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OPTIMised video content delivery chains leveraging data analysis over joint multi-access edge computing and 5G radio network infrastructures



OPTIMIST

**WP7– Dissemination, Standardisation, and Exploitation
Deliverable D7.2 “Dissemination, communication, standardization, public engagement plan”**

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Executive Summary

The main objective of WP7 is the dissemination of the results obtained within OPTIMIST, in order to ensure the visibility of the project, promote its goals and enable the exploitation of its achievements. This deliverable presents a plan of the relevant activities that should take place throughout the project. These activities include the publication of the obtained results in scientific journals and conferences, the participation to standardization bodies and the dissemination of information to special interest groups related with project outcomes, such as telecom operators and over the top service providers. The plans presented in this document are preliminary only and are subject to further refinements and updates during the course of the project.



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1 Introduction

OPTIMIST aims to develop a modular end-to-end service platform tailored to the optimized delivery of personalised video content in 5G mobile networks, providing one of the first world-wide implementations of MEC-enabled service provisioning in 5G networks that is fully compatible with the emerging ETSI/3GPP reference architectures. To achieve this, the OPTIMIST service platform will design and implement different MEC services, which are currently studied in an isolated fashion in current literature, (e.g. edge network caching exploiting edge storage resources, video transcoding and data-driven content popularity prediction exploiting edge processing resources, optimized video content placement and delivery exploiting the new 5G radio capabilities), in the form of virtual network functions (VNFs) that are instantiated and optimized on-the-fly to construct a video service chain that is designed to meet the personalized requirements of 5G mobile video consumers.

The technical contributions of OPTIMIST are, without doubt, the main priority of the project. However, the dissemination of the developed ideas and the obtained results to a wide audience, ranging from the research community to non-scientific public, is critical for the overall success and the impact of the project on society. WP7 aims to increase the visibility of OPTIMIST by coordinating the activities related to the dissemination of the results and the exploitation of the proposed solutions. This deliverable identifies the key dissemination activities that should be taken and provides an action plan that should be followed during the whole duration of the project. Some first steps taken during the first year of the project will also be described. However, the main dissemination activities are expected to take place in the following years, based on the obtained technical achievements of the project’s technical related WPs.

2 Dissemination strategy

Dissemination is a process requiring a careful match among (a) the creation of products or knowledge, and the context of that creation, (b) the target audiences, and (c) the content, media, formats, and language used in getting the outcomes into the hands (and minds) of those target audiences. It is far more than the simple distribution of paper or products.

The goal of all dissemination should be utilization. Utilization may mean different things to different members of a target audience; in some cases, it may mean rejection of a product or research finding. The critical element of utilization is that the research outcome must be critically and thoroughly digested, and the individual must fit the new information with her or his prior understandings and experience. One of the most effective ways to increase utilization - and to improve the quality and relevance of research - is to involve potential users in planning and implementation of the research design itself. Effective dissemination and utilization require an understanding of the change process, while it is critically linked to its



timeliness and comprehensiveness.

The dissemination objectives for OPTIMIST are:

- to ensure that the results of the project are properly disseminated to the appropriate acceptors,
- to transfer the knowledge gained in the project to the appropriate acceptors,
- to ensure appropriate exploitation of the project results (also after the project has finished),
- to introduce the technology to developers, researchers and users (knowledge transfer),
- to study and analyze the socio-economic issues related to the project outcomes.

Dissemination has been described as a process of making results of projects available for a target public. The dissemination process consists of “actions for dissemination” which may be classified according to several criteria. The most obvious is the type of activities, but it is also possible to distinguish between “extensive” and “intensive” actions, as well as between “ad hoc” and “embedded”. In general terms “extensive actions” refer to infrastructural actions supporting dissemination, while “intensive actions” include those which may produce specific dissemination results, such as influence on university management or dissemination of good practice in project management.

For OPTIMIST, “ad-hoc actions” are those that are generated/designed explicitly to promote one given output or series of outputs of the same project: e.g., a conference to present the project results, a publication summarising a completed survey, etc; “embedded actions” include all those approaches which inject dissemination of an output into existing activities (e.g.: events, publications, networks, etc.) which are already addressing a given target. The latter actions have the advantage of reducing dissemination costs, and capturing broader audiences, including those that are not specific to the output subject area. To this end, they are more suitable to non-material outputs rather than to material outputs.

As most of the project partners are producers of knowledge and know-how, the need to disseminate our work is part of our activity. It can be a slow and sometimes difficult task to transfer know-how into the practice setting, but planning effective dissemination strategies is part of this process. Dissemination planning involves not only looking at where and when the information should be disseminated, but what should be communicated and how it should be presented. These steps maximize its relevance, usefulness and accessibility.

Dissemination of results is a contractual obligation of participation in research initiatives supported under the European Union. The specific aims of this provision are to promote knowledge sharing, greater public awareness, transparency, and education. Consortia are required to provide tangible proof that collaborative research not only exists, but also



contributes to the society in terms of academic excellence, industrial competitiveness, employment opportunities, environmental improvements and enhanced quality of life for all. Especially in our case, where the outcome of the OPTIMIST project is a highly tangible result, i.e. a network application for direct use by the end-users, the need to disseminate the results at a wider audience is even more important.

The dissemination strategy can be explained as the combination of any appropriate tools to present, make known and accessible research results to a specific target audience, through clear and specific messages in a certain period of time. In settling a dissemination strategy, researchers should consider five key factors:

- **Project objectives:** What is the main objective of the project? What are the sub-goals of the project? What are the expected results? How they will serve the needs of the target beneficiaries related to the objectives of the project?
- **Target audience:** For which target audience should a specific result and/or the overall result of the project be disseminated? What is the significance of that result(s) for that target group? Are the target beneficiaries likely to realize the significance or do they need specific assistance to understand the benefits for them?
- **Goal:** What are the objectives and goals of the dissemination effort? What impact is the dissemination plan aimed at producing?
- **Medium:** What are the most effective channels and tools to reach target audience? Which methods fit best to their level of awareness and understanding? Which resources are necessary? How to combine the utilization of different tools in an effective way?
- **Execution:** When should the dissemination activities be implemented (e.g. at which points during the study and afterwards)? Who will be responsible for dissemination activities? Will the potential users be involved into the discussion of the results and will their feedback used to improve the applicability of the final results?

3 Dissemination activities

Dissemination is a process requiring a careful match among (a) the creation of products or

In full compliance with the contractual arrangements, OPTIMIST will ensure that the results of the fellows’ research are disseminated and exploited by the people, business and society through the following activities.

i) Website: A project website will be setup by FOG at M3, to provide general project



information (e.g., objectives, consortium), key events and milestones, public documents (e.g., deliverables) and communication material (e.g. e-newsletters), including links to Social media (e.g., Twitter), fellows’ presentation and roles. A private section for members will be also established, with information on the training activities and coordination. It is estimated that more than 10K visitors will visit OPTIMIST’s website by the end of the project.

ii) Conference and journal publications: Scientific publications will be one of the main dissemination mechanisms of the project, targeting journals and magazines with high Impact Factor (e.g., IEEE Trans. on Commun., on Wireless Commun., IEEE Access, IEEE Comm. Mag., etc.) and flagship conferences, especially for intermediate results (IEEE ICC, GLOBECOM, etc.). All partners will participate in practical demonstrations presented at specialized workshops, exhibitions and events (e.g. IEEE CAMAD, IEEE SIGCOM). It is expected that, on the average, each beneficiary will publish close to 3 conference and 2 journal papers. UAQ will coordinate the activity.

iii) Workshops/conference organization: OPTIMIST will organize two workshops (M20 by UAQ/FOG and M34 by UOA/WST) and one final conference (M42 by CTTC, IQU), which will be open to academic and industrial communities and co-located with important IEEE conferences (e.g., IEEE ICC, GLOBECOM, EuCNC), aiming to disseminate a unified view of current project activities and achievements. Fellows will present their results in the workshops, receiving valuable feedback for their work. Project achievements will be shown at the final conference. It is expected that around 100 people will attend each workshop and more than 200 people will attend the conference.

iv) Industrial Dissemination Day (IDD): One IDD (M32– FOG/UOA) will be organized, enabling OPTIMIST fellows to present results to industrial experts, potentially exploiting co-location of similar events organized by the partners (e.g. UOA/COSMOTE Hackathon) to provide valuable networking and feedback to the fellows while maximizing the project visibility. During the IDDs, industry-focused keynotes will be presented, while sessions for oral, poster and demo presentation will be organized. Through IDDs, all fellows will be given the opportunity to apply theoretical knowledge and skills to significant practical problems, further to establishing links with other industry and academic partners (e.g. for fostering new career opportunities and future collaborations).

v) Open access engagement: OPTIMIST commits to open access, either through gold open access (e.g. IEEE Access Journal) or through open access repositories (e.g. arXiv), including ZENODO (i.e. EC-supported open data repository at CTTC, with the capability to automatically integrate uploaded publications in the Open Access Infrastructure for Research in EU and the RECOLECTA repositories). All publications will be available through OpenAire.eu. Code and datasets will be made available in line with confidentiality and security restrictions (Art. 29.3). These measures will ensure transparency and reproducibility of research, while maximizing



project visibility. WST will lead the activity, exploiting its previous experience in the use of open-source repositories (e.g. Github).

vi) Participation in IEEE Technical Committees (TC): TCs foster different forms of information exchange in multi-disciplinary fields of wireless networking (e.g., standardization, workshops). OPTIMIST will be present at IEEE TCs, e.g. by creating special interest groups, exploiting the active participation of the consortium in IEEE TCs (e.g., CTTC is officer of the IEEE Communications Systems Integration and Modelling – CSIM TC). Fellows will become members of relevant TCs and attend meetings co-located with IEEE flagship conferences (e.g., ICC, GLOBECOM), to present and discuss steps toward standardization. CTTC will lead the activity.

vii) 5GPPP: OPTIMIST will exploit the presence of beneficiaries in 5GPPP projects (e.g. FOG, IQU and CTTC), to articulate the results of seconded fellows through multiple channels (white papers, presentations, etc.), consolidating the OPTIMIST viewpoint in working groups (WGs), such as the 5G Architecture (IQU is member), the Network Management & QoS and the SME WGs (FOG is member of both WGs). FOG will coordinate this activity.

4 Communication and public engagement

4.1 Communication activities

The OPTIMIST communication strategy starts at the outset of the action and continues throughout its entire lifetime, while it is strategically planned to effectively promote results to wider audiences. A specific WP, tasks and deliverables have been planned to this end (WP7), forming a continuous communication process with a specific timeline involving all partners and fellow researchers. The vast experience of project beneficiaries in the field (e.g. UOA, CTTC) guarantees the OPTIMIST’s communication efficiency.

i) **Brochures:** We will issue three brochures summarizing the activity, innovations and potential impact of the OPTIMIST solutions and 5G in the daily life of EU citizens, in a more open and less scientific way. Brochures will be available in English, Spanish, Greek, and Italian and will be disseminated to city councils, local universities, schools, recreational areas, etc., at M18, M33 and M48. Through this channel, OPTIMIST aims to reach a total of at least 2K individuals of the general public. WST will lead this activity.

ii) **Social media:** OPTIMIST will create and manage accounts in social media by M3 (Twitter, LinkedIn, etc.), which will be used as channels for providing information to the general public regarding the events, activities and advances of the project. OPTIMIST aims to 3 posts per month and reaching at least 100 individuals monthly. IQU is leader.



iii) E-newsletters: E-newsletters will be issued every 6 months (starting at M12) in the project website/social media and delivered through (at least 10) institutional and technical mailing lists, advertising the OPTIMIST achievements (e.g., technologies, demos), events (e.g., workshops) and activities to key stakeholders (e.g. 5GPPP, MNOs, experts). They will include interviews of the fellows, stressing the impact of their participation in EU actions in their career and life, aiming to attract attention of at least 200 academic students per issue. UAQ will lead the activity.

iv) Multimedia content to target public: We will set up a YouTube channel for the project, including i) two trailers on plans, activities, and achievements of the project (M24, M42), and iii) at least one interview per beneficiary (partner), highlighting how EU-funding and OPTIMIST promotes academic/industrial innovation (M32). The material will be also made available through the project website. We target to reach at least 5K technology enthusiasts and individuals of the general public (measured in total video views). UOA will lead this activity.

v) Industrial Exhibitions: OPTIMIST innovations will be presented through stands/demos of working testbeds in at least two industry-attended events (e.g., Mobile World Congress-110k visitors, 5G World-10k visitors), or events organized by the EC (e.g. 5G Summit, RAN World) close to M33 and M40. This activity will increase the awareness of industrial stakeholders on the OPTIMIST results (target at least 20K individuals). IQU will lead the activity.

4.2 Public engagement activities

These strategies foster the interaction of OPTIMIST researchers with the general public (e.g., non-scientists, students at schools/universities), to present the impact of the project’s results on everyday life as well as to create awareness over 5G network services and vertical applications. OPTIMIST’s public engagement strategy is carefully planned, provisioning for timely contributions of all involved beneficiaries:

i) Public talks: Each ESR will give at least one public talk at different local associations, universities, science festivals, high-schools, etc., with an estimated 80-120 audience per talk. Fellows will explain open issues in a didactic manner (with examples and hands-on activities) to promote fruitful discussions with attendees, explain the research carried out in the EU and generate interest for science and technology. CTTC will lead this activity.

ii) OPTIMIST Hackathon: UOA has plans for a 5G Hackathon event together with the local MNO COSMOTE, targeting to deepen their collaboration towards the 5G pilot setup in UOA’s campus. UOA will adapt the context of this event and allow for a special track on MEC-empowered service provisioning in 5G (M35) with wide participation of programmers, engineers, students and other, reaching up to 150 participants. Fellows will setup their own teams, directly interacting with external experts and enthusiasts. UOA will lead this activity.



iii) Open Days: OPTIMIST will organize two open days around M26, M39, collocated with existing events (e.g., Science Week in CTTC, EU Researcher’s Night in L’Aquila and Athens), with a target 300-400 audience of school students, engaging students in a research environment and familiarizing them with EU-funded actions. Experimental demonstrations, hands-on sessions and applied examples will be prepared by the fellows. WST leads the activity.

iv) Frequently Asked Questions (FAQ) Blog: A Blog to FAQs on OPTIMIST research will be integrated in the website by M19. Seconded fellows will contribute with at least one post during their secondment. The blog will help the general public (target: 100 visits per month average) to understand practical aspects of the project, becoming a reference point to encourage two-way communications through public posts/answers. FOG will lead this activity.

5 Standardization

OPTIMIST will address in a holistic fashion the challenging problem of MEC/RAN integration in 5G networks under the meaningful concept of delivering large volumes of fully personalized 5G mobile video content, accelerating and optimizing MEC-empowered service provisioning with prediction-driven service automation (data analytics, model-based decision support) in line with the recently-released ETSI MEC reference architecture and the 3GPP NR standard. To this end, the OPTIMIST software platform will integrate SotA service modules that will be specialized to the optimization of different parts of the e2e video content delivery chain, domains that in current literature are handled independently and are in general loosely integrated. For example, although current literature includes a plethora of studies promoting the concept of edge network caching (i.e. proactive placement of video content close to end users during off-peak periods to reduce congestion and delays during on-peak periods), current market still lacks of products that can smoothly interact with 5G networks or MEC-empowered servers towards improving the QoE at the video consumers’ side (e.g. by incorporating information on the 5G radio status, or encompassing MEC-enabled proximity estimation). Similar arguments can be made for the existence of protocols that can readily incorporate up-to-date knowledge on the availability of different bitrates of the same cached video (near the end users) during the deployment of DASH, an emerging technology that enables mobile terminals to dynamically adapt the bitrate of the consumed video in line with the network status. Besides, support of stateful services over MEC-enabled infrastructures dictates more sophisticated mobility management across loosely-coupled systems to guarantee service continuity, through the seamless transfer of specific context and content from one MEC server to another (across the route followed by the mobile user).

OPTIMIST will target at closely following and potentially contributing to the ongoing 5G and



MEC standardization activities, leveraging the participation of OPTIMIST partners in relevant standardization bodies (e.g. CTTC in ETSI, FOG in 5GPPP), setting the ambitious aim to achieve one impactful contribution in relevant standards and two presentations/posters in workshops/meetings organized by the following bodies: 1) IETF (Internet Engineering Task Force) in the traffic engineering and signalling (TEAS) working group (WG) with research outcomes on cross-platform and inter-host management (IQU), 2) 3GPP in management operations for NFV and SFC (IQU), 3) ETSI (European Telecommunications Standards Institute) in the ETSI MEC group with the OPTIMIST service architecture integrating 5G and MEC services (by CTTC), 4) ITU: CTTC will aim to contribute to the new ITU-T focus group on “ML for Future Networks including 5G” (FG-ML5G) with the OPTIMIST innovations on data-driven prediction for 5G MEC/RAN services. CTTC will coordinate this activity.