



Programmable edge-to-cloud virtualization fabric for the 5G Media industry

D1.1 - Quality Plan

Work Package: WP1 - Management and Coordination

Lead partner: ENG

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Quality Control

Role	Date	Who	Approved/Comment
Technical Coordinator	8/1/2018	Stamatia Rizou	Approved: Minor changes on the scope of the document to make clear that it intends to provide a reference for managerial, communication and quality assurance issues. In this line, Section 2 could be shortened to minimize the material duplicated w.r.t. DoA.
WP7 Leader	8/1/2018	Jose Gonzalez (IINV)	Approved with minor changes

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The 5G-MEDIA Consortium is the following:

Participant number	Participant organisation name	Short name	Country
01	ENGINEERING – INGEGNERIA INFORMATICA SPA	ENG	Italy
02	IBM ISRAEL - SCIENCE AND TECHNOLOGY LTD	IBM	Israel
03	SINGULARLOGIC ANONYMI ETAIREIA PLIROFORIAKON SYSTIMATON KAI EFARMOGON PLIROFORIKIS	SiLO	Greece
04	HELLENIC TELECOMMUNICATIONS ORGANIZATION S.A. - OTE AE (ORGANISMOS TILEPIKOINONION TIS ELLADOS OTE AE)	OTE	Greece
05	CORPORACION DE RADIO Y TELEVISION ESPANOLA SA	RTVE	Spain
06	UNIVERSITY COLLEGE LONDON	UCL	United Kingdom
07	TELEFONICA INVESTIGACION Y DESARROLLO SA	TID	Spain
08	UNIVERSIDAD POLITECNICA DE MADRID	UPM	Spain
09	INSTITUT FUER RUNDFUNKTECHNIK GMBH	IRT	Germany
10	NEXTWORKS	NXW	Italy
11	ETHNIKO KENTRO EREVNAS KAI TECHNOLOGIKIS ANAPTYXIS	CERTH	Greece
12	NETAS TELEKOMUNIKASYON ANONIM SIRKETI	NET	Turkey
13	INTERINNOV SAS	IINV	France
14	BITTUBES GMBH	BIT	Germany

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Definitions and acronyms

5G-PPP	5G Infrastructure Public Private Partnership
CA	Consortium Agreement
DoA	Description of Action
EC	European Commission
FS	Financial Statement
GA	Grant Agreement
KPI	Key Performance Indicator
PM	Person month
WP	Work Package
WPL	Work Package Leader

Executive summary

The D1.1 – Quality Plan provides an quick reference for the project consortium about the most relevant managerial aspects and procedures to be followed in order to ensure a high quality progress of the work in the project lifetime. To keep the document self-contained, we provide a compact overview on the project objectives and work plan. In particular: a mapping between project objectives and responsible Work Packages is defined in Table 1; internal reviewers responsible for each deliverable is provided in Table 2; planned effort breakdown per partner per task is provided in Figure 4; main contact persons for the management team and task leaders are provided respectively in Table 3 and Table 4. Moreover, reporting procedures are defined taking into consideration both the official Project Periodic Report as well as the Internal Activity Report to be produced quarterly. In addition, the deliverable submission procedure is explained with the aim to release them on time with a reasonable timeframe allocated for the internal review process to be held by the appropriate level identified in the management structure. Finally, a summary of the main communication means is presented, which include meetings and the related ground rules, mailing lists and the 5G-MEDIA Project Repository as a project collaborative space composed by a Document Management System and a Wiki space.

1. Introduction

1.1. Purpose of the document

D1.1 – Quality Plan is produced within the WP1 – Management and Coordination. This document provides a quick overview of the project objectives and the most relevant managerial aspects to be followed, describing the proper implementation of the general mechanisms of work and setting the rules and responsibilities of the 5G-MEDIA consortium. The objective is to ensure a high quality progress of the work in the project lifetime. This includes the production of the deliverables and other project results, the mechanisms for their submission and internal review process, and which are the communication means among partners (i.e. meetings, mailing lists, project collaborative space).

The document will serve to the team leaders within each organisation, researchers and administrative responsible to have at any moment a clear picture on the internal procedures (e.g., main contact persons from each partner, communication and quality assurance procedures) to ensure the delivery of high quality results.

This document could suffer modifications through the lifecycle of 5G-MEDIA project extending the information given here, or providing changes in the project procedures. Each time the document is updated, all the project partners will be informed of the publication of the new version and the changes made with respect to the previous version.

1.2. Structure of the document

This document is organised as follows: section 2 provides an overview of the 5G-MEDIA project summarising the project objectives, Key Performance Indicators (KPIs), the work plan (including how effort of each partner is allocated on work packages and tasks); section 3 summarises the consortium composition and the management structure; section 4 specifies the reporting procedure both technical and financial; section 5 defines the procedures to be followed for the deliverable submission; finally, section 6 summarises the main communication means to be used within the project consortium.

2. Project Summary

2.1. Introduction

The work to be carried out in 5G-MEDIA has to follow the description of action, project schedule and budget as laid down in the 5G-MEDIA Grant Agreement [5G-MEDIA-GA] of the project, concretely as it is laid down in the Annex I (part A). To keep the document self-contained, we present in this Section a compact overview of the project objectives and the work plan.

2.2. Objectives of the project

5G-MEDIA objectives and KPIs are summarised in Table 1. Extended version of the objectives is presented in the Grant Agreement [5G-MEDIA-GA]. Table 1 also shows the mapping

between each objective (and related set of KPIs) and the related Work Package(s) responsible for achieving the objectives.

Table 1 - Objectives, KPIs and related Work Packages

	Obj. No.	Objective	WP in charge
Technical innovation	1	<p>Support the full application lifecycle management (ALM) of development, testing, deployment and operation, hiding the complexity of the network management and orchestration from developers.</p> <p>KPIs:</p> <ul style="list-style-type: none"> 5G-MEDIA SDK will support microservice-based application development for both hypervisor-based and containerized approaches, specifically supporting at least Docker, unikernel, and LXC. 5G-MEDIA platform will integrate innovative and open source tools related to serverless computing (e.g. OpenWhisk), to reduce development time in the order of 5 minutes. Re-use and/or extend at least 4 major components or platforms from at least 3 5G-PPP phase 1 projects (e.g. SDK toolbox, Repository, MANO framework, monitoring system, etc.). Integrate at least 3 different NFVIs/VIMs to 5G-MEDIA platform, according to partners' business interests (e.g. OpenStack, VMware, Kubernetes, etc.). 	WP2, WP3, WP5
	2	<p>Develop new VNFs and media-related functions and extend existing ones to support media oriented use case scenarios.</p> <p>KPIs:</p> <ul style="list-style-type: none"> Reuse and/or extend at least 3 virtual network functions already available as open source. Develop at least 5 open source VNF implementations. Develop or extend at least 6 media components related to 5G-MEDIA use case requirements. 	WP2, WP4
	3	<p>Support and move beyond edge computing paradigm via dynamically defined and orchestrated VNF Forwarding Graphs.</p> <p>KPIs:</p> <ul style="list-style-type: none"> Path prolongation between automatic VNFFG and optimal forwarding path will not exceed 15%. The platform will take into consideration at least 5 supported networking parameters and performance metrics for VNFFG selection. 	WP3
Business Innovation	4	<p>Enable a directly exploitable solution through the orchestration and placement of media services over heterogeneous nodes belonging to different administrative domains or infrastructure owners/operators.</p> <p>KPIs:</p> <ul style="list-style-type: none"> Full traceability of the microservice components throughout their lifecycle even when placed/migrated to nodes administered by different actors. Automatic negotiation and monitoring of specific SLA between different actors. 	WP2, WP3, WP7

		<ul style="list-style-type: none"> New business models, based on StraaS innovative concept in the edge-to-cloud fabric. 	
	5	<p>Evaluate and demonstrate the 5G-MEDIA platform through extensive test-bed experimentation and large-scale trials conducted by the 5G-MEDIA consortium, and developer communities.</p> <p>KPIs:</p> <ul style="list-style-type: none"> The 5G-MEDIA platform will be demonstrated to at least 3 large events such as international workshops, conferences and industry fairs. At least 3 open source communities, 3 Celtic-Plus Eureka projects to participate on the 5G-MEDIA platform validation. 	WP6, WP7
Impact	6	<p>Actively promote widespread adoption, impact creation & standardization.</p> <p>KPIs:</p> <ul style="list-style-type: none"> Contribution of at least 3 new drafts in IETF/IRTF Participation in at least 3 ETSI and ISO/IEC working groups. Contribution to at least 2 open source projects and initiatives. Active participation in at least 5 different 5G-PPP existing Working Groups. Contribute to at least 2 position and white papers issued by the 5G-PPP. 	WP7
	7	<p>Promote the commercial exploitation of the results.</p> <p>KPIs:</p> <ul style="list-style-type: none"> Commercial exploitation through participation and demonstration to at least 5 major European or International events. Promote 5G-MEDIA offerings to at least 50 B2B customers of the consortium partners. 	WP7

2.3. Work Plan summary

The goals and activities 5G-MEDIA is committed to overcome are structured in seven Work Packages. The detailed description of each Work Package's scope can be found in the 5G-MEDIA Grant Agreement [5G-MEDIA-GA] and is reported here:

- **WP1 – Management and Coordination:** provide the internal project management and the overall coordination of activities, as well as financial planning and control. In addition, it shall ensure the accomplishment of the project objectives, paying attention to the innovation management and representing the contact point with the European Commission.
- **WP2 – Architecture, Analysis and Tools:** the main objective of this work package is to place work into both technical and business perspectives that will drive the activities in WP3-WP6. To achieve this target, this WP will design the reference architecture of the platform by facilitating a unified conceptual approach to the technical activities of the project in relation to internal and external stakeholders. The work will focus on the analysis and refinement of the Use Cases where 5G-MEDIA capabilities will be validated, extracting main requirements of the different players involved; the specification of the overall architecture for the 5G-MEDIA Platform; and the setup of

the tools that will support the internal operations of the project, such as code repository, bug tracking and an automated testing.

- **WP3 – Operations and Configuration Framework:** implement the Service Virtualization Platform that will provide the management and orchestration capabilities for the operation services to be developed, instantiated and demonstrated in 5G-MEDIA project. The efforts will be oriented to materialise the MANO framework and NFVI interoperability, by leveraging on the achievements of running projects, especially those in 5G-PPP phase 1, while ensuring the integration of the serverless computing framework. The platform will be enhanced with a flexible configuration and access manager to interface external systems, as well as a proper mechanism to control the Quality of Service perceived by the end users.
- **WP4 – 5G-MEDIA Open Repository of Network Apps:** develop and make accessible the set of Network Apps that will be used to validate the various environments proposed in the Use Cases. The functionalities shall cover generic purpose features as well as media oriented applications. These Net Apps will be accessible by means of an open repository integrated with the 5G-MEDIA DevOps Platform.
- **WP5 – 5G-MEDIA APIs and SDK Tools:** provide application/service developers with an open environment for creation of new Network Apps. The Service Development Kit (SDK) and APIs will provide third party developers to support the new programming model and provide a set of well-integrated open source, proofing and packaging tools, libraries, repositories and catalogues assisting the service development, testing and validation process.
- **WP6 – 5G-MEDIA Use Cases, Scenarios and Validation:** validate the capabilities enabled by the 5G-MEDIA DevOps Platform in three key scenarios selected for its innovation impact: Immersive Media Environments and VR, Mobile Contribution, Remote and Smart Production and High Demanding UHD over Open CDNs.
- **WP7 – Impact, Dissemination and Exploitation:** promotion, standardisation, technical dissemination, exploitation and impact assessment activities for the 5G-MEDIA project as well as in the broader 5G context by liaising with other ongoing 5G related initiatives and projects, participating to the 5G standardization work and ensuring establishment of proper communication and information means.

In the following sub section, the Pert chart presents the project structure illustrating the dependencies of the different work packages while the Gantt chart shows the different tasks of the project over time.

2.3.1. 5G-MEDIA Pert chart

The overall dependencies between the technical work packages are depicted in the Figure 1.

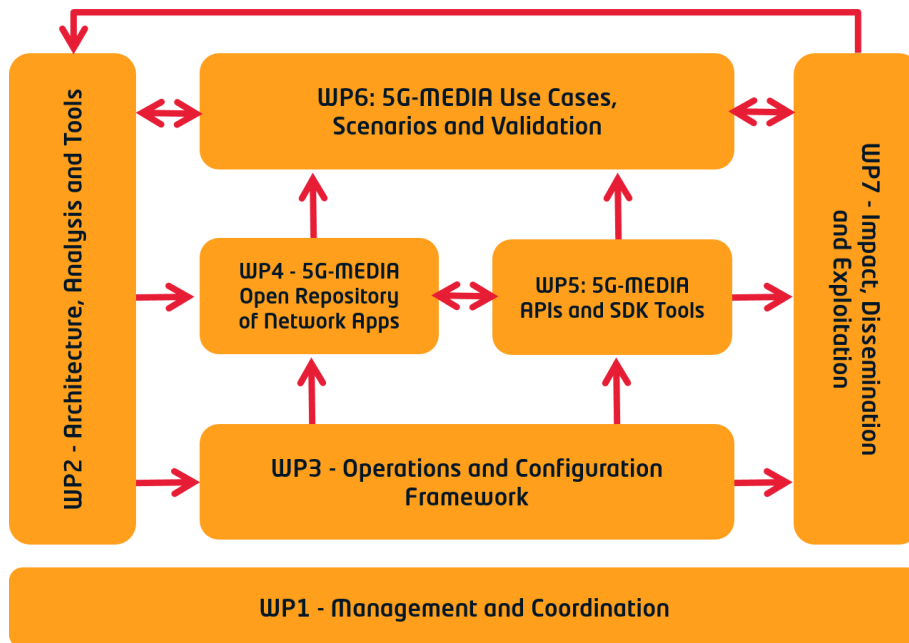


Figure 1 - 5G-MEDIA Pert Chart



Work Packages/ Tasks	2017							2018												2019										
	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov
WP5 5G-MEDIA APIs and SDK Tools																														
T5.1 Programming Tools																														
T5.2 API Development by using Serverless Computing Framework																														
T5.3 Packaging and Integration Tools																														
WP6 5G-MEDIA Use Cases, Scenarios and Validation																														
T6.1 Immersive Media Environments and VR Pilot																														
T6.2 Mobile Contribution, Remote and Smart Production Pilot																														
T6.3 High Demanding UHD over Open CDNs Pilot																														
WP7 Impact, Dissemination and Exploitation																														
T7.1 Sustainable Business Models																														
T7.2 Dissemination, Communication and Community Building																														
T7.3 Collaboration with 5G PPP Association and Running Projects																														
T7.4 Cooperation with Open Source and Standardization Communities																														

Figure 2 - 5G-MEDIA Gantt Chart

2.3.3. Deliverables, roles and lead beneficiaries

The list of deliverables for the 30 months of the project is shown in Table 2. Each of the deliverables must be finished and submitted to the EC at the latest by the last day of the month specified in the “Due Date” columns. In order to have the highest possible quality of project deliverables, the contributions to the deliverables have to be (always that it is possible) original, not extracted or copied from other sources. Nevertheless, information taken from other sources could be valid and valuable for some deliverables, and in these cases, it is necessary to explicitly reference the source from which the information has been taken. If any kind of delay is detected, this has to be reported both to the Project Coordinator and the Technical Manager, so the necessary corrective actions are taken and the EC officer is kept informed

As shown in Table 2, each deliverable is associated to one or more tasks of the project, has a Lead Beneficiary partner and two internal reviewers who will be responsible for the quality control of the deliverable.

As responsible of a deliverable, the Lead Beneficiary role goes further than being only the coordinator of the deliverable and gathering the inputs of other participants in the task. In this sense, the Lead Beneficiary is supposed to be very active in contributing to the deliverable and in giving it the necessary coherence and final quality. WP leaders are also supposed to have a leading role in the elaboration of each deliverable, as each WP leader is the first responsible of the quality of the deliverables generated within each WP.

Table 2 - Deliverables and reviewers

No.	Deliverable Name	WP	Task(s)	Lead Beneficiary	Due Date (in months)	Reviewer 1	Reviewer 2
D1.1	Quality Plan	WP1	T1.1	ENG	M6	IINV	SiLO
D1.2	Data Management Plan	WP1	T1.2	OTE	M6	UPM	IINV
D1.3	Project Periodic Report (intermediate)	WP1	T1.1	ENG	M13	SiLO	IINV
D1.4	Project Periodic Report (final)	WP1	T1.1	ENG	M30	SiLO	IINV
D2.1	APIs and Tools for Operation Support	WP2	T2.3	ENG	M6	SiLO	NET
D2.2	5G-MEDIA Requirements and Use Case Refinement	WP2	T2.1	UCL	M11	OTE	TID
D2.3	5G-MEDIA Platform Architecture	WP2	T2.2	SiLO	M15	NXW	ENG
D2.4	Final Report on Architecture, Requirements and Specification	WP2	T2.1, T2.2	SiLO	M30	UPM	IBM
D3.1	Initial design of the 5G-MEDIA Operations and Configuration Platform	WP3	T3.1	SiLO	M9	ENG	NXW
D3.2	Specification of the 5G-MEDIA Serverless Computing Framework	WP3	T3.2	IBM	M15	UCL	ENG
D3.3	Specification of the 5G-MEDIA QoS Control and Management Tools	WP3	T3.3	UCL	M15	SiLO	IBM
D3.4	5G-MEDIA Operations and Configuration Platform	WP3	T3.1, T3.2, T3.3	UCL	M29	NXW	UPM
D4.1	5G-MEDIA Catalogue APIs and Network Apps	WP4	T4.1, T4.2, T4.3	UPM	M15	NET	BIT
D4.2	5G-MEDIA Catalogue Portal and Network Apps	WP4	T4.1, T4.2, T4.3	UPM	M29	IRT	NET
D5.1	5G-MEDIA Programming Tools	WP5	T5.1	NET	M15	IBM	ENG
D5.2	5G-MEDIA Rest API, Tutorials and Code Samples	WP5	T5.2	NET	M29	ENG	UPM
D5.3	5G-MEDIA Web API, Tutorials and Code Samples	WP5	T5.2	NET	M29	ENG	UPM
D5.4	Packaging and Integration Tools evaluation and setup	WP5	T5.4	ENG	M29	SiLO	IBM
D6.1	5G-MEDIA Use Case Scenarios and Testbed	WP6	T6.1, T6.2, T6.3	OTE	M15	CERTH	IRT

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No.	Deliverable Name	WP	Task(s)	Lead Beneficiary	Due Date (in months)	Reviewer 1	Reviewer 2
D6.2	5G-MEDIA Immersive Media Pilot	WP6	T6.1	CERTH	M30	IRT	BIT
D6.3	5G-MEDIA Mobile Contribution, Remote and Smart Production Pilot	WP6	T6.2	IRT	M30	UCL	RTVE
D6.4	5G-MEDIA High Demanding UHD over Open CDNs Pilot	WP6	T6.3	NXW	M30	OTE	ENG
D7.1	5G-MEDIA Website	WP7	T7.2	ENG	M2	IINV	-
D7.2	Dissemination, Communication and community building plan	WP7	T7.2, T7.3, T7.4	IINV	M6	SILO	NXW
D7.3	5G-MEDIA Impact and Exploitation Plan	WP7	T7.1	ENG	M9	NXW	SILO
D7.4	Report on dissemination, communication and community building activities and updated plan (version 1)	WP7	T7.2, T7.3, T7.4	IINV	M15	UPM	NXW
D7.5	5G-MEDIA Report on Impact and Exploitation (version 1)	WP7	T7.1	ENG	M15	IINV	TID
D7.6	Report on dissemination, communication and community building activities and updated plan (version 2)	WP7	T7.2, T7.3, T7.4	IINV	M30	UPM	NXW
D7.7	5G-MEDIA Report on Impact and Exploitation (version 2)	WP7	T7.1	ENG	M30	IINV	TID

2.3.4. Effort in person months (per WP)

Figure 3 shows the summary staff effort per WP per partner as also reported in 5G-MEDIA Grant Agreement [5G-MEDIA-GA]. Cells in orange identify the WP Leaders.

Partner		WP1	WP2	WP3	WP4	WP5	WP6	WP7	Total PMs /participant
P1	ENG	34	11	7	19	18	0	34	123
P2	IBM	0	9	39	0	12	0	9	69
P3	SILO	0	31	31	17	12	15	14	120
P4	COSMOTE	9	2	6	4	0	43	12	76
P5	RTVE	0	4	0	0	0	26	9	39
P6	UCL	0	11	29	6	0	16	7	69
P7	TID	0	4	0	0	0	17	16	37
P8	UPM	0	3	10	37	6	32	4	92
P9	IRT	0	3	5	18	0	20	2	48
P10	NXW	0	9	24	13	0	20	4	70
P11	CERTH	0	6	0	14	11	24	1	56
P12	NETAS	0	7	3	0	83	0	4	97
P13	IINV	0	0	0	0	0	0	35	35
P13	BIT	0	4	5	21	0	12	8	50
Total		43	104	159	149	142	225	159	981

Figure 3 - Summary of staff effort

2.3.5. Effort in person months (breakdown per Task)

The consortium partners have also agreed on how the person months in each WP are distributed among the tasks. Figure 4 shows the breakdown effort planned to be spent in each task. Cells in orange identify the lead partner of the task as well as WP Leaders.

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			P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14
			ENG	IBM	SILO	OTE	RTVE	UCL	TID	UPM	IRT	NXW	CERTH	NET	IINV	BIT
	Lead	Effort	123	69	120	76	39	69	37	92	48	70	56	97	35	50
WP1: Management and Coordination	ENG	43	34	0	0	9	0	0	0	0	0	0	0	0	0	0
T1.1: Project Management and Administration	ENG	30	30													
T1.2: Project IPR & Risk Management	OTE	13	4			9										
WP2: Architecture, Analysis and Tools	SILO	104	11	9	31	2	4	11	4	3	3	9	6	7	0	4
T2.1: Use Case Assessment and Requirements Specification	UCL	39	2	2	6	2	4	6	2	2	2	3	4	2		2
T2.2: 5G-MEDIA Platform Architecture	SILO	48	2	5	20			5	2	1	1	6	2	2		2
T2.3: 5G-MEDIA Operation Support Tools	ENG	17	7	2	5									3		
WP3: Operations and Configuration Framework	UCL	159	7	39	31	6	0	29	0	10	5	24	0	3	0	5
T3.1: MANO Framework and NFVI Interoperability	SILO	66	2	10	18	3		12			3	15		3		
T3.2: Integration of Serverless Computing Framework	IBM	37		24	3			5								5
T3.3: Quality of Service Control Management	UCL	56	5	5	10	3		12		10	2	9				
WP4: 5G-MEDIA Open Repository of Network Apps	UPM	149	19	0	17	4	0	6	0	37	18	13	14	0	0	21
T4.1: Catalogue Setup and Operation	UPM	56	15		6					22	2	3	2			6
T4.2: Generic Network Apps and Functions	NXW	31	4		7	4		3				10				3
T4.3: Media Network Apps and Tools	IRT	62			4			3		15	16		12			12
WP5: 5G-MEDIA APIs and SDK Tools	NET	142	18	12	12	0	0	0	0	6	0	0	11	83	0	0
T5.1: Programming Tools	NET	54	2		3					2			7	40		
T5.2: API Development by using Serverless Computing Framework	NET	51		12	4									35		
T5.3: Packaging and Integration Tools	ENG	37	16		5					4			4	8		
WP6: 5G-MEDIA Use Cases, Scenarios and Validation	OTE	225	0	0	15	43	26	16	17	32	20	20	24	0	0	12
T6.1: Immersive Media Environments and VR Pilot	CERTH	68			5	11		3	10	15			24			
T6.2: Mobile Contribution, Remote and Smart Production Pilot	IRT	71			5	16	12	3		7	16					12
T6.3: High Demanding UHD over Open CDNs Pilot	NXW	86			5	16	14	10	7	10	4	20				
WP7: Impact, Dissemination and Exploitation	IINV	159	34	9	14	12	9	7	16	4	2	4	1	4	35	8
T7.1: Sustainable Business Models	ENG	46	16	3	4	5	5		5					2	3	3
T7.2: Dissemination, Communication and Community Building	IINV	69	12	3	3	3	4	5	3	4	2	2	1	2	20	5
T7.3: Collaboration with 5G PPP Working Groups and Projects	IINV	24	4		5	2		1	3			1			8	
T7.4: Cooperation with Open Source and Standardization Communities	TID	20	2	3	2	2		1	5			1			4	

Figure 4 - Effort in person month (breakdown per Task)

3. Consortium composition, contacts and management structure

3.1. Consortium and participant contacts

Official contact information of each of the Project Participants is included in the 5G-MEDIA Grant Agreement [5G-MEDIA-GA]. The full list of project participants, along with subscription to mailing lists is maintained as a living document in the 5G-MEDIA Project Repository as a document restricted to the consortium. Partners are responsible to inform about any modification of their representatives both to project coordinator and to Project Management Board / Executive Board or WP leader, who will be responsible for and informing the rest of members (if necessary).

3.2. Management structure

The project management approach considered for this project is based on management plans and techniques which were successfully used by the 5G-MEDIA partners in previous projects. The primary aim of this management structure is to be capable of responding to the needs of Innovation Action without being intrusive or costly. The building-in of flexibility was one essential aspect while defining this structure. The management structure is shown in Figure 5.

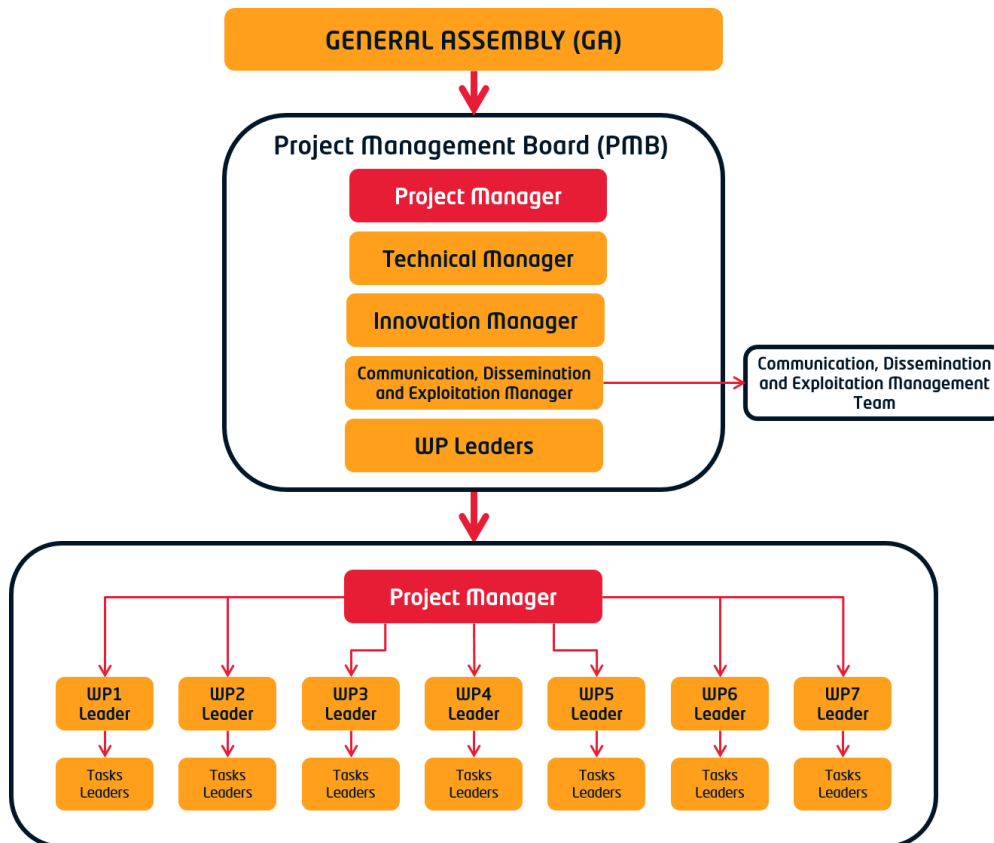


Figure 5 - 5G-MEDIA Management Structure

Description and dues of these entities are fully described in the 5G-MEDIA Grant Agreement [5G-MEDIA-GA] and briefly reported here:

- The **General Assembly**, chaired by the Project Coordinator and comprising one representative of each partner in the 5G-MEDIA consortium, is the only body able to take decisions regarding contractual matters, such as resource and budget re-allocations. The General Assembly (GA) is conceived as the operational body of the project and will decide on matters related to the overall work plan. It will discuss and make decisions on the basis of reports from the different Work Packages, and will indicate and guide actions that are deemed necessary for securing the uninterrupted progress of the project as a whole. The overall duties of the GA include: following up the project; releasing project results; managing potential problems and taking all major decisions. In case that a major modification of the overall project will be required, the decision for such a change will be made after consultation with all the participating members.
- A **Project Management Board (PMB)** formed by the Project Coordinator, the Technical Manager, the Innovation Manager, the Communication, Dissemination and Exploitation Manager and the WP Leaders. The Project Management Board (PMB) will meet two times per year during the project, co-located with regular progress meetings, to define the strategy, to follow up the activities carried out in the project and to connect the project to General Assembly. It will approve the project reports on the work performed and planning for the next period. Also, it will deal with legal, financial and secretarial matters and also establish the agenda of the meetings and workshops. The main roles encompassed in the PMB are:
 - a) **Technical Manager:** supervising the overall technical and scientific progress and being responsible for monitoring the technical achievement of the 5G-MEDIA, ensuring the accomplishment of the technical objectives.
 - b) **Innovation Manager:** responsible of the further development of the innovation aspects of the project so as to ensure the successful market exploitation of the scientific results. This role requires both technical and market expertise. The Innovation Manager will supervise the Innovation Management Team, composed of the industrial members of the consortium. Innovation management will start from the very beginning of the project and will include a continuous process consisting of closely interrelated and iterative activities taking place in parallel with the other key steps of the project in order to ensure how innovation aspects will be further developed during the project life.
 - c) **Communication, Dissemination and Exploitation Manager:** responsible to raise public awareness on the project, to ensure wide dissemination of the results and share best practices. The Communication, Dissemination and Exploitation Manager will be assisted by the Communication, Dissemination and Exploitation Management Team, composed of members from partners involved in communication duties, and especially with the 5G Infrastructure Public Private Partnership (5G-PPP) representatives to ensure an efficient and consistent approach.
 - d) **WP Leaders:** The WP Leaders will be responsible for developing a detailed WP implementation plan on the basis of the current Work Plan, and for the efficient and effective implementation of it, taking into account the timeliness and quality

of the WP deliverables. So, the WP leaders will control and manage the technical progress achieved on a Work Package level.

PMB members, roles and contacts identified in the 5G-MEDIA Management structure are shown in Table 3.

Table 3 - PMB members, roles and contacts

Role	Main contact [Partner]	Deputy contact [Partner]
Project Coordinator	Francesco Saverio NUCCI [ENG]	Pasquale ANDRIANI [ENG]
Technical Manager	Stamatia Rizou [SiLO]	Stelios PANTELOPOULOS [SiLO]
Innovation Manager	George AGAPIOU [OTE]	-
Communication, Dissemination and Exploitation Manager	Jacques MAGEN [IINV]	Jose GONZALEZ [IINV]
WP1 Leader	Pasquale ANDRIANI [ENG]	-
WP2 Leader	Stamatia RIZOU [SiLO]	-
WP3 Leader	David GRIFFIN [UCL]	Miguel RIO [UCL]
WP4 Leader	Federico ALVAREZ [UPM]	-
WP5 Leader	Ugur ACAR [NET]	-
WP6 Leader	George AGAPIOU [OTE]	-
WP7 Leader	Jose GONZALEZ [IINV]	Jacques MAGEN [IINV]

Additionally, Work Package Leaders will be responsible for coordination of the Work within the individual tasks of their Workgroups. Each Work Package is divided into several tasks. For each task, a leader (and possibly a deputy) is appointed in accordance with the Description of Work, which shall report to the relevant Work Package Leader.

5G-MEDIA Task Leaders are identified in Table 4.

Table 4 - 5G-MEDIA Task Leaders

	Task	Main contact [Partner]	Deputy contact [Partner]
WP1	Task 1.1: Project Management and Administration	Pasquale Andriani [ENG]	-
	Task 1.2: Project IPR & Risk Management	George Agapiou [OTE]	Christina Lessi [OTE]
WP2	Task 2.1: Use Case Assessment and Requirements Specification	David Griffin [UCL]	Miguel Rio [UCL]
	Task 2.2: 5G-MEDIA Platform Architecture	Stamatia Rizou [SiLO]	-
	Task 2.3: 5G-MEDIA Operation Support Tools	Francesco Iadanza [ENG]	-

	Task	Main contact [Partner]	Deputy contact [Partner]
WP3	Task 3.1: MANO Framework and NFVI Interoperability	Panagiotis Athanasoulis [SiLO]	-
	Task 3.2: Integration of Serverless Computing Framework	David Breitgand [IBM]	Avi Weit [IBM]
	Task 3.3: Quality of Service Control Management	David Griffin [UCL]	Miguel Rio [UCL]
WP4	Task 4.1: Catalogue Setup and Operation	Federico Alvarez [UPM]	-
	Task 4.2: Generic Network Apps and Functions	Gino Carrozzo [NXW]	Francesca Moscatelli [NXW]
	Task 4.3: Media Network Apps and Tools	Sebastian Prokesch [IRT]	Gordana Polanec-Kutija [IRT]
WP5	Task 5.1: Programming Tools	Ugur Acar [NET]	Cengiz Gezer [NET]
	Task 5.2: API Development by using Serverless Computing Framework	Ugur Acar [NET]	Cengiz Gezer [NET]
	Task 5.3: Packaging and Integration Tools	Francesco Iadanza [ENG]	-
WP6	Task 6.1: Immersive Media Environments and VR Pilot	Nikolaos Zioulis [CERTH]	Dimitris ZARPALAS [CERTH]
	Task 6.2: Mobile Contribution, Remote and Smart Production Pilot	Gordana Polanec-Kutija [IRT]	Madeleine Keltsch [IRT]
	Task 6.3: High Demanding UHD over Open CDNs Pilot	Gino Carrozzo [NXW]	Francesca Moscatelli [NXW]
WP7	Task 7.1: Sustainable Business Models	Alessandra Aurelio [ENG]	Francesco Nucci [ENG]
	Task 7.2: Dissemination, Communication and Community Building	Giulia Pastor [IINV]	Jose Gonzalez [IINV]
	Task 7.3: Collaboration with 5G PPP Working Groups and Projects	Jacques Magen [IINV]	Jose Gonzalez [IINV]
	Task 7.4: Cooperation with Open Source and Standardization Communities	Rocio Ortiz Peña [TID]	David López Meco [TID]

4. Reporting procedure

The project reporting is the procedure used by the EC to assess and follow up the financed projects. Therefore, it is of utmost importance, as it conditions in a very direct way the good image and good assessment of the project by the EC. It is important to remark that project reporting is a responsibility of the whole Consortium and every partner has to be involved in

it. The Project Coordinator is the responsible for gathering the information and reports from the different partners and consolidating it before sending it to the EC.

There are two types of reporting documents including technical and financial information: **Project Periodic Report** and **Internal Activity Report**. The former ones include those official reports that must be submitted to the EC. The latter ones refer to those internal documents that will be used as control measures to ensure adequate technical and economic progress and to monitoring 5G-MEDIA project. The Internal Activity Reports will also feed official ones.

4.1. Internal Activity Report

Apart from these Project Periodic Reports, Internal Activity Reports have to be produced by consortium partners to the project coordinator on a quarter basis (each three months). Internal Activity Report shall contain Technical Information about WP progress provided by WP leaders, but also all partners will be requested to provide a breakdown of the effort spent in the related quarter per month, per task.

The procedure to be followed is:

- At the end of the quarter period, the Project Coordinator will send the WP leaders an email with instructions and template to be filled in;
- WP leaders are in charge of managing the request for contribution by checking that all partners contributing to the WP have compiled their sections, in particular:
 1. each Partner has to fill in the related section(s) in “Partners’ contribution” for each task in which it is involved, and has to briefly describe activities performed and results achieved during the period, including the effort spent in the period;
 2. each Task leader summarizes activities and achievements of the task in the related task section.
 3. each WP Leader summarizes activities and achievements of the WP in the related WP section; if any, provide Issues/deviations from the plan.
- WP leaders send the related WP contribution to the Project Coordinator; this has to happen 20 days after the closure of the period.
- Finally, the Project Coordinator consolidate the Internal Activity Report and share it with the consortium once finalised.

4.2. Project Periodic Report

During the 5G-MEDIA project, two official Project Periodic Reports must be submitted to the EC by the Project Coordinator, covering the periods P1 (from Month 1 to Month 13) and P2 (from Month 14 to Month 30). The reports shall be submitted to the EC for each reporting period within 60 days after the end of the period in question. The delay in the submission of these reports may cause the postponement of part of the next payment to be received by the partner until the next reporting period. The technical part will be managed through corresponding deliverables D1.3 – Project Periodic Report (intermediate) and D1.4 – Project Periodic Report (final), as per Grant Agreement. The Project Coordinator is in charge to prepare these based on the information provided through Internal Activity Reports.

The financial status of the project and costs incurred during the period must be communicated to the EC by preparing Financial Statements (FS) in order to claim for the payment. Each consortium partner has to upload financial information to the research participant portal based on cumulative information obtained from the Interim Activity Report.

The procedure to be followed is:

- The Project Coordinator will ask the partner to generate its Financial Statement in the Research Participant Portal. It is a formulary in which each partner officially declares the costs incurred for a concrete period.
- Each partner will complete the financial statements with the costs incurred during the period.
- Each partner will submit and digitally sign the Financial Statement. This signature will be done by the Project Financial Signatory appointed.
- The Coordinator will submit the financial report to the EC.

5. Deliverables submission

The different technical objectives set for the project have their correspondence with the work packages and defined tasks. Compliance with these technical objectives is evident by release of the corresponding Deliverables. Each deliverable is assigned to Lead Beneficiary partners who will be responsible of its elaboration in due date. Every Lead Beneficiary is fully responsible for the deliverable's quality and is required to maintain adequate control of the participants' contributions.

The deliverables shall be submitted to the EC in English, by electronic means (in pdf format) or in any other format only if required by EC. The appropriate and updated deliverable template can be found in the 5G-MEDIA Project Repository.

All the deliverables must be finalized and submitted to the EC within the deadlines defined in Annex I of the Contract with the EC.

The process to be followed for the deliverable submission is:

- **30 days before the delivery date at latest** - the Lead Beneficiary will release the draft version of the deliverable (he is encouraged to request contributions to task participants with the supervision of the WP leader) by sending it to the reviewers (identified in Table 2). WP leader, Technical Manager and Project Coordinator must be in CC in these communications.
- **20 days before the delivery due date at latest** - the reviewers will check it and give the needed suggestions to improve the deliverable if necessary, basically sending specific comments to be able to identify additional information needed and always using track changes when a direct editing is needed to better clarify comments. They will send it to the Lead Beneficiary (always keeping WP leader, Technical Director and Project Coordinator in CC).
- **7 days before the delivery due date at latest** - In turn, the Lead Beneficiary will check the quality and consistency of the received reviews and elaborate a consolidated version. The Lead Beneficiary sends the 2nd draft of the deliverable to the WP leader,

Technical Manager and Project Coordinator who will validate this version or ask for further information if necessary. The Project Coordinator or the Technical Manager may want to ask support to the PMB, if necessary and small iteration for revision may happen among Lead Beneficiary and PMB.

- **On the delivery due date at latest** – The Project Coordinator uploads the final version of the Deliverable to the Participant Portal, the 5G-MEDIA Document Management System and, if it is a public document, to the project website.

6. Communication among partners

6.1. Meetings

While General Assembly and Executive Board meetings are regulated according to what it is defined in the Consortium Agreement [5G-MEDIA-CA], this section aims at clarifying other kind of meetings that can be necessary to facilitate the collaboration among consortium partners.

A ground rule of each meeting that has to be taken into account is about action points and decision agreed during the meeting. The action point and decision lists has to be included in minutes of the meetings. These lists will include information about the open issue, the responsible for each solution and the deadline for the open action. In each meeting follow up, the list will be reviewed and updated.

6.1.1. Project Management Board (PMB) meeting

Project Management Board (PMB) meetings are chaired by the Project Coordinator inviting all the PMB members. It is monthly-based and, mainly, through conference call. Face-to-face meetings will be almost co-located with the General Assembly meeting. It is responsibility of the Project Manager to take notes and to make the meeting minutes available through the 5G-MEDIA Project Repository.

6.1.2. Work package meeting

Each Work Package leader may organise conference calls when it is required to allow technical progress and with respect to the deliverable drafting process. These conference calls are organised by the WPL or by the Task Leader. Meeting minutes has to be published through the 5G-MEDIA Project Repository. In addition, the WPL may also organise face-to-face meetings dedicated to the work package. These meetings should only be scheduled when specific WP technical issues must be discussed and/or agreed in order to obtain a significant WP progress. Tasks leaders can also propose conference calls or face-to-face meeting to the WPL.

6.1.3. Other meetings

Each partner is allowed to ask for the necessary meetings for the development of the project with other member(s) of the consortium. When the meeting involves more than one consortium partner the procedure to be followed is the same as for WP meetings and the

responsible for organizing it is also in charge of producing the minutes of the meeting and to make them available through the 5G-MEDIA Project Repository.

6.2. Mailing lists

A set of e-mail distribution lists have been created to facilitate the communication flows within the different bodies of the consortium. The active mailing lists are shown in Table 5.

Table 5 - 5G-MEDIA Mailing Lists

Mailing List	Description
fiveg-media-all@eng.it	Addressed all people working on 5G-MEDIA (except for administrative contacts).
fiveg-media-administrative@eng.it	Addresses administrative contacts for each consortium partner to discuss any administrative topic.
fiveg-media-pmt@eng.it	Address Project Management Board members.
fiveg-media-wp1@eng.it	Addresses WP1 participants.
fiveg-media-wp2@eng.it	Addresses WP2 participants.
fiveg-media-wp3@eng.it	Addresses WP3 participants.
fiveg-media-wp4@eng.it	Addresses WP4 participants.
fiveg-media-wp5@eng.it	Addresses WP5 participants.
fiveg-media-wp6@eng.it	Addresses WP6 participants.
fiveg-media-wp7@eng.it	Addresses WP7 participants.

Subscription of each project member to the specific mailing list is managed and maintained by the Project Coordinator. The updated subscription list is available through the 5G-MEDIA Project Repository. Each consortium partners is responsible to inform the Project Coordinator whether any modification of their representatives is needed and the Project Coordinator will be responsible for keeping the distribution lists updated and informing the rest of members.

6.3. Project collaborative space: the 5G-MEDIA Project Repository

The collaborative space of the 5G-MEDIA project is provided by the Project Coordinator and it is reachable at <https://production.eng.it/> [5G-MEDIA-Pr.Rep.]. This collaborative space is based on a Liferay¹ instance and includes a Document Management System (through an Alfresco² instance) and a Wiki space. The Document Management System is mainly used to store project documents and make it accessible to all consortium partners, while the Wiki

¹ Liferay - <https://www.liferay.com/>

² Alfresco - <https://www.alfresco.com/>

Space is more oriented to collaborative editing giving the user the possibility to also publish direct links to material stored in the Document Management System.

A brief summary of the documentation organization and content of the 5G-MEDIA Project Repository with respect to the Document Management System:

- **EU** folder – it contains Contractual documents, containing the Grant Agreement with EC and its annexes and the Consortium Agreement with its annexes;
- **WP[1-7]** folders – there is one folder for each of the Work Packages of the project. These folders are managed by each of the WP leaders and contains also final deliverables;
- **5G-PPP** folder – it contains any material related to the programme activities (e.g. meeting minutes of Steering Board, Technology Board, etc.);
- **Dissemination Material** folder – it contains all the dissemination material;
- **Partner Logos** folder – it contains all the logos of the 5G-MEDIA partners;
- **PMB** folder – it contains all the material related to the PMB;
- **Physical meeting** folder - it contains all the material related to physical meeting (e.g. presentations, agenda, meeting minutes, etc.);
- **Templates and Logo** folder– it contains the 5G-MEDIA official logo, Deliverable template, Power Point template.

7. References

[5G-MEDIA-CA] 5G-MEDIA Consortium Agreement.

[5G-MEDIA-GA] Grant Agreement-761699-5G-MEDIA, Associated with document Ref. Ares(2017)2286070 - 04/05/2017.

[5G-MEDIA-Pr.Rep.] Project collaborative space. Available at <https://production.eng.it/>