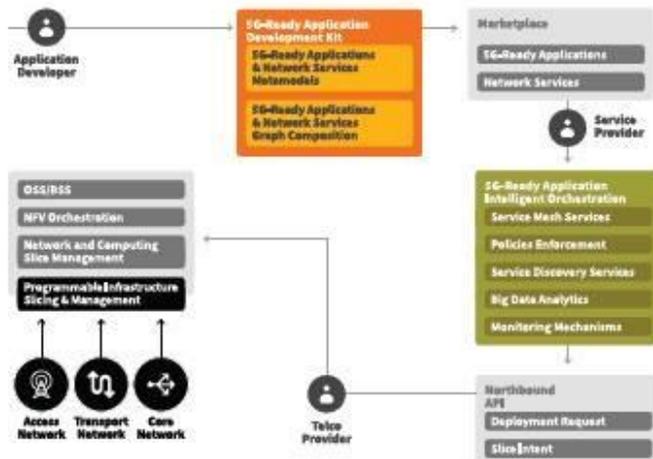
A Holistic, Innovative Framework for Design, Development and Orchestration of 5G-ready Applications and Network Services over Sliced Programmable Infrastructure

Design, develop and deploy 5G-ready applications over application-aware network slices.

MATILDA comes up with a **novel and holistic approach** for tackling the overall **lifecycle of applications' design, development, deployment and orchestration** in a 5G ecosystem. MATILDA aims to devise and realize a **radical shift in 5G-ready vertical applications**, intrinsically **bridging cloud-native applications and network service domains**.

It follows a **top-down approach** where **applications design and development** leads to the **instantiation of application-aware network slices**, over which vertical industries applications can be optimally served. **Different stakeholders (application developers, service providers, telco providers)** are engaged in this process, however with **clear separation of concerns** among them.

High Level Architecture



Highlights

- ✎ **Design and develop 5G-ready applications;** applications able to take advantage of 5G programmable infrastructure.
- ✎ **Optimally manage and provide services/applications** through a set of **intelligent orchestration mechanisms**.
- ✎ **Dynamically create and manage application-aware network slices** able to serve 5G-ready application needs.
- ✎ **Separation of concerns** among vertical applications and network services orchestration.

Project Details

Start Date: 2017-06-01
End Date: 2019-11-30
Duration: 30 months
Total Cost: € 8,378,945.36
EC Funding: € 6,664,458.75

URL: <http://matilda-5g.eu>

MATILDA has received funding from the European Union's Horizon2020 Research and Innovation Programme, under Grant Agreement no. 761838.

Project Partners











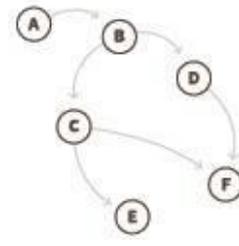






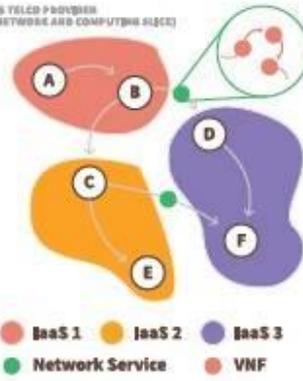
Application-aware Network Configuration

SERVICE PROVIDER (VERTICAL APPLICATION ORCHESTRATOR)



○ Application Component

5G TELCO PROVIDER (NETWORK AND COMPUTING SLICE)



● IaaS 1 ● IaaS 2 ● IaaS 3
● Network Service ● VNF

Figure 17: MATILDA poster



KEY TARGETS

- Improve performance, security and reliability** specific requirements, by handling optimization mechanisms based on high level objectives and runtime adaptation of the application components and network functions based on defined policies.
- Shorten time to market:** MATILDA will provide a novel holistic 5G end-to-end service operational framework tackling the overall lifecycle of the design, development and orchestration of 5G-ready applications and 5G network service over programmable infrastructure.
- New business opportunities:** MATILDA will allow customization of application-aware network slices in order to support industry vertical applications in a optimal way.
- Environmental friendship:** based on the optimal use of the underlying infrastructure resources.





A HOLISTIC, INNOVATIVE FRAMEWORK FOR THE DESIGN, DEVELOPMENT AND ORCHESTRATION OF 5G-READY APPLICATIONS AND NETWORK SERVICES OVER SLICED PROGRAMMABLE INFRASTRUCTURE

Project Coordinator: Prof. Franco Davoli (University of Genoa, Italy)

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MATILDA has received funding from the European Union's Horizon2020 Research and Innovation Programme, under Grant Agreement no. 761898.




Figure 18: MATILDA Flyer, 1st version, p.1

MAIN VERTICAL DEMOS

- HIGH RESOLUTION MEDIA ON DEMAND
- DISTRIBUTED SYSTEM TESTING
- 5G EMERGENCY INFRASTRUCTURE
- INDUSTRY 4.0 SMART FACTORY
- SMART CITY INTELLIGENT LIGHTING SYSTEM

HIGH LEVEL ARCHITECTURE

APPLICATIONS LAYER	SMART CITIES EMERGENCY CITIES APPLICATION GRAPHS	MEDIA AUTOMOTIVE NETWORKS REQUIREMENTS	INDUSTRY 4.0 5G-READY APPLICATIONS
ORCHESTRATION LAYER	NETWORK-AWARE APPLICATION GRAPHS	MACHINE LEARNING OPTIMIZATION RUNTIME POLICIES ENFORCEMENT CONTEXT-AWARENESS	INTELLIGENT ORCHESTRATION MECHANISMS
NETWORK FUNCTIONS AND SERVICES MANAGED LAYER	VIRTUALIZED RESOURCES PHYSICAL RESOURCES	SDN NFV NFV	APPLICATION-AWARE NETWORK SLICES
INFRASTRUCTURE LAYER	5G-NR	EDGE-FED COMPUTING EDGE NETWORKS	CLOUD COMPUTING TRANSPARENCE NETWORKS

TOP DELIVERABLES

- A conceptual architecture for supporting the provision of 5G end-to-end services tackling the overall lifecycle of design, development and orchestration of 5G-ready applications and 5G network services over programmable infrastructure.
- A set of metamodels representing the vertical industry applications' components and graphs, the virtual -and physical- network functions and forwarding graphs.
- An innovative collaborative development environment supporting the design and development of 5G-ready applications and VNF-FGs, including a web-based IDE, verification and graphs composition mechanisms.
- An orchestrator that undertakes the responsibility of optimal deployment and orchestration of the developed applications over the available programmable resources. Policies enforcement is going to be supported by a context awareness engine, able to infer knowledge based on a set of data monitoring, analytics and profiling production streams.
- A multi-site virtual infrastructure manager, along with a multi-site NFVO supporting the lifecycle management of the network functions embedded in the deployed application graph, as well as supporting a set of network monitoring and management mechanisms.
- Novel analytics and unified profiling framework consisting of a set of machine learning mechanisms, as well as design time profiling and runtime profiling, towards the production of advanced analytics and software runtime profiling.
- A marketplace including an applications' and virtual network functions' repository and a set of mechanisms for supporting the diverse 5G stakeholders.

AT A GLANCE

Programme:	H2020-ICT-2016-2
Duration:	30 months
Starting Date:	1 June 2017
Total Cost:	€8,378,945.36
EC Funding:	€6,664,458.75

Figure 19: MATILDA Flyer, 1st version, p.2



KEY TARGETS

- High performance and reliability:**
 - Optimally deploy and manage 5G-ready applications over application-aware network slices through the definition of open APIs for interaction among service providers and telecommunication infrastructure providers.
 - Dynamically create and manage application-aware network slices by the telecommunication infrastructure providers, supporting the 5G-ready application needs.
- New business opportunities and business models:**
 - Enable vertical industries to take advantage of 5G technologies through the provision of a development kit for 5G-ready applications and a 5G-ready applications orchestrator.
 - Support separation of concerns among vertical applications and network services orchestration, enabling the various stakeholders to exploit the MATILDA framework without any prerequisite.
- Shorten time to market:**
 - Tackle the overall lifecycle of the design, development and orchestration of 5G-ready applications and 5G network service over programmable infrastructure.





A HOLISTIC, INNOVATIVE FRAMEWORK FOR THE DESIGN, DEVELOPMENT AND ORCHESTRATION OF 5G-READY APPLICATIONS AND NETWORK SERVICES OVER SLICED PROGRAMMABLE INFRASTRUCTURE

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Figure 20: MATILDA Flyer, 2nd version, p.1

MAIN VERTICAL DEMOS

The potential for industrial diversification and the application in different domains, which implies increased business prospects, is highlighted by different demonstrators that will be executed and validated. These include:

- HIGH RESOLUTION MEDIA ON DEMAND & BANKING ON THE CLOUD
- DISTRIBUTED SYSTEM TESTING
- 5G EMERGENCY INFRASTRUCTURE
- INDUSTRY 4.0 SMART FACTORY
- SMART CITY INTELLIGENT LIGHTING SYSTEM

These vertical applications will be mapped over three different test beds:

- The University of Bristol 5GUK test bed, integrating an extensive Smart City environment of LTE radio, WiFi and mmWave devices, interconnected by fibre backhaul, and providing OpenStack on High Performance Computing nodes in Bristol, UK;
- The CNIT-S3ITI test bed in Genoa, Italy, based on WiFi and LTE radio devices, emulated Enhanced Packet Core, a MEC platform (OpenVolcano) and a cloud infrastructure stemming from a FIWARE Lab node, in a controlled laboratory environment;
- The Orange Romania Smart City test bed in Alba Iulia, Romania, integrating LTE/5G Lighting Sensors, radio access and VNFs hosted in the Orange Regional Datacenter, and a Cloud middleware IoT platform.

GOALS

MATILDA aims to devise and realize a radical shift in 5G-ready vertical applications, intrinsically bridging cloud-native applications and network service domains. In a stronger integration of cloud and Mobile Edge Computing (MEC) environments, while recognising and conforming to the ongoing developments, MATILDA will provide clear interfaces toward the multi-site management of cloud/edge computing and Internet of Things (IoT) resources. It will support:

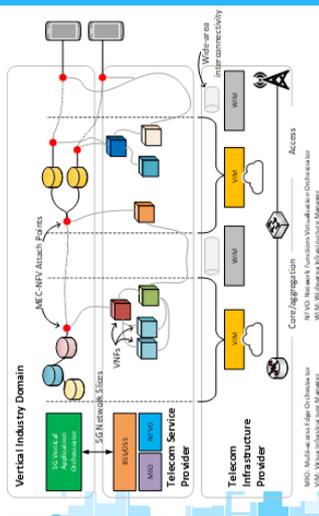
- The creation and maintenance of 5G-ready applications through the selection of their service components and the generation of their own Forwarding Graphs;
- The lifecycle management of the required network slices;
- The interaction with the multi-site Network Functions Virtualisation Orchestrator (NFVO) residing in the Network Providers' domain.
- Network- and application-oriented analytics and profiling mechanisms;
- A 5G-ready Application Orchestrator layer based on component-proxying (performing dynamic service discovery, load balancing, TLS termination, circuit breaking, health checking, L7 traffic shaping, publication of metrics, etc.) to materialize a service mesh (SM).
- Tools for constantly monitoring, analysing and optimising the SM's installed components and the allocated infrastructure, in order to guarantee the optimal usage of resources and enforce that network slice specifications are met.

The concept of **slice intention** will allow the application-level orchestrator to request, negotiate, deploy, maintain and discontinue the proper application-aware slice instantiation, tailored to the specific application's needs, by also providing a set of mechanisms for runtime adaptation of the application components and/or network functions, based on policies defined on behalf of the services' provider.

The MATILDA architecture is divided into three distinct layers; namely:

- Development Environment and Marketplace
- 5G-ready Application Orchestrator
- Programmable 5G Infrastructure Slicing and Management

ARCHITECTURAL FRAMEWORK



AT A GLANCE

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KEY IMPACT ON STAKEHOLDERS

- Application Developers:** flexibility in the design and development of 5G-ready applications by easy-to-access tools.
- (Vertical) Application Service Providers:** policies-based highly configurable network agnostic slice requests.
- Telco providers:** full lifecycle management of application-aware network slices over multi-site programmable infrastructure.
- VNF/PNF developers:** direct VNF products' distribution channel towards telco providers through the MATILDA marketplace.

Figure 21: MATILDA Flyer, 2nd version, p.2

8 Online Publishing and Press Releases

Another communication target of MATILDA is to raise awareness regarding its objectives through electronic newspapers, online magazines and similar items.

Local press is an important and useful communication channel used to increase the project visibility among the wide public; press releases often comprise both printed matter and online publishing versions.

All partners are expected to contribute to communicate the project concepts, scope, objectives and expected outcomes in local press in their countries. Among such actions, it is worth mentioning in particular:

- COSMOTE:
 - Press Release on 19 October 2017, regarding the company's 5G activities, including participation in MATILDA 5G-PPP project. This Press Release appeared in a wide number of printed and electronic mass media.
URL: https://www.cosmote.gr/fixed/en/corporate/details/-/asset_publisher/gLfNzjIgw7PO/content/o-omilos-ote-sto-dromo-gia-to-5g
 - The MATILDA project reported in the annual Corporate Sustainability Reports of both OTE Group and Deutsche Telecom for year 2017.
URL: https://www.cosmote.gr/otegroupsustainability2017/downloads/report2017_eng.pdf (p. 55-56)
URL: <https://www.cr-report.telekom.com/site18/national-companies#greece-ote-cosmote,atn-7413-7414,atn-7413-7417>
- CNIT:
 - MATILDA project article published on the prestigious "PLATINUM" magazine included with "IISole24Ore", the most authoritative and well-known Italian financial newspaper (see Figure 22). The magazine is available online, both in Italian and English language; the paper copy in Italian language has been issued in March 2018.
URL: www.platinum-online.com
URL: <http://www.platinum-online.com/marzo-2018-anna-sirica/>
URL: <http://v.calameo.com/?bkcode=0032723367cd16b3efa23&mode=full> (p. 87)

5G, poised for revolution

The application development tools for the new generation of mobile network are being finalised

By 2020, the 5G, i.e. the fifth generation of mobile network, is expected to come on stream with very innovative features compared to the current 4G: significantly shorter response time, very high transmission speed, more streamlined service development.

While enterprises are designing the new tools, someone is dealing with ‘upstream’ research: the MATILDA project, coordinated by Genoa’s CNIT, with 17 partners from 9 European countries and an € 8.4 million budget. “Our goal is to design and roll out software mechanisms for the develop-



THE PARTICIPANTS IN THE PLENARY MEETING OF THE MATILDA PROJECT (ATHENS, FEBRUARY 2018)

ment of vertical applications serving specific sectors — such as Industry 4.0, emergency services, smart cities, vehicular mobile networks — creating environments where different players can define the features and required elements in a simple manner, as if a catalogue we-

re available”, explained the Head of the Project, Professor Franco Davoli of CNIT. In addition to this, MATILDA will deploy an architecture to ensure the effective use of network function virtualisation: on the upper layer of the physical infrastructure, each operator will be able to

easily define the virtualised network that best meets the requirements of a specific application. “The network may also be programmable depending on the applications. It is a new concept for this sector, but 5G will bring about a revolution virtually across the board.” 



Figure 22: *IlSole24Ore* - Platinum 5G article

It is expected that during the next project phases, which will focus more on implementation activities and demonstrators, the production of communication contents more appealing to the general public will increase. Nevertheless, considering the KPIs defined in the communication roadmap for the online publishing (see Table 9), MATILDA appears to be on track with the expected targeted results.

Table 9: Online publications’ KPIs

Communication means	KPI	Target range (throughout project lifetime)
Online publishing (e.g., online magazines, newspapers, blogs, etc.)	Number of online publications	≥ 20
	Average number of views per publication	≥ 500

9 Newsletters

Newsletters are very useful means to present in a synthetic way the various activities addressed by MATILDA, detailing the project developments, the deliverables' findings and the outcomes reached during the project progress, providing also some hints coming from the project's meetings and the collaboration among partners.

MATILDA's periodic newsletters will be issued according to the communication roadmap defined in D7.1 and reported in Table 9. Such a schedule has been defined in order to provide news, articles and information about the project progresses and results, and any other relevant material up-to-date at the publication time.

The first issue of the MATILDA Newsletter has been released according to the schedule and published on the MATILDA public website. As of the time of writing it received 96 downloads.

Table 10: MATILDA's Newsletter

Newsletter Issue	Publication Date
MATILDA Newsletter #1	Month 10 (March 2018)
MATILDA Newsletter #2	Month 18 (November 2018)
MATILDA Newsletter #3	Month 22 (March 2019)
MATILDA Newsletter #4	Month 30 (November 2019)



Figure 23: MATILDA's Newsletter cover and page layout



10 Conclusions

This deliverable summarizes the communication activities carried out by the MATILDA Consortium during the first reporting period, i.e. from 1 June 2017 to 31 August 2018.

The main points taken into account in the MATILDA communication roadmap have been highlighted, specifically in the document a section has been dedicated to discuss each of the following communication item/channel: Project Logo, Project Website, Social Media, Project Poster, Project Flyer, Online Publishing and Press Releases, and Newsletters. Where applicable, the achieved KPIs in relation to the expected target have been indicated.

The communication to the wide public of the project achievements is a continuing process. All the relevant events and actions will be included in the dedicated section of the project website, and they will be reported and commented in the next deliverable on the communication activities.