



## 5G experimentation environment for 3<sup>rd</sup> party media services

### D7.3 Technical management handbook - Initial

#### Document Summary Information

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## Glossary of terms and abbreviations used

Abbreviation / Term	Description
CA	Consortium Agreement
CEO	Chief executive officer
CM	Commercialization Manager
DoA	Description of Actions
DoW	Description of Work
D&C	Dissemination & Communication
EAB	External Advisory Board
EM	Ethics Manager
GA	Grant Agreement
GDPR	General Data Protection Regulation
GeA	General Assembly
IM	Innovation & IPR manager
IMT	Impact Maximization Team
PC	Project Coordinator
PMB	Project Management Board
PMO	Project Management Office
QA	Quality Assurance
QRM	Quality assurance & Risk Manager
TM	Technical Manager
WP	Work Package

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## Executive Summary

This document is a practical guideline and handbook of procedures to facilitate the technical management of the project for all partners and participants. It identifies contractual rules and management procedures relevant to the technical management of the project as well as both internal and EC level reporting.

The management structure and procedures (according to the DoA) with relevance for the technical management is presented, as well as procedures to ensure proper monitoring of technical and dissemination progress. This is in alignment with the procedures in the Project Quality Handbook (i.e., D7.5).

Moreover, this deliverable provides procedures and guidance on planning and development of Deliverables and Software. It also provides procedures on projects' Risk management and guidance on mitigation actions in case of delays or significant challenges. Useful advices and management tools are also provided, which will help project participants to report what is required in an agreed format and in due time.

The document is the initial version of the deliverable, and the next (final) version is D7.4, due for M36.

## 1 Introduction

As reported in the executive Summary, this document is a practical guideline and handbook of procedures to facilitate the technical management of the project for all partners and participants. It identifies contractual rules and management procedures relevant to the technical management of the project as well as both internal and EC level reporting.

The technical management is essential for the success of the project. A clear and agreed definition of roles and procedures for governing 5GMediaHUB from a technical point of view becomes really essential.

As the nature of research project, the technical management should be as most agile as possible. For this reason, key people as the technical manager and the work package leaders play a fundamental role in steering the technical activities in order to adapt the activities and outcomes of the project to the societal need and to a continuing changing behaviour.

### 1.1 Mapping 5GMediaHUB Outputs

Purpose of this section is to map 5GMediaHUB's Grant Agreement commitments, both within the formal Deliverable and Task description, against the project's respective outputs and work performed.

Table 1: Adherence to 5GMediaHUB's GA Deliverable & Tasks Descriptions

GA Component Title	GA Component Outline	Respective Document Chapter(s)	Justification
<b>TASKS</b>			
Task T7.2 – Technical Management	Execution of overall technical management of the project including: (a) Monitor the technical progress of the project according to the contractual schedule; (b) Prepare technical project reviews; (c) Monitor the flow of technical information among the different WPs to develop a common understanding and technical coherence, avoiding any deviation that may result from a lack of synchronisation between the technical activities; (d) Monitor and control the technical progress per WP to ensure that the objectives are met; (e) Inform the Project Coordinator in	The entire document	The document is putting the base on how to manage the project from a technical point of view, by defining the objectives, the deliverable list and structure and the technical role of partners.

	<p>case of any deviation in the technical directions or delays in the developments; (f) Review technically the deliverables to ensure that they are compliant with the quality procedures defined for the project; (g) Provide support to external project affairs, centralising and compiling the available material from the different WPs.</p>		
<b>DELIVERABLES</b>			
<p><b>D7.3 Technical management handbook – Initial</b> Initial version of reports.</p>			

## 1.2 Deliverable Overview and Report Structure

Chapter 2 presents the workspaces of the project (where files and codes are stored) and Chapter 3 presents all the contractual documents including Grant, Consortium and Collaboration agreements. It also includes the EC guidelines on project reporting, financial issues (related to H2020 actions) along with EC reference document.

Chapter 4 describes the management structure and procedures according to the Description of the Action (DoA).

Chapter 5 presents the plan for the preparation and delivery of both the document and software oriented Deliverables, followed by Chapter 6 which describes the reporting of technical progress.

Chapter 7 describes projects’ Risk management approach and Chapter 9 lists the mitigation actions to be followed in case of delays or significant challenges.

Finally, Chapter 7 includes the conclusions.



## 2 Document and information store and tools

### 2.1 Project Repository

The project coordinator, CTTC, has setup a shared space to facilitate information exchange and file sharing between project partners. Microsoft Teams an online tool, fully compliant with all the security and General Data Protection Regulation (GDPR) [1] requirements, will be used as the project repository for the duration of the project. The Project Repository will be used by the partners as the primary location for uploading and storing files related to the 5GMediaHUB project, such as Deliverables, Meeting Minutes, Workshop Photos and other working documents.

Access to Teams Space has been arranged for all project partners. No users/persons outside the consortium have any access to this dedicated 5GMediaHUB Teams Space. The access rights are granted after communication with the project manager that also supervises this tool. To access Teams the users need to follow the link below: <https://teams.microsoft.com/l/team/19%3a523628e4677e4425b0574f6ad147c0ed%40thread.tacv2/conversations?groupId=b08c2061-322f-4966-8c44-8b7f3ff558bb&tenantId=ed36f488-a83b-4c8e-8e62-72927aed7ac6> which, after login, navigates them to the home page of Projects' Teams Homepage. which, after login (as shown in Figure 1), navigates them to the home page of Projects' Teams Homepage (Figure 2).

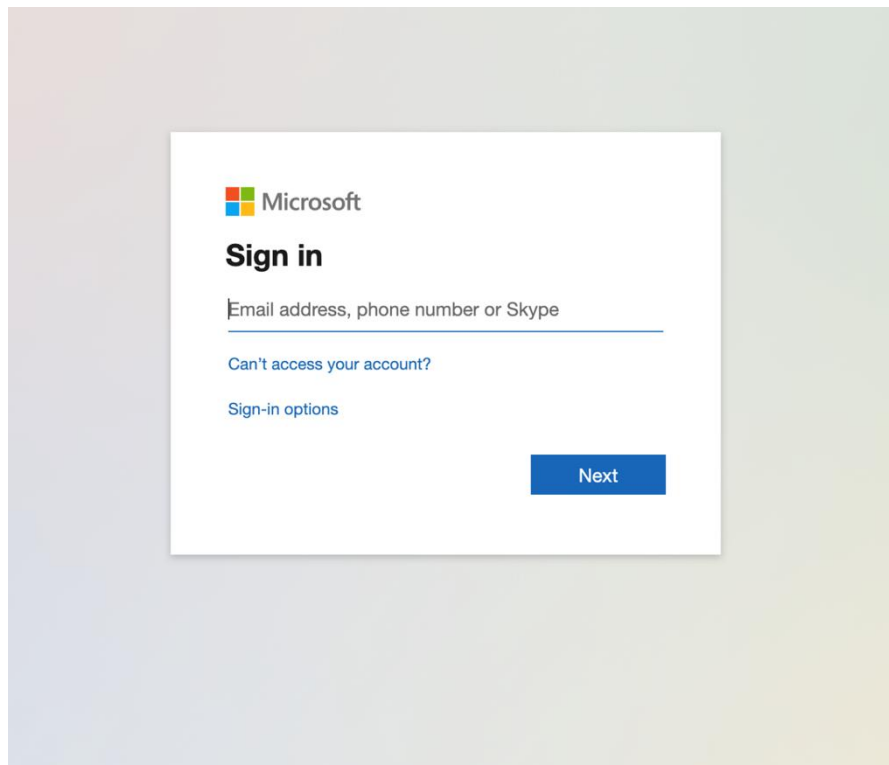


Figure 1: Login Screen

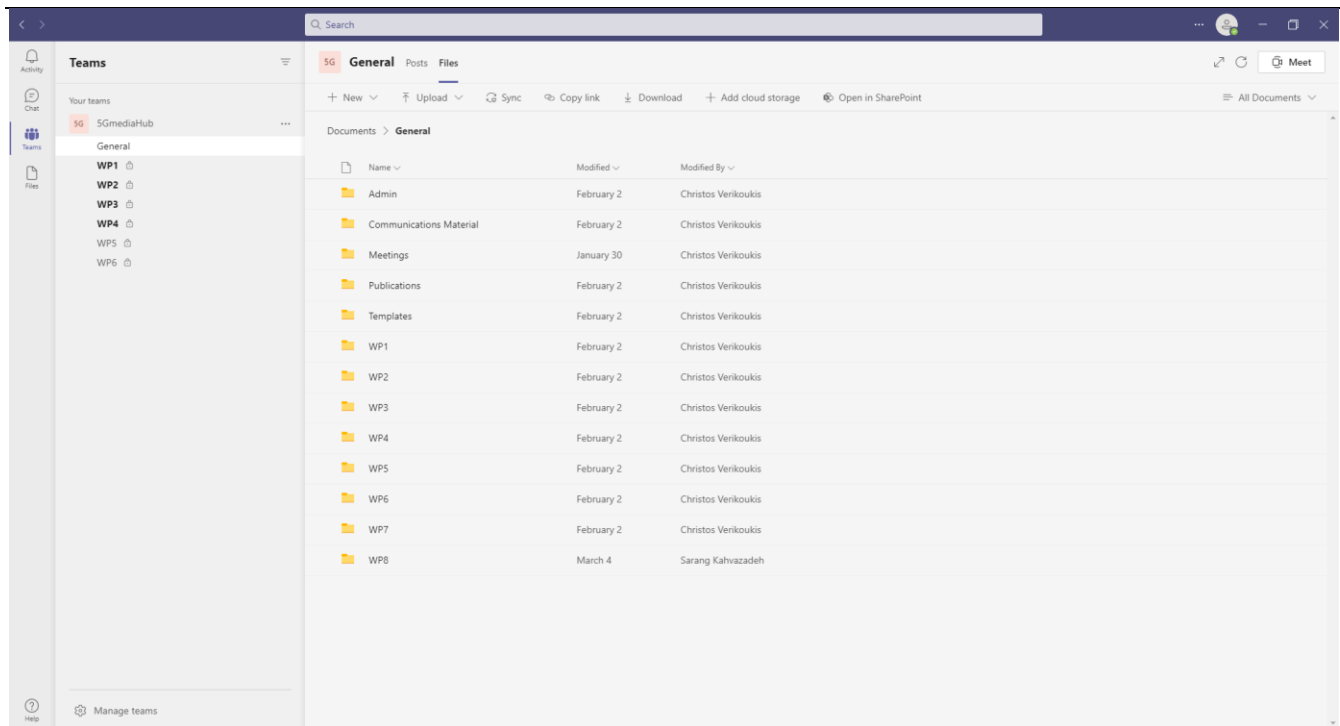


Figure 2: Teams Homepage / Files

As shown in Figure 2, there is a specific file structure where each file should be uploaded and stored. All Work Packages (WP) have dedicated folders, where the relevant Telco information, minutes and Working Documents should be uploaded. The deliverables should be uploaded on the dedicated “Deliverables” subfolder of each WP. In addition, under the “Template Documents” folder, all the necessary template files (e.g., Deliverable Template, Peer Review Template, Meeting Minutes) can be found and downloaded by the partners.

## 2.2 Tele-conferencing

In order for the different working groups and participants on each WP, to get in touch in predefined weekly, monthly, etc. meetings, and due to the fact that people cannot travel with that frequency for face-to-face meetings, teleconferences are more than necessary. This approach increases the efficiency, saves people a lot of commuting time and reduces the travel expenses.

A teleconference is the live exchange and mass articulation of information among several persons remote from one another but linked by a telecommunications system (software). The telecommunications system may support the teleconference by providing one or more of the following: audio, video, screen sharing, etc. Access to the teleconference can be achieved either by telephone, computer or by Audio-Video Terminals as applicable. Partners are free to choose the software to be used for a teleconference having in mind the accessing limitations that some partners have. The telecommunication system can be Skype<sup>1</sup>, Skype for Business<sup>2</sup>, WebEx<sup>3</sup>, GoToMeeting<sup>4</sup>, Google Meet<sup>5</sup> etc.

To run a productive and successful teleconference partners will follow a few simple guidelines, as below:

- Invite only the relevant partners that are involved to the agenda topics.

<sup>1</sup> <https://www.skype.com/en/>

<sup>2</sup> <https://www.skype.com/en/business/>

<sup>3</sup> <https://www.webex.com/>

<sup>4</sup> <https://www.gotomeeting.com/en-gb>

<sup>5</sup> <https://apps.google.com/meet/>

- 
- Distribute an agenda in advance so the participants will know what's going to be discussed or why it's important, and to prepare for active participation at the specific relevant agenda points.
  - Share links and documents in advance. An element of surprise would not help the chances of a productive teleconference. Sharing relevant documents and links will help people prepare in advance, and give them enough context.
  - Participants need to be punctual and respect people's time. Schedule the teleconference in calendar, and if there's a chance a partner won't be able to attend, be sure to inform the team.

## 3 Contractual documents and EC guidelines

The main contractual documents governing a H2020 project are:

- **Grant agreement:** agreement concluded between the European Commission and the project Partners.
- **Consortium agreement:** translation of the legal commitments that the beneficiaries assume between themselves with reference to the enhancement of the products that will derive from scientific research.
- **Collaboration agreement:** a written ‘collaboration agreement’ with the complementary beneficiaries required to all projects of the 5G PPP initiative to coordinate the work under the Agreement and the complementary grant agreements.

### 3.1 Grant Agreement

The Grant Agreement (GA) is the funding agreement concluded between the European Commission/funding agency and the project participants and specifies the rights and obligations of the contracting parties. It contains important provisions for the implementation of the project such as criteria for the eligibility of costs and provisions for handling intellectual property rights

From a technical point of view the grant agreement clearly details:

- Project Objectives
- Project DoA
- Formal commitment i.e., deliverables
- Responsibilities

The grant agreement has been signed on 29<sup>th</sup> November 2020 by EC after the signature of Project Coordinator (CTTC), following the procedure described in <http://cerneu.web.cern.ch/grant-agreement-preparation-procedure>.

With respect to the Proposal, changes of the part A and Part B of the Annex I “Description of Action” of Grant Agreement regarded the change of the Project Coordinator and slight effort/budget adjustment. No important technical modifications with respect to the proposal have been implemented.

### 3.2 Consortium Agreement

A Consortium Agreement (CA) has been concluded between all members of the consortium together with the signature of the Grant Agreement (GA), thus establishing a clear legal framework for the project.

The Consortium Agreement is based upon REGULATION (EU) No 1290/2013 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 11 December 2013 laying down the rules for the participation and dissemination in “Horizon 2020 – the Framework Programme for Research and Innovation (2014-2020)” and the European Commission Multi-beneficiary General Model Grant Agreement and its Annexes, and is made on 1<sup>st</sup> June 2019.

The document is on the basis of the MCARD-2020 model by DigitalEurope [2].

The CA complements the Description of Action (DoA), covering topics that are important for the delivery of the project and the management of knowledge between the partners, but are not specific to the consortium’s contract with the EC.

In particular in the CA are defined and regulated:

- the internal organization of the consortium of project members,
- the distribution of the Commission's financial contribution,
- the shared rules on the distribution of the contribution,
- the shared rules on the dissemination of results and intellectual property,
- the solution of possible internal conflicts,
- the agreements between participants regarding liability, compensation and confidentiality.

### 3.3 Commitment of 5GMediaHUB to 5G PPP program level

As recommended by the [5G-Infrastructure PPP working structure suggestion](#), 5GMediaHUB consortium is aware of the contractual commitment of the 5G PPP, as well as the organizational structure as described in the 5G PPP contract and its technical annex. In particular, it acknowledges the roles and commitments of the EC, the PPP partnership board, the [Networld2020 ETP](#), the 5G-IA, the Industry Advisory Group and commits to constructive interactions with these bodies. The proposal commits to work with its peer 5G PPP projects as required under the complementary Grant Agreement clause 41.4 of the 5G PPP Grant Agreement. Therefore, 5GMediaHUB consortium appointed:

- a Steering Board (SB) mandated representative (project coordinator), who will represent the project in the SB meetings and participate/contribute to the 5G PPP activities and report progress against KPIs. Dr. Christos Vekikoukis (CTTC) is appointed as SB Member. Dr. Loizos Christofi (EBOS) is appointed as deputy SB member.
- a Technology Board (TB) mandated representative (including the technical manager), who will represent the project at TB meetings and contribute fully to actions to determine the progress against the Technical KPIs. Dr. Kostas Ramantas (IQU) is appointed as TB Member. Mr. Håkon Lønsethagen (TNOR) is appointed as deputy TB member.
- representatives (and their deputies) to joint Working Groups (WGs) and to contribute to and, as necessary, edit position papers, deliverables and reports from the working groups, proactively driving working groups closely related to the project goals.

### 3.4 EC guidelines

#### 3.4.1 Guidance notes on project reporting

Project reporting templates have been published by the EC. Guidelines are available at [https://ec.europa.eu/research/participants/portal/desktop/en/funding/reference\\_docs.html#h2020-call\\_ptef-ef](https://ec.europa.eu/research/participants/portal/desktop/en/funding/reference_docs.html#h2020-call_ptef-ef)

[http://ec.europa.eu/research/participants/docs/h2020-funding-guide/grants/grant-management/reports/periodic-reports\\_en.htm#partB](http://ec.europa.eu/research/participants/docs/h2020-funding-guide/grants/grant-management/reports/periodic-reports_en.htm#partB)

#### 3.4.2 Guide to Financial Issues relating to H2020 Actions

The main source for guidance to financial issues for H2020 project is the annotated model grant agreement available at:

[http://ec.europa.eu/research/participants/data/ref/h2020/grants\\_manual/amga/h2020-amga\\_en.pdf](http://ec.europa.eu/research/participants/data/ref/h2020/grants_manual/amga/h2020-amga_en.pdf)

#### 3.4.3 EC Reference documents

The EC guidelines and other reference documents are regularly updated, and possibly laid out in self-contained documents. Be advised to regularly check the latest version of the guidelines on the EC website [http://ec.europa.eu/research/participants/portal/desktop/en/funding/reference\\_docs.html](http://ec.europa.eu/research/participants/portal/desktop/en/funding/reference_docs.html)

## 4 Management Structure and procedures (according to DoW)

The successful implementation of a collaborative research project, such as 5GMediaHUB, with **17** partners from **7** EU member states and **2** associated countries, involved in parallel, requires efficient, well-documented and structured project management procedures. Of particular importance are the clear distribution of responsibilities and the flow of information for building a common technical and commercialization vision, for reporting progress, controlling the deliverables, the milestones, and managing and mitigating the risks. The 5GMediaHUB project management structure has been streamlined to meet the objectives of all stakeholders, i.e., the European Commission and all the consortium partners by creating responsiveness to the evolving needs of the project.

### 4.1 Organizational Structure

The management structure, as shown in Figure 3 Project Management Structure Figure 3, consists of the *General Assembly (GeA)* and the *Project Management Board (PMB)*, which includes the Work Package (WP) Leaders, supported by the *Impact Maximization Team (IMT)*, an *External Advisory Board (EAB)* and a *Project Management Office (PMO)*. The structure has been designed to:

- Ensure that the project meets its **contractual obligations**, whilst providing the necessary flexibility for quick decisions. This will entail continuous progress monitoring, managed by the Project Coordinator, communication and a shared understanding of roles and responsibilities.
- Facilitate the delivery of high-quality **research and innovation**. Central to achieving this will be the coordination of the activities of the technical partners and the integration of their results.
- Maximize, measure and validate the **impact** of the system on the target audiences, both within and beyond the technology enhanced learning research and industry communities.

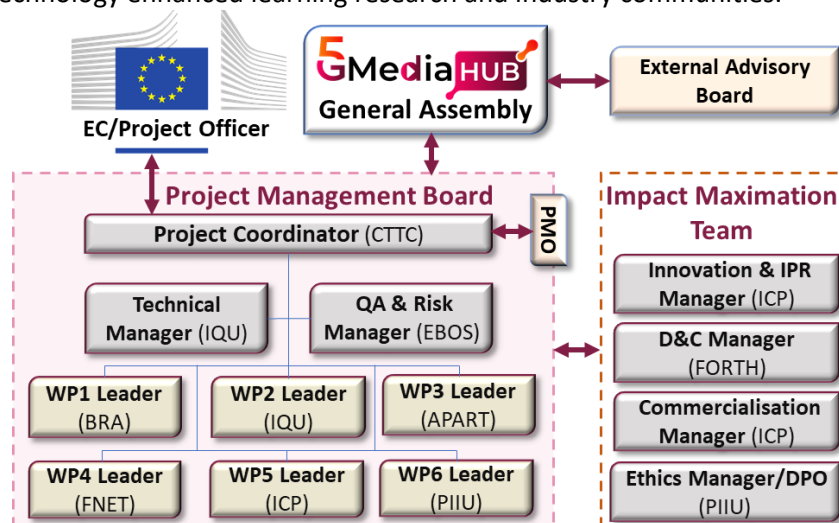


Figure 3 Project Management Structure

The PMB will focus on consortium management issues for the whole project, including technical matters, quality assurance, the Consortium Agreement, roles and responsibilities, etc., and liaison with the 5G PPP, the EAB and the EU. The related management functions, roles and procedures are described in detail in the following sections and will form the basis for the Consortium Agreement.

### 4.2 Project governance structure

**General Assembly (GeA):** Chaired by the Project Coordinator (PC), assembled once a year (i.e., in M01, M12, M24 and M36). This is the ultimate decision-making consortium body, which includes one representative from each and every partner, having the authority to make decisions on behalf of their respective organizations in terms of overall strategy and contractual aspects. The GeA appoints the chair of the Impact Maximization Team.

The meeting agenda includes: (a) Report by the PC; (b) Report by the Quality Assurance & Risk Manager on quality and risks issues; (c) Reports by the WP Leaders on technical implementation issues; (d) Approval of annual and final reports; (e) Approval of yearly implementation plans; and (f) Decisions on specific items.

**Project Management Board (PMB):** The PMB, which consists of the Project Coordinator, the Technical Manager, the Quality Assurance & Risk Manager and the six WP Leaders, the roles of which are outlined in Section 3.2.1.3, brings to the project a wealth of experience in coordinating EU projects over many years, and ensures that the project will achieve its objectives and satisfy the needs of the consortium, its target stakeholders, and ultimately the end users. To achieve this, a clear mandate from the GeA will be provided at the project’s kick-off meeting, assigning non-strategic project decisions to the PMB so that day-to-day decisions (e.g., reallocate resources and/or budget to allow for the efficient implementation of a task, or when a decision needs to be taken with short notice) can be taken in a timely manner without causing significant delays. The PMB reports to the GeA and is chaired by the PC.

**Work Package leaders (WP leaders):** Produce detailed work plans and progress reports. Guard the timely and effective execution of the WP work and that deliverables meet the quality standards. Control and monitor activities of tasks and regularly communicate, as needed, with task leaders. Manage the information flow with other WPs, monitor the WP plan and maintain consistency with the project plan. Review WP results and flag up any underperformance. Provide input to management reports. Represent the WP at the PMB.

### 4.3 Support bodies to the governance structure

**Impact Maximisation Team (IMT):** The IMT composed by the Innovation & IPR manager (IM), the Dissemination & Communication (D&C) Manager, the Commercialisation Manager (CM) and the Ethics Manager (EM), assures an effective impact maximisation management by (i) developing and constantly updating both sustainability and business plans/models for effective commercialisation of the project outcomes, (ii) defining the dissemination/communications strategy and the management of their activities, (iii) identifying and monitoring innovation and IPR issues and manage patent handling and filings, and (iv) managing ethical, privacy, gender and legal issues to ensure that the project conforms to the highest possible standards.

**External Advisory Board (EAB):** The EAB comprises a well-balanced group of external “advisors” drawn from across Europe and embracing a range of knowledge of the project’s focus areas. The EAB will offer impartial external advice from technological, scientific, market, regulation, ethical, societal, economic and business points of view. The consortium seeks to validate its technology direction with the EAB. It will be chaired by one of its members, elected upon the EAB’s first meeting in month M06. The EAB will be consulted on occasion, and will be convened at a project meeting (in M06, M18, M24, M36) to present 5GMediaHUB’ progress, decisions and designs, to hear their opinion. The consortium will take such feedback into account to correct if necessary, or to consider relevant aspects indicated by the EAB. The consortium will cover EAB travel expenses to project meetings. The following persons, whose brief CVs are presented in Annex 1 (Section 4), have explicitly confirmed their interest and willingness to participate in 5GMediaHUB EAB. Revenant Letters of Support have been provided by all EAB members (Annex 2):

1. **Stephen Fozard** (M), Project Director, Global Alliance for Media Innovation, Paris, France.
2. **Darko Ratkaj** (M), Senior Project Manager, Technology & Innovation, EBU, Geneva, Switzerland.
3. **Yuri Maria Chianese** (M), CEO, Y969, Rome, Italy.
4. **Antonio Arcidiacono** (M), Chair, 5G Media Action Group (5G-MAG) Association, Geneva, Switzerland.

**Project Management Office (PMO):** CTTC’s Financial and Administrative Support Team, which consists of highly-skilled support staff for managing financial and administrative matters. Assisting the PC, the PMO will also be responsible for general day-to-day operations required. CTTC currently coordinates two 5G PPP projects (5GCroCo and MonB5G) and participates/ed in several 5G PPP other projects, such as [5G-SOLUTIONS](#), [INSPIRE-5Gplus](#), [5GROWTH](#), [5GCAR](#), [5G-TANGO](#), etc.

## 4.4 PMB and IMT management member roles

The PMB and IMT roles are depicted in Figure 3.

### 4.5 PMB members

#### 4.5.1 Project Coordinator

The Project Coordinator (PC) is Dr. Christos VERIKOUKIS from CTTC.

**Role:** Dr. Vekikoukis is an experienced fellow scientist/project manager with a broad management profile meeting contractual deliverables and commercial outputs. Dr. Verikoukis a well-recognized scientist (h-index38, >130 journal papers, >6k citations) and science manager who has a long experience in EU Framework Programmes at both technical and administrative level and was involved in several projects, including STREPs, Marie-Curie, Celtic, ENIAC, ARTEMIS, ECSEL, H2020 as Principal Investigator, WP leader and project coordinator. Currently he is Fellow Researcher at CTTC and Head of the SMARTECH Department. He is also the coordinator of the 5G PPP MonB5G. His research group has excellent publications record and successful track record of participation in research funded projects. Dr. Verikoukis is a member of 5G PPP Vision Working Group and Expert Group of the European Technology Platform for communications networks and services (NetWorld2020). An extensive biography of Dr. Verikoukis can be found in Section 4. As 5GMediaHUB' PC, he will be responsible for the management of the project, setting strategic directions, reporting and serving as the liaison with the EC. As the PC's organisation is a founding member of the 5G PPP association, he will participate in 5G PPP Steering Board activities.

**Tasks:** Ensure efficient communication between the partners and mediation of any conflict as necessary. Follow up the project status and check progress against schedule (including budget, effort), if milestones are met and deliverables properly produced. Submit deliverables. Produce agenda, minutes. Manage the information flows between different bodies. Continuously monitor project's progress against schedule. Organise resolution procedures of consortium issues. Initiate liaison actions with other projects and initiatives. As chair of the GeA and PMB, he will be responsible for the integrative, cross-disciplinary issues of the project, for planning and for communication between the partners and the EU. Monitor the progress of the project's results and implement any necessary corrective measures. Ensure any final reports submitted to the EU are complete and accurate. Maintain team motivation, encourage creativity amongst partners and oversee all strands of work in the project, in close cooperation with the PMB and the IMT.

#### 4.5.2 Technical Manager

The Technical Manager (TM) of the project is Dr. Kostas RAMANTAS (IQU).

**Role:** Guide and monitor the technical progress of the project and coordinate the technical work amongst work packages. Generates a technical assessment of completed and running activities. Reports to GeA

**Tasks:** In strong collaboration with PBM and the WP leaders, the TM is in charge of the overall technical management and progress of the project with the following responsibilities: (i) supervision and coordination of the overall technical progress of the project; (ii) harmonisation with use case stakeholders' requirements and expectations; (iii) consolidation of the technical reports and review of technical deliverables; (iv) supervision of the testing, validation and assessment; (v) follow-up and coordination of all technical work packages;(vi) technical relationship and coordination with other relevant projects.

#### 4.5.3 Quality assurance & Risk Manager

The Quality assurance & Risk Manager (QRM) is Dr. Loizos Christofi (EBOS).

**Role:** Guide and monitor the quality plan and assess the project's risks. Ensures high-quality deliverables and fully tested and reliable software systems. Quality reviews chair. Reports to GeA.



**Tasks:** Performs project quality evaluation criteria, risk assessment, continuous monitoring, triggers quality assurance project reviews, assessment procedures, evaluation measurements and produces quality review reports. Supervises implementation of quality plan. Organises and supervises quality review/peer reviews for all deliverables. Signs off all deliverables. Alerts the PC to any quality issues.

#### 4.5.4 Work Package Leaders

The Work Package Leaders of the project are listed below:

- WP1: Javier MONTESA (BRA),
- WP2: Dr. Kostas RAMANTAS (IQU),
- WP3: Kostis TZANETTIS (APART),
- WP4: Dr. Ioannis MARCOPOULOS (FNET),
- WP5: Patrick DURKIN (ICP),
- WP6: Maurizio CECCHI (PIIU).

**Role:** Leader of a given Work Package from WP1 to WP6. Reports to the PC. Leader of WP7 is the PC.

**Tasks:** Coordinate the work to be carried out within the scope of the respective WP. Produce detailed work plans and progress reports. Monitor performance and progress of the WP with respect to the project plan. Each task leader reports to the respective WP leader, assisting in the preparation of relevant reports. Guard the timely and effective execution of the WP work and that deliverables meet the quality standards. Review WP results and flag up any underperformance. Provide input to management reports. Represent the WP at the PMB.

## 4.6 Decision-making

As per 5GMediaHUB Grant Agreement rules, decision making will strive for consensus. The general principle will be to try to achieve decisions by informal means and consensus, using formal procedures, such as voting, only when essential.

However, if the members cannot come to an agreement a voting procedure will be applied. The principles of the decision process include:

- For GeA decisions, the required majority will be a simple majority i.e., more than half of the total votes; electronic voting (e-mails) will also be used to allow all partners to vote.
- The Consortium rules will explicitly include a Silent Acceptance Clause: where the absence of a vote automatically means support for the issue

The procedures described above are designed to minimize the chance of conflicts. It is however generally expected that conflicting views will be solved bilaterally. If a conflict cannot be solved by the PMB, it must be brought forward to the GeA for a decision. The GeA will make the final decision. This decision is then binding on all management bodies. Thus, within 5GMediaHUB conflict resolution has three levels: first level – within WP, a second level conflict escalation within the Project Management Board and the third level in the General Assembly (last escalation level, Strategic issues).

## 5 Planning and development of Deliverables and Software

This Chapter is highly depending on and related with the Quality Assurance (QA) of the project and the work under T7.3 “Quality Assurance and Risk Management” which is described in detail in D7.5 “Project Quality Handbook - Initial”. For that reason, the following information is an overview of the QA procedures that needs to be followed to ensure that the Deliverables (report and software oriented) are of satisfactory level of quality in terms of both their content and presentation. Therefore, hereby we define that the Deliverables must be:

- Consistent with the description of work, in order to ensure that results are fully compliant with the Grant Agreement.
- Consistent with the project plan, in order to ensure that results contribute to the overall project’s objectives as defined by the project’s coordination team.
- Clear and readable.

In order to ensure the successful results of the QA procedures the following actions are required:

- **Progress Monitoring and Reporting.** The progress monitoring process will be performed on a monthly basis in alignment with WP Leaders reporting process via teleconference between the WP Leaders, QM and the Coordinator. Apart from the reporting on the status of each Task, WP Leaders will be also responsible to report on the status of the deliverables under their WP in order to identify possible issues or delays on an early stage. In addition, each partner should report effort and expenditures every three months. On a WP level, each WP Leader is responsible for monitoring of the Tasks and the work that has been done, or will be done by the Task Leaders. It is up to each WP Leader to setup this Task monitoring process under his/her WP.
- **Quality Assurance and Peer Reviews.** The quality procedures will have three stages as shown in Figure 4. All QA checks are highlighted in the following figure. Peer reviewers are the partners who will be responsible for reviewing the Deliverable one month before submission of the deliverable (in M-1 stage). The Partner will be asked to name the individual people within their organization that will act as peer reviewers. It was identified that the peer review process will be handled by 2 peer reviewers for each Deliverable and it needs to be completed 1 month before the final submission of the Deliverable. The 2 Peer Reviewers of each Deliverable are chosen based on their relevant expertise and experience, and they have been selected in a way which assures that they are relevant to the Task (or the WP) and with the appropriate knowledge. Authors and contributors of each deliverable are excluded from its peer review process.



Figure 4: QA Checkpoints Issue Reporting and Escalation

- On each Quality Assurance stage:
  - Both author and the WP Leader are responsible to provide a high-quality deliverable.
  - Quality Manager will perform quality check based on the quality criteria.
  - Quality Manager will report the QA results to the coordinator.
  - Delayed and low-quality deliverables will be reported as “under-performance”.

All issues need to be reported by the deliverable owner or the WP leader immediately to the Quality Manager. To ensure that all issues will be dealt with appropriately, the multiple checkpoints described

above will be implemented to give the Quality Manager the opportunity to identify (at an early stage) possible problems (technical, business or other) and bottlenecks that might affect the on-time submission of a deliverable and/or affect the project in general.

In case an issue is identified or reported (during the stages of the QA), the following mitigation actions and corrective mechanisms need to be followed:

- The Quality Manager immediately contacts both the deliverable owner and WP leader in order to discuss the issue and find a quick solution avoiding any delay on the deliverable.
  - In case the issue cannot be solved, then the Quality Manager contacts the Coordinator and informs him about the situation. All parties will discuss the issue trying to find a suitable solution.
  - In case a decision cannot be taken, and the issue persists, the Coordinator needs to contact the Project Officer and inform him about the situation.
- **Milestones monitoring.** Part of the report-oriented deliverables are also the Milestones, as identified on the DoA. Milestones are directly correlated to one or a set of deliverables and Tasks. The QA monitoring process will be performed through the procedures for report-oriented deliverables that have already been described. The successful completion of the Milestones is very important for the project's success.

## 6 Monitoring and reporting of technical progress

### 6.1 Monitoring of the technical progress of the project according to the contractual schedule

The role of WP leaders is to control and monitor activities of tasks and regularly communicate, as needed, with task leaders. Furthermore, they manage the information flow with other WPs, monitor the WP plan, maintain consistency with the project plan, and review WP results and flag up any underperformance.

Task 4.1 represent the management and monitoring task whose objective is to provide the test-bench to use case stakeholders, so as to be able to demonstrate through realistic use cases that the 5GMediaHUB Experimentation Facility supports experimenters of novel media applications and NetApps, through its underlying 5G infrastructure which supports the latest 3GPP releases (R.16 & R.17).

At project level the technical manager coordinates all the technical activities, monitoring the progress and harmonizing the work in different WPs and highlighting inconsistencies. Furthermore, he identifies trends and technologies relevant to the project and, participating in the 5G-PPP Technology Board, he is ensuring the alignment of the technical work of the Project at programme level.

The means of monitoring of the technical progress will be developed and provided for according to the D7.5 “Project Quality Handbook - Initial”.

### 6.2 Liaise with External Advisory Board (EAB) on technical matters

The EAB will offer impartial external advice from technological, scientific, market, regulation, ethical, societal, economic and business points of view. The consortium seeks to validate its technology direction with the EAB. It will be chaired by one of its members, elected upon the EAB’s first meeting. The EAB will be consulted on occasion and will be convened at a project meeting to present 5G-MediaHUB’ progress, decisions and designs, to hear their opinion. The consortium will take such feedback into account to correct if necessary, or to consider relevant aspects indicated by the EAB. The EAB will be presented with a Terms of Reference description of the EAB role. The consortium will cover EAB travel expenses to project meetings. The names of EAB members are reported in section 4.1.

### 6.3 Monitor the preparation of technical deliverables

Once defined, and agreed during first plenary meeting, the procedure for the deliverable issue the Technical manager monitors the preparation of technical deliverables, in tight contact with WP leaders. WP leaders guard the timely and effective execution of the WP work and that deliverables meet the quality standards.

Two peer reviewers for each deliverable have been selected to have a further quality check.

### 6.4 Handle issues like knowledge management

The Project defined a responsible for the management of the project’s research data. He is in care of storing and tagging procedures of research data, data classification and definition of access rules, etc. A dedicated manager is also providing support for privacy and ethical issues. Knowledge will be securely stored and maintained in an internal document management system for the use by consortium partners. The data within this work space will be maintained after the conclusion of the project for at least 2 years, so that the knowledge management will abide by the principles of discoverability, accessibility, intelligibility and availability also beyond the end of the project. Also, the project’s website and its content will be available after the conclusion of the project for at least 2 years.

### 6.5 Internal periodic reporting and reporting on milestones

During kick off meeting, the Project agreed that each Partner should report effort and expenditures figures every three months, for internal check. Management reporting is out-of-the scope of this deliverable. Nevertheless,

every beneficiary commits to write bi-annually a management report to the Project Coordinator. It will describe the technical and management project work done, mention difficulties, milestones and deliverables (or contributions to deliverables in case of joint deliverables) that have been reached, patents, publications, travel and visits.

## 6.6 Periodic technical progress report (via EC portal)

The PC coordinates, consolidates and submits to the EC the interim and final Activity Reports, deliverables and financial statements as required.

The project provides, before each review, a report detailing the work carried out per WP, giving an overview of the project results towards the objective (including summary of deliverables and milestones) and a summary of exploitable results (with an explanation about how they can/will be exploited).

A template of this report is available and it can be summarized as follows:

- Explanation of the work carried out by the beneficiaries and Overview of the progress
- Executive summary
- Progress towards objectives and significant results
- Explanation of the work carried per WP
- Impact
- Dissemination and exploitation of results
  - Scientific publications
  - Dissemination and communication activities
  - Update of the plan for exploitation and dissemination of result (if applicable)
- Update of the data management plan (if applicable)
- Follow-up of recommendations and comments from previous review(s) (if applicable)
- Deviations from DOA; Mitigations

Further information is available at [http://ec.europa.eu/research/participants/docs/h2020-funding-guide/grants/grant-management/reports/periodic-reports\\_en.htm#partB](http://ec.europa.eu/research/participants/docs/h2020-funding-guide/grants/grant-management/reports/periodic-reports_en.htm#partB)

Finally, the Project should continually update the dedicated space in the EC portal the following information:

- Critical risks
- Patents (IPR)
- Innovation
- SME impact
- Open Data
- Gender

## 7 Projects' Risks Management Approach

Risk is defined as: “an uncertain event or condition that, if it occurs, has a positive or negative effect on the objectives of a project” [3].

Risk management involves the identification and tracking of project risk using set processes, which ensure potential issues associated with project/technology implementation can be understood and addressed effectively. In relevant papers on assessing project related risks, it is suggested that for a success in managing a software project, the project manager needs to understand the nature of software risks. The results show that important weight should be placed on planning and control, requirements identification, user involvement, team, organizational environment, and project complexity.

Risks in 5GMediaHUB can be defined and monitored for different areas, such as the technology and the maturity of the applied technology, the availability of data and information, integration, stakeholders and end user’s engagement, buy-in and commitment.

The 5GMediaHUB project is a large and complex project, and the Platform integrates all aspects of business and administration activities in telecommunications, as well as a number of technologies and applications solutions. In 5GMediaHUB the business, scientific and technology risk management is certainly the responsibility of the Project Management and in general the scientific co-ordination. The management of risks is performed by interactions and regular meetings led by the Project Management Board (PMB).

5GMediaHUB is establishing an (internal) Project Risks Management framework for the systematic and efficient management of risks related to the project progress and lifecycle.

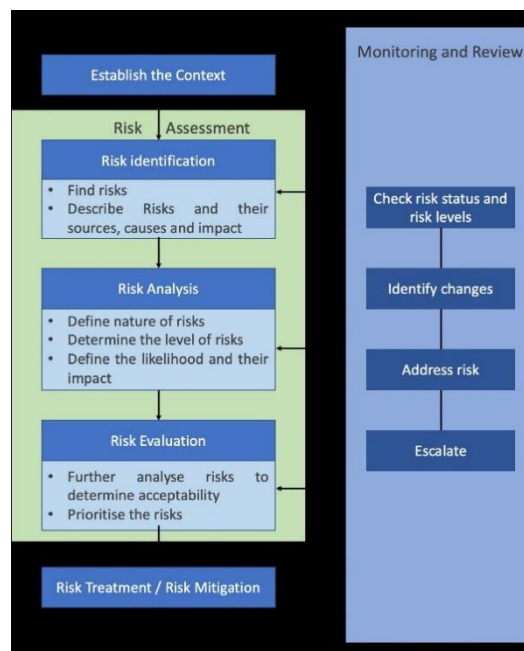


Figure 5: Risk Management Process

The following tasks relate to the establishment and the updates of the Risk Management Framework of the project, as presented in Figure 5 above:

- Establishing the context of the risk.
- Identification of risks with adverse effects or impacts – Contingency Planning and contingency actions.
- Analysis of the risk, categorization, probability of occurrence and impacts.
- Evaluation and quantification of the risks and their significance.

- 
- Risk monitoring and control of the related documentation.
  - Risk mitigation and risk management planning to identify the best way to mitigate and manage risks.
  - Risk monitoring and managing outcomes to minimize negative impact.

Risks monitoring and management will be a continually running process during the projects' lifecycle. Any issues and bottlenecks arising in the tasks will be reported:

- during monthly WP Meetings,
- during Consortium/Plenary Meetings or
- at any time from WP Leaders, Use Case owners or any other partner.

In managing risks, 5GMediaHUB is vigilant to identify and monitor all risk factors, to minimize and to limit the extent that these risk factors can affect the project. Risk identification and monitoring is an iterative process. The Risk Library of the Project, which details existing and foreseen risks, will be completed / updated regularly by each partner and examined by the Risk Manager in order to provide mitigation actions. The risk analysis process involves evaluating the risk attributes, and prioritizing (ranking) the risks.

The 5GMediaHUB project's risk analysis framework provides such a classification of risks per category, and prioritizes risk monitoring according to their likelihood to occur or otherwise probability of occurrence (low: rare, unlikely; medium: possible; and high: likely, almost certain) and their impact (low: Insignificant, minor; medium: moderate; and high: major, catastrophic or critical). The handling process of the Risks (possibility to occur x impact) follows in general four patterns of action, namely (Low Risk, Moderate Risk and High Risk). The risk mitigation involves the strategy to reduce the possibility or the impact of a risk. The Risk mitigation process tries to eliminate or resolve the risk items from the identified risks agenda.

## 8 Mitigation actions in case of delays or significant challenges

Again, this Chapter is highly depending on and related with the Quality Assurance (QA) of the project and the work under T7.3 “Quality Assurance and Risk Management” which is described in detail in D7.5 “Project Quality Handbook - Initial”. On each Quality Assurance milestones:

- Both author and the WP Leader are responsible to provide a high-quality Deliverable
- Quality Manager will perform quality check
- Quality Manager will report the QA results to the coordinator
- Delayed and low-quality Deliverables will be notified to the Quality Manager and discussed among relevant leaders, and may be reported as “under-performance” after the deliverable deadline if applicable.

Any appearing issue needs to be reported by the Task owner or the WP leader immediately to the Quality Manager. To ensure that no issue will be swept under the rug, the multiple checkpoints give the advantage to the Quality Manager to identify (in early stages) possible problems (technical, business or other) and bottlenecks that might affect the on-time submission of a Deliverable and the project in general.

In case an issue is identified or reported (during the stages of the QA), the following mitigation actions and corrective mechanisms need to be followed:

- The Quality Manager immediately contacts both the Task owner and WP leader in order to discuss the issue and find a quick solution avoiding any delay on the appropriate Deliverable. The TM will be involved if and as needed.
- In case the issue cannot be solved, then the Quality Manager contacts the Coordinator and informs him about the situation. All parties will discuss the issue trying to find a suitable solution.
- In case a decision cannot be taken, and the issue persists, the Coordinator needs to contact the Project Officer and inform him about the situation.

In addition to all the above, in D7.5 the risk management within the lifecycle of the Project has been identified to monitor the progress and take proactive measures to mitigate risks that could jeopardize the planned project outcomes.



## 9 Conclusions

The management of a big and complex project (17 Partners, 8 Work packages and more than 7.5 M€ of budget) is really complicated, impossible to accomplish without a precise management plan.

In 5GMediaHUB we decided, since the beginning, to define a person (technical manager) devoted to the technical management with some precise tasks to manage, perform and ensure the provision of:

- supervision and coordination of the overall technical progress of the project
- harmonization with use case stakeholders' requirements and expectations
- consolidation of the technical reports and review of technical deliverables
- supervision of the testing, validation and assessment
- follow-up and coordination of all technical work packages
- technical relationship and coordination with other relevant projects.

Apart from the Technical Manager, Work package leaders will support the technical management and have been assigned effort under this task.

Finally, an external advisory board has been established in order to receive independent inputs towards adoption and take-up actions on technical matters

The present document represents the initial version, where we report the technical management organization and the plan to be implemented. On month 36 of 5GMediaHUB lifetime, we will provide a final version where we will detail the implementations of the management, the issues we will probably encounter and the lessons learned.

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## References

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