Project Title	AN OPEN, TRUSTED FOG COMPUTING PLATFORM FACILITATING THE DEPLOYMENT, ORCHESTRATION AND MANAGEMENT OF SCALABLE, HETEROGENEOUS AND SECURE IOT SERVICES AND CROSS-CLOUD APPS
Project Acronym	RAINBOW
Grant Agreement No	871403
Instrument	Research and Innovation action
Call / Topic	H2020-ICT-2019-2020 / Cloud Computing
Start Date of Project	01/01/2020
Duration of Project	36 months

D7.6 – Communication Activities Report – Version 1

Work Package	WP7 – Dissemination, Exploitation and Communication
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Due Date	30.06.2021
Actual Date of Submission	30.06.2021
Version	V1.0

Dissemination Level

X	PU: Public (*on-line platform)
	PP: Restricted to other programme participants (including the Commission)
	RE: Restricted to a group specified by the consortium (including the Commission)
	CO: Confidential, only for members of the consortium (including the Commission)

The work described in this document has been conducted within the project RAINBOW. This project has received funding from the European Union's Horizon 2020 (H2020) research and innovation programme under the Grant Agreement no 871403. This document does not represent the opinion of the European Union, and the European Union is not responsible for any use that might be made of such content.

Versioning and contribution history

Version	Date	Author	Notes
0.1	24.02.2021	George Amponis (K3Y), Savvas Ouzounidis (K3Y), Maria Zevgara (K3Y)	Document Structure
0.2	09.06.2021	George Amponis (K3Y), Savvas Ouzounidis (K3Y), Maria Zevgara (K3Y)	Initial version
0.3	14.06.2021	George Amponis (K3Y), Savvas Ouzounidis (K3Y), Maria Zevgara (K3Y)	RAINBOW Social Media Presence
0.4	15.06.2021	George Amponis (K3Y), Savvas Ouzounidis (K3Y), Maria Zevgara (K3Y)	RAINBOW Website
0.5	16.06.2021	George Amponis (K3Y), Savvas Ouzounidis (K3Y), Maria Zevgara (K3Y)	RAINBOW Blog
0.6	17.06.2021	George Amponis (K3Y), Savvas Ouzounidis (K3Y), Maria Zevgara (K3Y)	Traditional Media, Communication Material
0.7	18.06.2021	George Amponis (K3Y), Savvas Ouzounidis (K3Y), Maria Zevgara (K3Y)	Introduction, Communication Mechanisms, Conclusions
0.8	23.06.2021	Christina Stratigaki (UBITECH)	Peer Review #1
0.9	23.06.2021	Vasileios Psomiadis (AUTH)	Peer Review #2
0.9	24.06.2021	Savvas Ouzounidis (K3Y)	Adressing reviewers comments
1.0	30.06.2021	George Amponis (K3Y), Savvas Ouzounidis (K3Y), Maria Zevgara (K3Y), Christina Stratigaki (UBITECH)	Final version

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List of abbreviations

AI	Artificial Intelligence
COVID-19	Coronavirus disease of 2019
CPC	Cost-Per-Click
DIN	Deutsches Institut für Normung
EC	European Commission
ETSI	European Telecommunications Standards Institute
HPC	High Performance Computing
ICT	Information and Communications Technology
IEC	International Electrotechnical Commission
IoT	Internet of Things
ISO	International Organization for Standardization
KPIs	Key Performance Indicators
OASIS	Organization for the Advancement of Structured Information Standards
SEO	Search Engine Optimization
SMEs	Small and medium-sized enterprises
TOSCA	Topology and Orchestration Specification for Cloud Applications
URL	Uniform Resource Locator
WP	Word Package

Executive Summary

The vision of RAINBOW is to design and develop an open and trusted fog computing platform that facilitates the deployment and management of scalable, heterogeneous and secure IoT services and cross-cloud applications. With RAINBOW, fog computing can reach its true potential by providing the deployment, orchestration, network fabric and data management for scalable and secure edge applications, addressing the need to timely process the ever-increasing amount of data continuously gathered from heterogeneous IoT devices and appliances.

This document represents the deliverable D7.6 *"Communication Activities Report - Version 1"*. It is the first deliverable coming out of WP7, which describes the communication activities that were pursued during the first half of the project (M1-M18), as well as the means used to accomplish the objectives set for this reporting period.

This deliverable contains a detailed description of all related activities and the specific channels such as the project website, social media, newsletters, brochures, etc. used, regarding communication purposes of the project, fully implementing the online and offline dissemination strategy clearly defined in deliverable D7.1 "Communication Roadmap and Data Management Plan" (M3). The communication strategy is the point of reference for the execution of the respective activities throughout the project duration. We must note that communication activities during the first half of the project were accomplished only virtually due to the impact of COVID-19.

1 Introduction

1.1 Purpose of the Communication Activities Report

Effective communication is fundamental to ensure the RAINBOW's messages are received by the identified stakeholders. It is crucial to utilize the appropriate methods and channels to reach each targeted audience. Under this scope RAINBOW implements a modern and inclusive communication strategy; defines clear objectives related with each target group; sets up the different channels, tools and mechanisms required to engage audiences; and puts into action an iterative learning process, which will allow for feedback gathering and interpretation of the corresponding insights. All actions that contribute to the diffusion of the project's results beyond the consortium and the direct stakeholders are considered as communication activities. [1] [2]
This deliverable lies under the Task 7.3 and aims to provide a detailed account of all communication efforts carried out by the RAINBOW project partners during the first 18 months and those that are planned for the next few months. During the first half of the project there was frequent and close collaboration with the WP7 leader AUTH on several issues. Moreover, AUTH provided guidance regarding the communication activities. This is the first report, with another one following at the end of the third year. Therefore, it will present all communication material produced during these months such as the project website, logo, newsletters, flyer, brochure, created social media, video, etc. In addition, this document also includes a list of KPIs as they were defined in the communication plan, and the performance of the project with respect to those KPIs.

1.2 Structure of this Document

The remainder of this document is organized as follows:

- **Section 2 – Communication Mechanisms**: Section 2 provides the communication mechanisms in terms of the objectives, a roadmap and the KPIs targets.
- **Section 3 – RAINBOW Website**: Section 3 provides a detailed presentation of the website, the "on-site" actions regarding SEO and finally the data analytics about the website metrics.
- **Section 4 – RAINBOW Social Media Presence**: Section 4 is devoted to describing the social media channels of the project.
- **Section 5 – RAINBOW Blog**: Section 5 presents the blog/news page which contains important information such as news, events related with the project and articles on specific topics within RAINBOW.
- **Section 6 – Traditional Media**: Section 6 includes the press releases issued on important aspects regarding the project.
- **Section 7 – Communication Material**: Section 7 presents important communication material around the project.
- **Section 8 – Conclusions**: Section 8 concludes this document.
- **Section 9 – References**: Section 9 includes a relevant list of references.

2 Communication Mechanisms

2.1 RAINBOW target audience

RAINBOW aims for a wide reach among audiences originating from various domains. The target audiences for the communication of the project are the direct target groups or users of the outcomes and results, as well as key stakeholders for the exploitation and market uptake of RAINBOW's achievements.

Group A: Software and Application Developers
Eclipse open-source community; Individual developers and companies developing business software and applications on Edge/Fog Computing, Cloud/HPC, IoT, AI, Big Data, etc.

Group B: ICT Industry
SMEs and Large Enterprises providing services and/or infrastructures.

Group C: Researchers and Academia
Individual researchers engaged in research initiatives and/or working in research/academic institutes.

Group D: Industry Associations & Technology Clusters
Associations, initiatives and clusters like Industrial Internet Consortium (IIC™), Edge Computing Consortium Europe (ECCE), OpenEdge Computing, Eclipse.org, European Technology Platforms, Digital Europe etc.

Group E: Standardisation Organisations
OASIS, TOSCA, ISO/IEC IEC, DIN, ETSI, etc.

Group F: Policy-makers
EC Directorates/Units, Governments and Governmental Organisations, Regulatory Agencies, etc.

Group G: General public
End-users of Fog/Edge Services

2.2 Objectives of the Communication Activities

The main objective of the communication activities is to maximize the project's innovation potential and attract a wide range of stakeholders who are invited to embrace the project's results and benefit from its advancements. In this direction, the RAINBOW communication strategy aspires to achieve the following goals:

Communication Objectives	Target Audiences
CO.I Create awareness of the project among the full range of potential adopters/users	A - G
CO.II Provide a clear view of the project's concept, goals and results by formulating adapted key messages and preparing communication material	A - G
CO.III Create an active community of potential users and collect feedback to be taken into account by the project's activities	A, B, C, F, G
CO.IV Prepare the ground for the exploitation of project's results	A – G
CO.V Support targeted dissemination of the project's results	A – G

Table 1: Communication objectives and target audiences

The communication roadmap, consists of three annual phases. A set of communication mechanisms and channels to support the defined objectives are presented with a gradually increasing intensity from phase to phase. The communication roadmap also contained in D7.1 [2]

2.3 KPIs Targets

The monitoring of communication activities is an essential process to evaluate the success and efficiency of the plan. A set of Key Performance Indicators (KPIs) were defined in the Grant Agreement [1], with their impact being analysed in D7.1. The aforementioned KPIs enable us to monitor the progress and impact of the communication activities and act as guidance in order to help the consortium to take corrective measures when is needed. The next table presents and summarizes the KPIs that were introduced in D7.1 and an update on the current achieved status considering their targeted values:

Communication Mechanism	Related KPIs	Targets	Current Status
CM1 Project's website	• **Unique Visitors** • **Average duration of visits** • **Page views**	**5,000** **2 min** **10,000**	**2,092** **02:29** **9,424**
CM2 Social media presence	• **Accumulative followers** • **Accumulative posts** • **Interactions**	**750** **1,000** **250**	**393** **205** **>250**

Communication Mechanism	Related KPIs	Targets	Current Status
CM3 Project's blog	• **Posts** • **Interactions**	**100** **100**	**19** **<100**
CM4 Traditional media	• **Press releases**	**10**	**1**
CM5 Communication material	• **Project's factsheets, brochures and banners** • **e-Newsletters** • **Videos** • **Blog Posts in EC**	**6** **12** **1** **3**	**2** **4** **0** **0**

Table 2: Communication Mechanisms KPIs, targeted values and current status

The assessment of each of the KPIs is presented detailed in the following sections.

3 RAINBOW Website

3.1 Project identity

The RAINBOW website (https://rainbow-h2020.eu) went live during M3 and is considered as one of the major channels regarding information and communication. It serves as a place to provide access to some of the public deliverables and freely available publications, case studies (demonstrators), RAINBOW news, etc. Moreover, there is dedicated space for accessing dissemination materials such as leaflets, brochures, newsletters, videos, etc. In addition, it also allows to promote the RAINBOW solution to its end-users. Therefore, it is being continuously monitored and updated; it has also undergone few major changes in order to develop a more attractive end-user orientated environment. Its structure and layout are interrelated with the main goals of WP7, in order to be able to disseminate the project results to the general public, experts in the field and to engage key stakeholders.
This site will be kept updated and improved during the project lifetime, presenting new content and functionality, under the responsibility of WP7 leader AUTH.

3.1.1 Website sections and content

The web site was recently revamped compared to the original version delivered on M3 (see D7.1): In general, changes took place regarding texts and visualization. Currently (M17), the RAINBOW website has the following distinct areas:

i) **Landing page**. In the landing page significant changes occurred during the last revamping. The main menu was restructured, the Use Cases & KPIs have been removed from the front page. There is now a slider which contains images along with text, with a respective *"read more"* button for each section regarding the RAINBOW platform (Figure 1). Each transition in the animation flow is happening every 12 seconds.

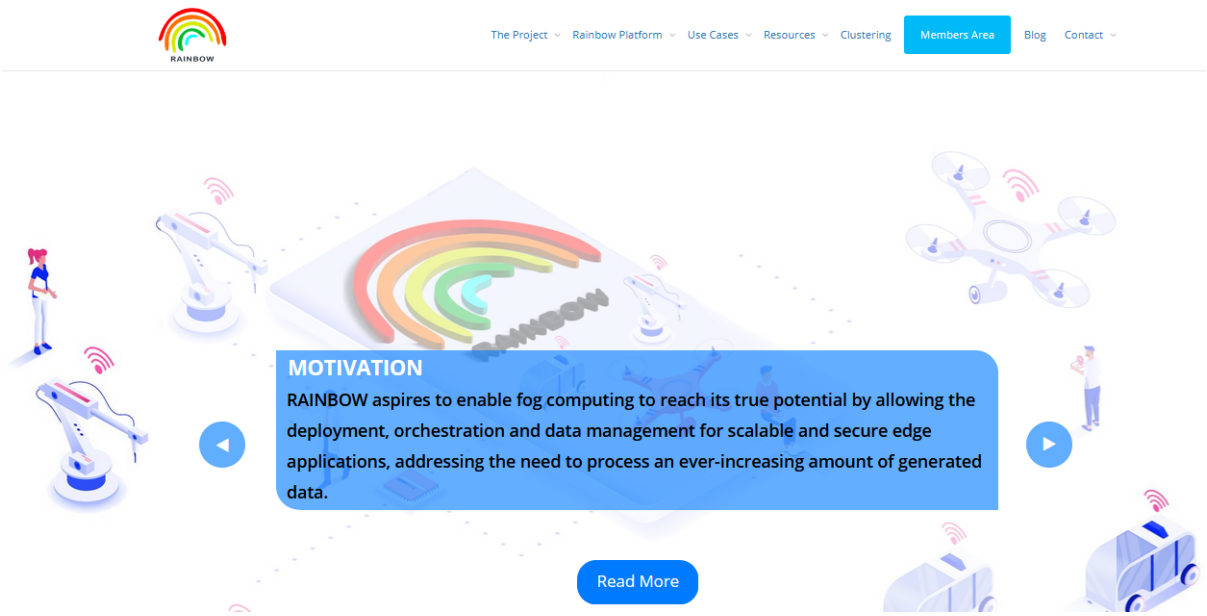
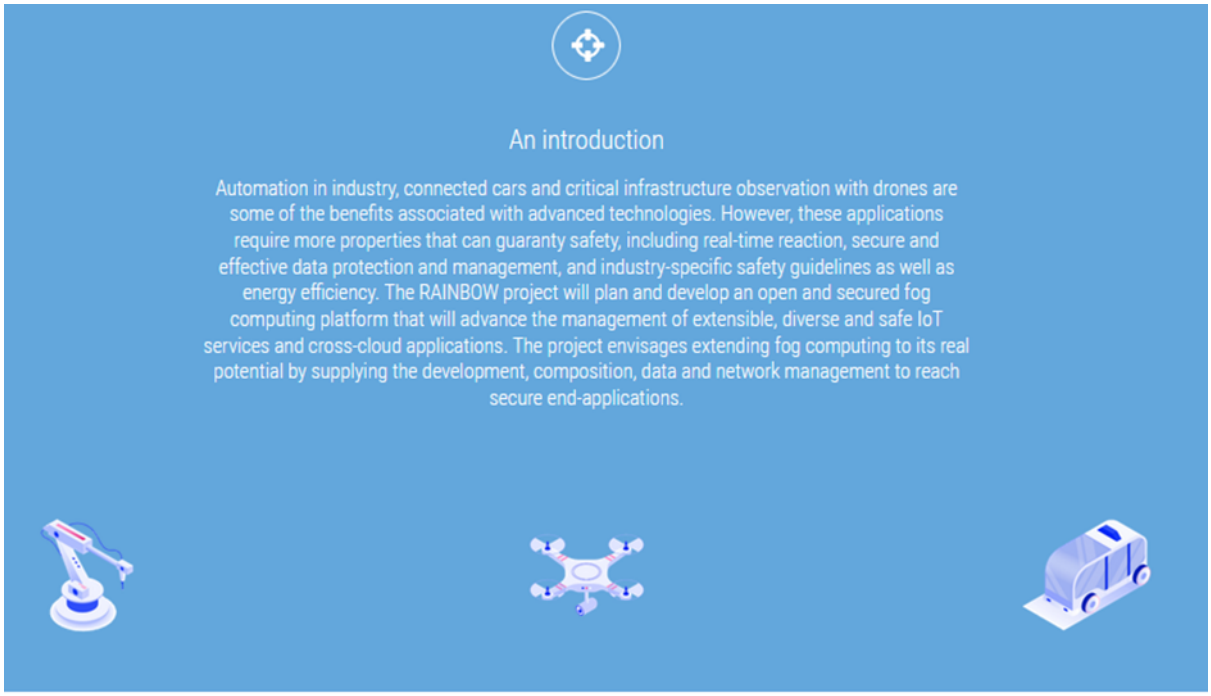


Figure 1: Landing Page Slider

Below the slider, there is an introduction of the project and the section of latest news, as shown in Figure 2.



RAINBOW NEWS

Figure 2: Landing page intro & news section

ii) The section ***"The Project"*** gives information about the Concept and the Objectives of the project (Figure 3), the partners involved in RAINBOW (Figure 4), the Project Advisory Board and the Project Management Structure.

Figure 3: Concept and Objectives

Figure 4: The Consortium

iii) **<u>RAINBOW Platform</u>**. Provides useful information about the platform of the project, as shown in Figure 5. In this section, major changes took place lately.

RAINBOW is a novel platform that **simplifies the deployment and management of scalable, heterogeneous and secure IoT services**. RAINBOW's fog computing platform provides deployment, orchestration, network fabric and data management services for scalable and secure edge applications, addressing the need to timely process the ever-increasing amount of data continuously gathered from heterogeneous IoT devices and appliances.

RAINBOW provides users with: (i) an intuitive **Dashboard and DevOps toolset** enabling the description of application topologies and QoS requirements, (ii) a **Fog Middleware** with horizontal and vertical services for IoT orchestration, continuous service placement and management, adaptive monitoring, trust establishment and runtime verification and decentralized analytics; (iii) a **Trusted Overlay Mesh Network** as the control plane that efficiently abstracts the complexity of enforcing security and privacy crypto-primitives among fog services; and (iv) a **Sidecar Proxy** providing an execution environment embedded alongside service instances able to properly and efficiently manage both fog node resources and high volumes of data, which can be collected, stored, and analyzed in place to derive analytics. This approach provides **IoT service operators with the opportunity to solely focus on their services business logic**, leaving to RAINBOW the burden of *how* and *where* services must be placed, establishing secure collaboration among services and dealing with low-level aspects in data analysis including heterogeneous resource management, mobility and reducing data movement.

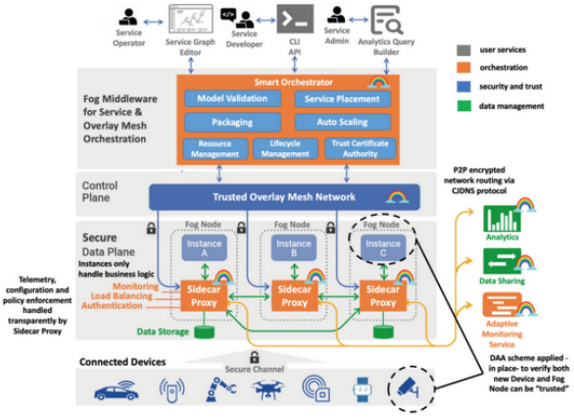


Figure 5: RAINBOW Platform

There are now more details about the Rainbow Platform relating to the project's ***Motivation*** (Figure 6), to provide useful answers in critical questions such as:
What is the problem that the project is solving? Why a novel fog computing platform, such as the one offered by RAINBOW, is needed?

RAINBOW aspires to address the need to timely process the ever-increasing amount of data continuously gathered from heterogeneous IoT devices and appliances and enable fog computing to reach its true potential by providing the following services tailored-made to support scalable and secure edge applications:

1 DEPLOYMENT
2 SECURITY
3 ORCHESTRATION
4 NETWORK FABRIC
5 DATA MANAGEMENT & ANALYTICS

Our solution will provide significant benefits for popular cloud platforms, fog middleware, and distributed data management engines, and will extend the open-source ecosystem by pushing intelligence to the network edge while also ensuring security and privacy primitives across the device-fog-cloud-application stack.

RAINBOW provides a set of innovative mechanisms and middleware tools for IoT orchestration, data collection and **decentralized analytics** that guarantees network security, data protection, identity management and resource integrity. The key characteristic of the middleware will be the embedded intelligence and remote attestation mechanisms for establishing trust and QoS requirements while coping with performance and network uncertainties.

RAINBOW aspires to develop a **fog orchestration framework** on top of popular cloud management stacks by rethinking the current de-centralized computing and network algorithms for rapid resource provisioning, monitoring and seamless management of IoT services and cross-cloud applications. The framework will support affinity-aware and multi-objective offloading, enabling the execution of IoT services partitioned into segments (i.e., microservices) on different and heterogeneous fog and edge devices. The algorithmic process of determining where IoT services, and their partitioned segments must run, will be based on user defined **QoS**, **energy**, **network dynamics** and **cost optimization constraints**.

RAINBOW will additionally embrace low-cost approximate and adaptive monitoring techniques to dynamically adjust the processing and data dissemination rate of IoT services, allowing edge devices to reduce energy consumption and ease the pressure on fog networks. RAINBOW will also support offline operation of IoT services and edge devices, enabling them to maintain execution of scheduled or responsive operations in the local environment despite having lost connection.

RAINBOW will enable the distribution of intelligence within overlay mesh networks **so that data does not have to leave the network logical boundaries for fog service analytics**. This will allow IoT services to maintain offline intelligence in order to reduce communication overheads and cope with network uncertainties. Addressing these challenges will allow analytic jobs to run low-power, mobile, and geodistributed infrastructure for the creation of insights on top of raw data produced and stored across the overlay mesh network. In turn, RAINBOW will provide rich and declarative query abstractions decoupled from the underlying infrastructure and distributed processing engine.

RAINBOW will enable IoT service operators to

Figure 6: RAINBOW Platform Motivation

Also, more useful details added about the project's ***Open Challenges***, in order to provide answers in critical questions such as:
What is missing from currently available technologies & solutions? What technological challenges are there?
Figure 7 is a screenshot of RAINBOW Platform Open Challenges section.

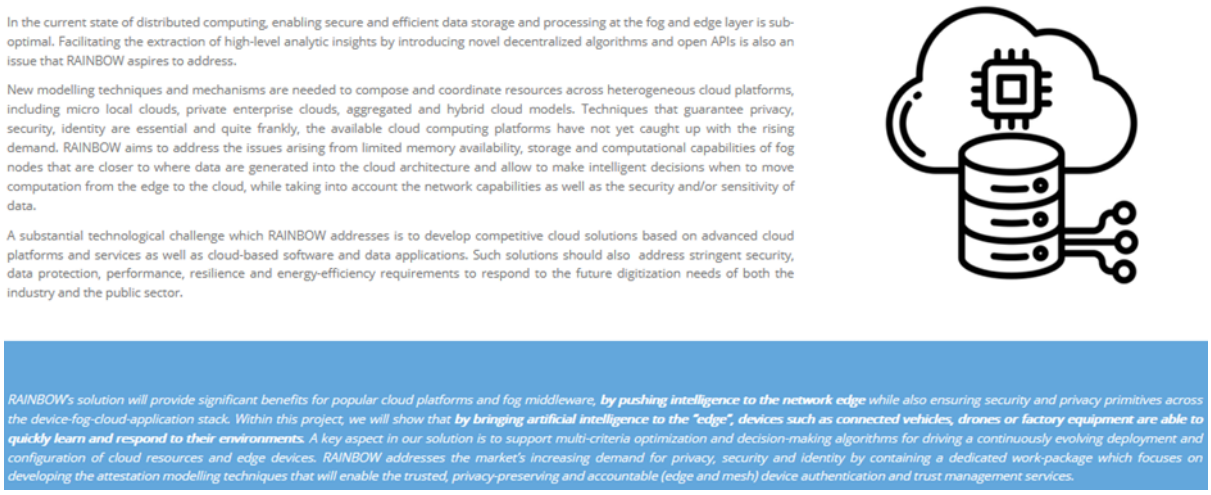


Figure 7: RAINBOW Platform Open Challenges

In the sub-section ***Mission & Vision*** (Figure 8), there is relevant information to enlighten the visitor in terms of:
What is RAINBOW's novel offering? How will it answer the identified challenges?

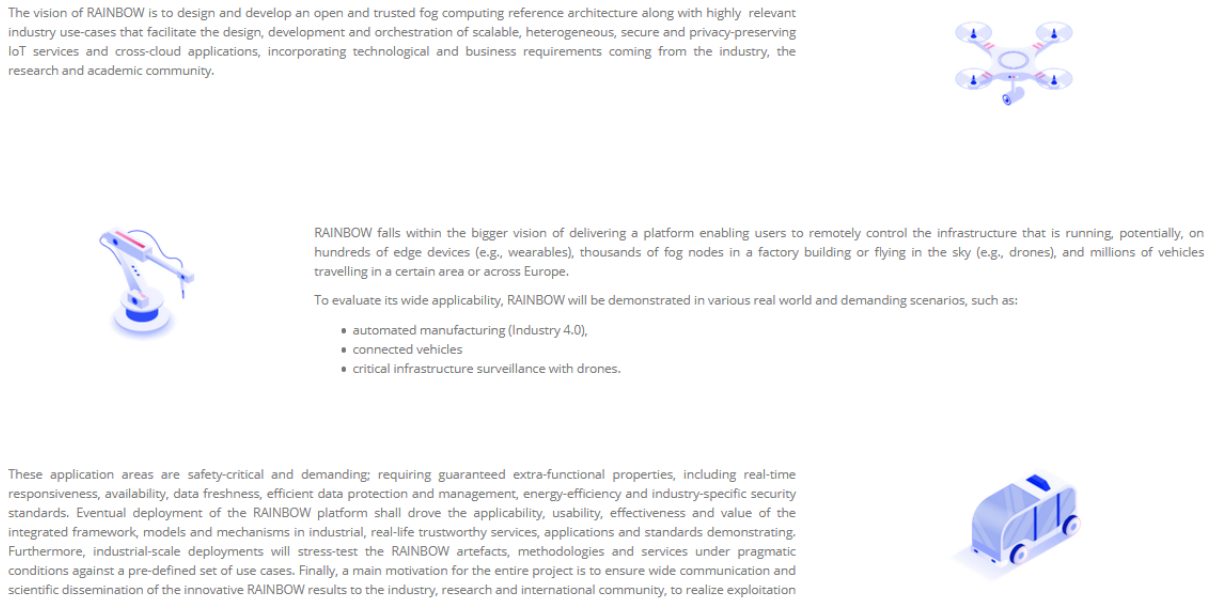


Figure 8: RAINBOW Platform Mission & Vision

The sub-section of RAINBOW's ***Impact*** modified on a way that will provide appropriate answers on questions such as:
What kind of impact do we foresee for RAINBOW? What kind of stakeholder groups will it affect?
Figure 9 is a screenshot of RAINBOW Platform Impact section.

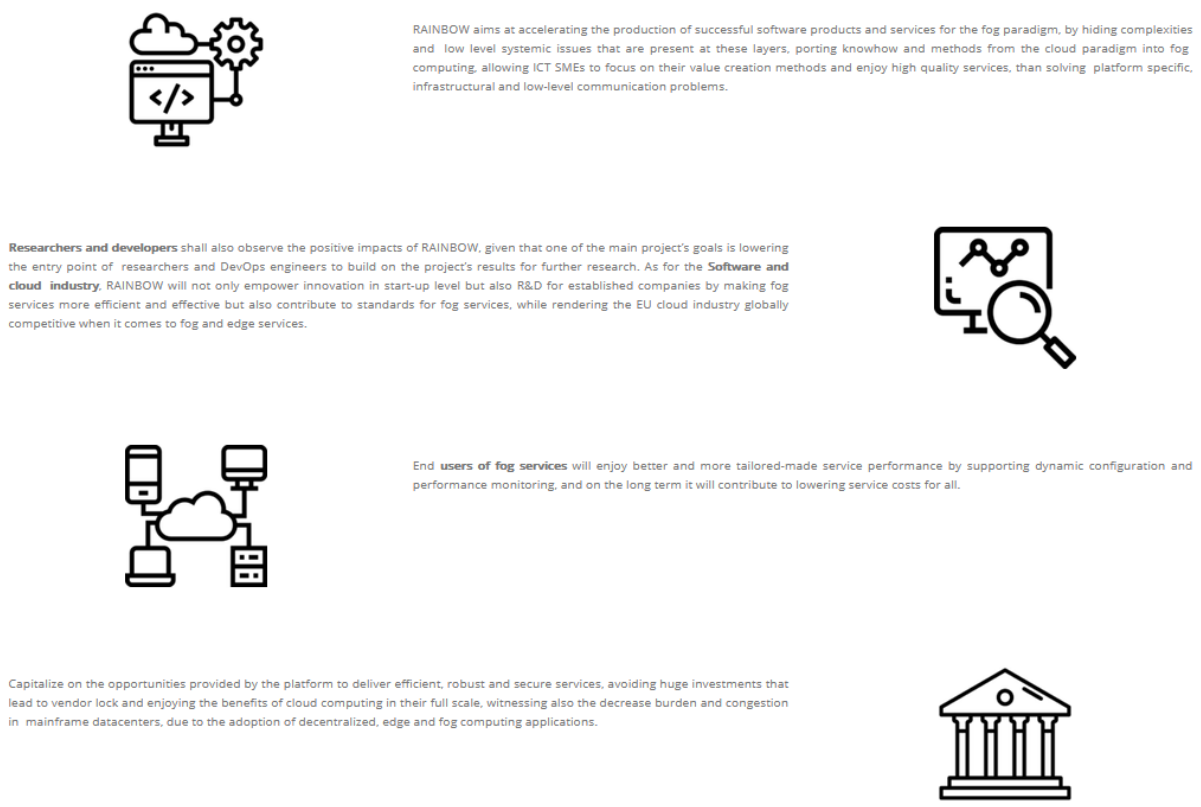


Figure 9: RAINBOW Platform Impact

iv) **<u>Use Cases</u>**. Contains details about the 3 Use Case scenarios. RAINBOW Use Cases section is illustrated in Figures 10-12.

Use Case 1

Human-Robot Collaboration in Industrial Ecosystems

Indoor positioning for safety-critical industrial IoT requires the propagation of telemetry, positioning and trajectory data at millisecond range from hundreds of thousands of objects, human workers and robotic machinery. Effectively monitoring these entities requires numerous sensors. At the same time, it requires the execution of complex probabilistic AI algorithmic models on 3D-spacing topologies to output coordination plans, continuously assess and prevent collisions among objects, robotic machinery and workers for specific factory sections and assembly lines. Because of the delay-sensitive nature of these tasks, propagating acquired positioning data to centrally accessible private cloud infrastructure, results in cycles, where often due to either unanticipated load and model processing, the outputted safety distances, coordination assessment and planning are derived too late. These challenges require processing positioning data and performing analysis directly on or near the sensing entities to guarantee faster and deterministic reaction.

Figure 10: Use Case 1, Human-Robot Collaboration in Industrial Ecosystems

Use Case 2

Digital Transformation of Urban Mobility

The goal of this use-case is to create a real-time geo-referenced notification system for vehicles traveling in urban areas about critical situations for the city mobility network, due to any possible cause (e.g., severe weather, failure of road infrastructure, huge congestion). The main challenges are: (i) the identification of a secure, anonymized and reliable virtualized "subject" who will be in charge of reporting and updating local information (validation, dispatch to users); (ii) study of strategies for the optimal splitting of functions between the on-board application, the edge and the cloud backend and for their dynamic configuration; (iii) the identification of the geographical location of MEC servers to support different user populations and densities, tailoring the service to the peculiarities of the covered area; (iv) the primary support of the emerging C-V2X PC5 wireless technology, but with the possibility of being suitable for any target V2V-V2I communication solution. The main innovation brought by the use case is to turn mobility actors in "prosumers", i.e. producers and consumers of mobility data, creating virtual local dynamic communities. The core is the adoption of bilateral exchange mechanisms and real-time "service availability" for "people on the move".

Figure 11: Use Case 2, Digital Transformation of Urban Mobility

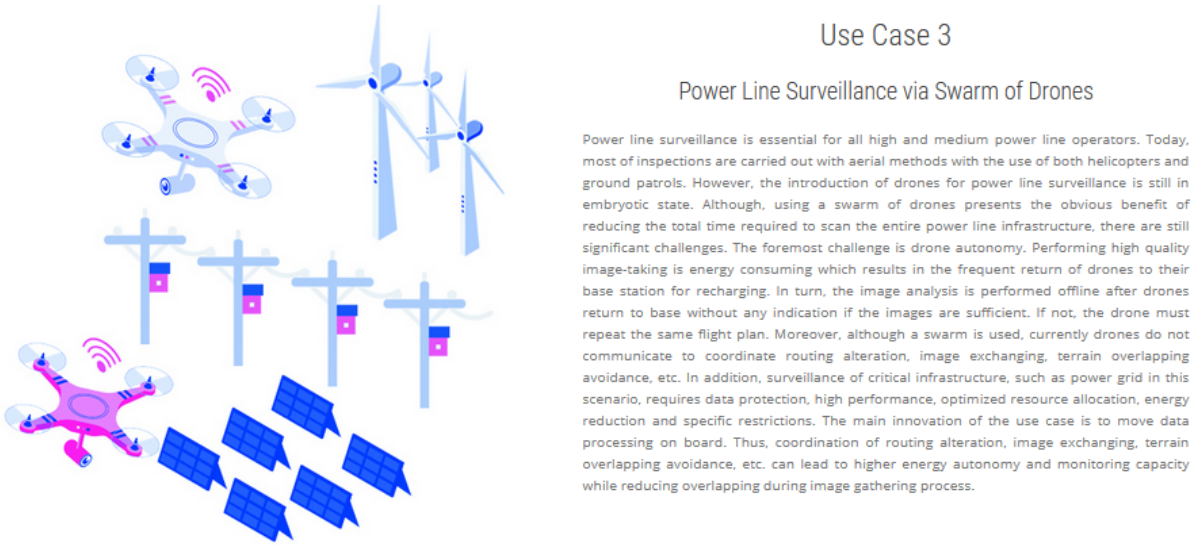


Figure 12: Use Case 3, Power Line Surveillance via Swarm of Drones

v) **Resources**. The content in this section includes information regarding Public Deliverables (Figure 13), Publications (Figure 14), Promo Materials (brochure, flyer) and e-Newsletters. There will be further analysis of Promo Material and e-Newsletters in a later chapter.

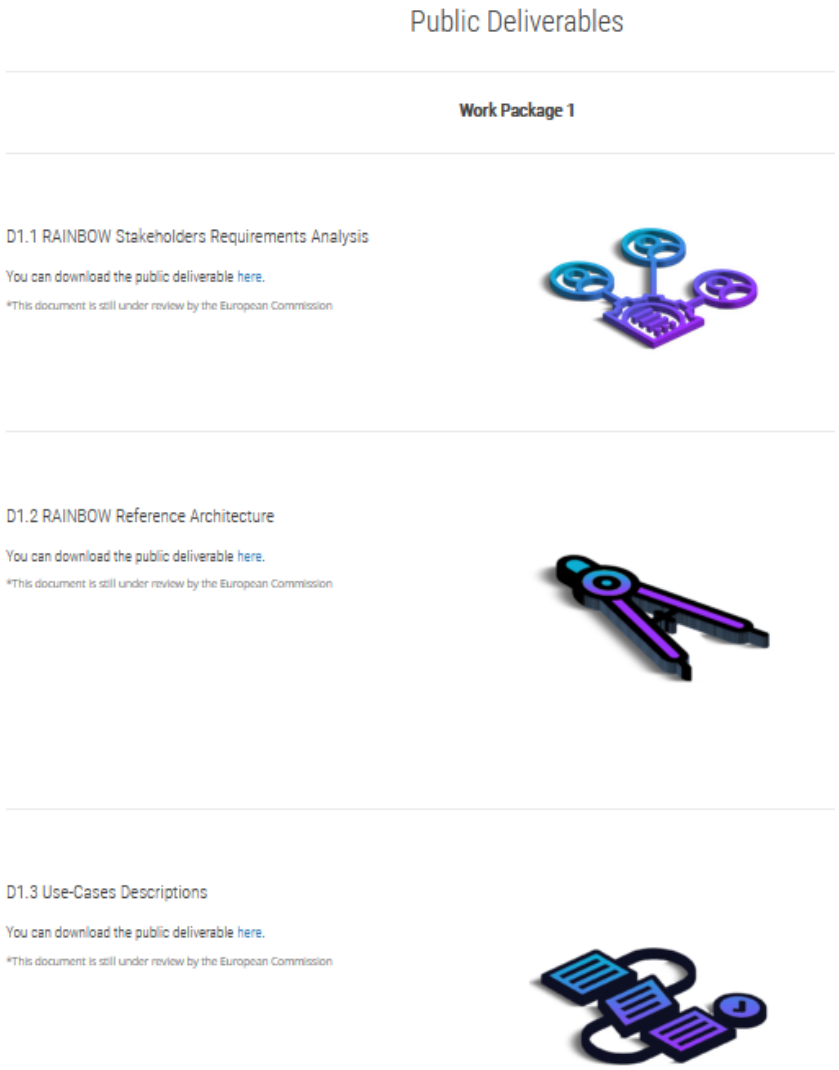


Figure 13: Public Deliverables

Publications

Published by UCY

1. M. Symeonides, Z. Georgiou, D. Trihinas, G. Pallis and M. D. Dikaiakos, "Demo: Emulating Geo-Distributed Fog Services," *2020 IEEE/ACM Symposium on Edge Computing (SEC)*, 2020, pp. 187-189, DOI: 10.1109/SEC50012.2020.00031
2. M. Symeonides, Z. Georgiou, D. Trihinas, G. Pallis and M. D. Dikaiakos, "Fogify: A Fog Computing Emulation Framework," *2020 IEEE/ACM Symposium on Edge Computing (SEC)*, 2020, pp. 42-54, DOI: 10.1109/SEC50012.2020.00011
3. Z. Georgiou, C. Georgiou, G. Pallis, E. M. Schiller and D. Trihinas, "A Self-stabilizing Control Plane for Fog Ecosystems," *2020 IEEE/ACM 13th International Conference on Utility and Cloud Computing (UCC)*, 2020, pp. 13-22, DOI: 10.1109/UCC48980.2020.00021

Published by DTU

1. Larsen B., Debes H.B., Giannetsos T. (2020) "CloudVaults: Integrating Trust Extensions into System Integrity Verification for Cloud-Based Environments". In: Boureanu I. et al. (eds) Computer Security. ESORICS 2020. Lecture Notes in Computer Science, vol 12580. Springer, Cham. DOI: 10.1007/978-3-030-66504-3_12

Published by AUTH

1. Theodoros Toliopoulos, Christos Bellas, Anastasios Gounaris, and Apostolos Papadopoulos. 2020. "PROUD: PaRallel OUtlier Detection for Streams". In Proceedings of the 2020 ACM SIGMOD International Conference on Management of Data (SIGMOD '20). Association for Computing Machinery, New York, NY, USA, 2717–2720. DOI: 10.1145/3318464.3384688

Published by BIBA

1. Karthik Shenoy Panambur, Shantanoo Desai, Amit Kumar Singh, Klaus-Dieter Thoben, "A Hybrid Approach for Digital Representation of Sensors in Real-Time Applications", Procedia Manufacturing, Volume 52, 2020, Pages 14-19, ISSN 2351-9789, DOI: 10.1016/j.promfg.2020.11.004

Published by POLITO

1. A. Abdellatif, C. F. Chiasserini, F. Malandrino, A. Mohamed and A. Erbad, "Active Learning With Noisy Labelers for Improving Classification Accuracy of Connected Vehicles," in IEEE Transactions on Vehicular Technology, vol. 70, no. 4, pp. 3059-3070, April 2021, DOI: 10.1109/TVT.2021.3066210
2. F. Malandrino, C. F. Chiasserini and G. M. Dell'Aera, "Edge-powered Assisted Driving For Connected Cars," in IEEE Transactions on Mobile Computing, DOI: 10.1109/TMC.2021.3084291
3. Larsen B., Debes H.B., Giannetsos T. (2020) "CloudVaults: Integrating Trust Extensions into System Integrity Verification for Cloud-Based Environments". In: Boureanu I. et al. (eds) Computer Security. ESORICS 2020. Lecture Notes in Computer Science, vol 12580. Springer, Cham. DOI: 10.1007/978-3-030-66504-3_12

Figure 14: Publications

vi) **Clustering**. This section contains affiliated projects with RAINBOW such as PLEDGER, MORPHEMIC, DataVaults, Glass. Moreover, there is information about initiatives in which RAINBOW is a member, along with other cloud projects: HORIZON CLOUD and Future Cloud. Figure 15 is a screenshot of RAINBOW Clustering.

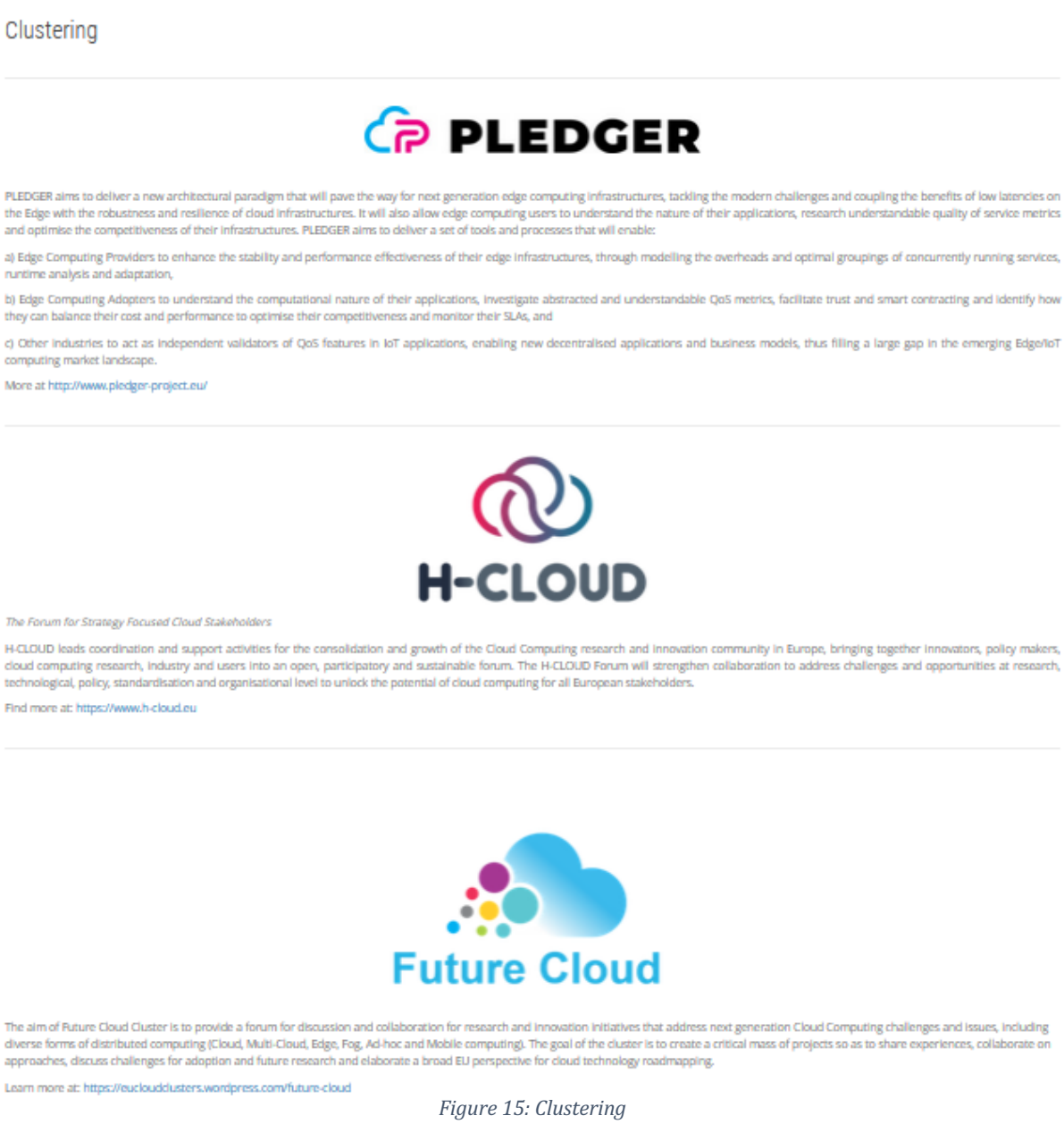


Figure 15: Clustering

vii) Blog/News. This section contains news, articles and information about the events which RAINBOW is organising or attending, as well as online version of the communication material. Furthermore, this section presents blog articles on specific topics within RAINBOW. More report about this section can be found in Chapter 5.

viii) Members area. Here is the project's repository where all the files related to the activities of the project are stored.

ix) Contact area. The visitor of the website can send a message through this section and furthermore by providing his/her email can subscribe to the newsletter. Beyond the newsletter, subscribers will be updated with other material and updates about the project. In addition, the visitors can take a look at the privacy policy details.

3.1.2 Website Sections Under Development

Website designers created a JavaScript code which allows visitors to hover over each architecture component, on the blue spot, and explore more details, including documentation links, video tutorials, etc. Figure 16 illustrates the sub section *"Platform Release"* in the **RAINBOW Platform** section:

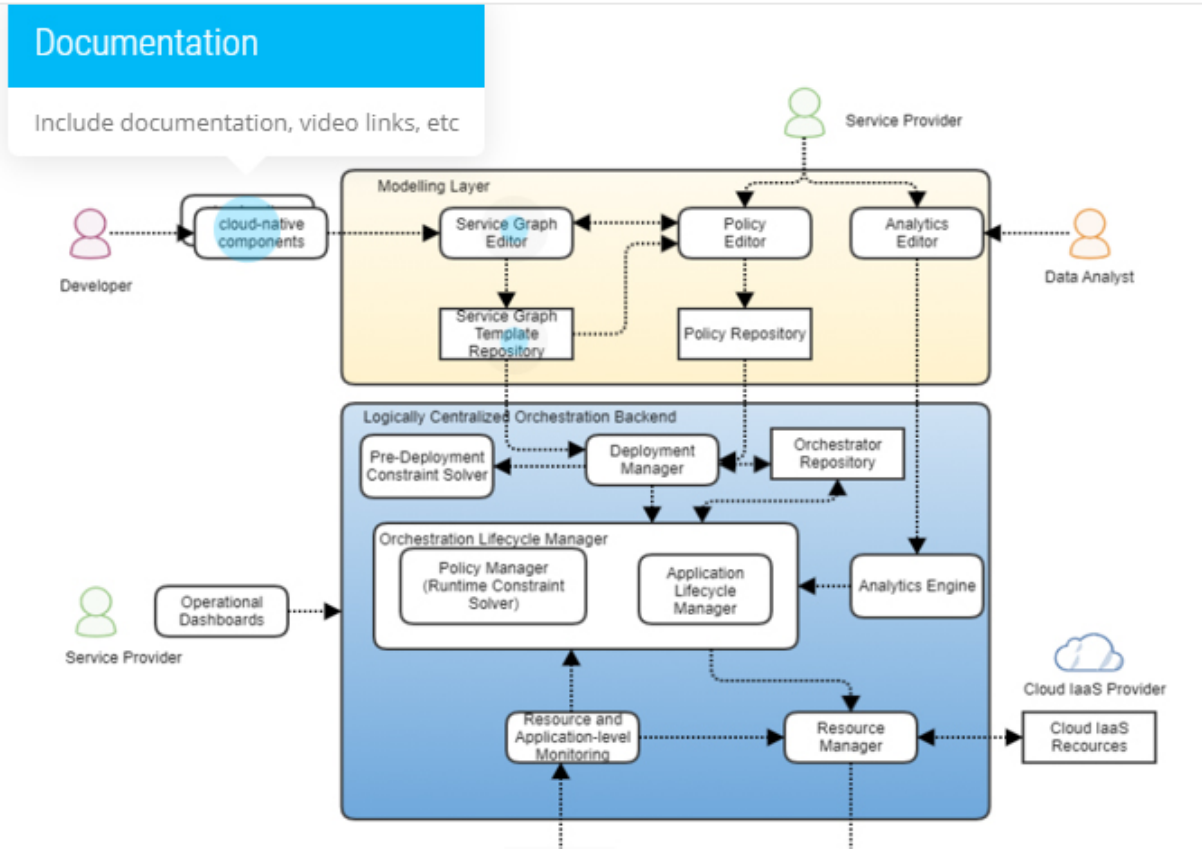


Figure 16: RAINBOW Platform Release documentation

Figure 17 is a screenshot of another proposed variant:

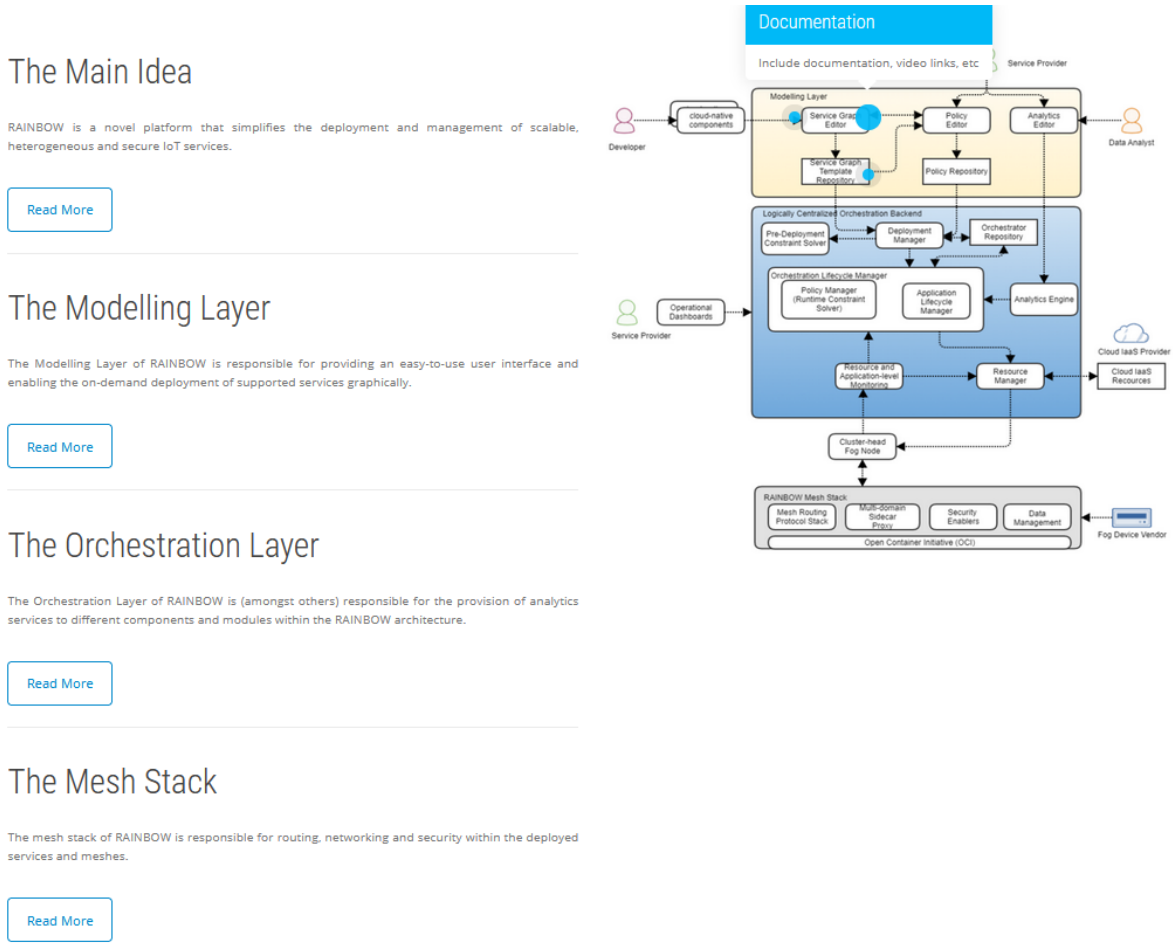


Figure 17: RAINBOW Platform release documentation v.2

The sub section "*Platform Release*" can be linked also from the landing page. A related new entry to the slider can be easily added like the one in the following figure:

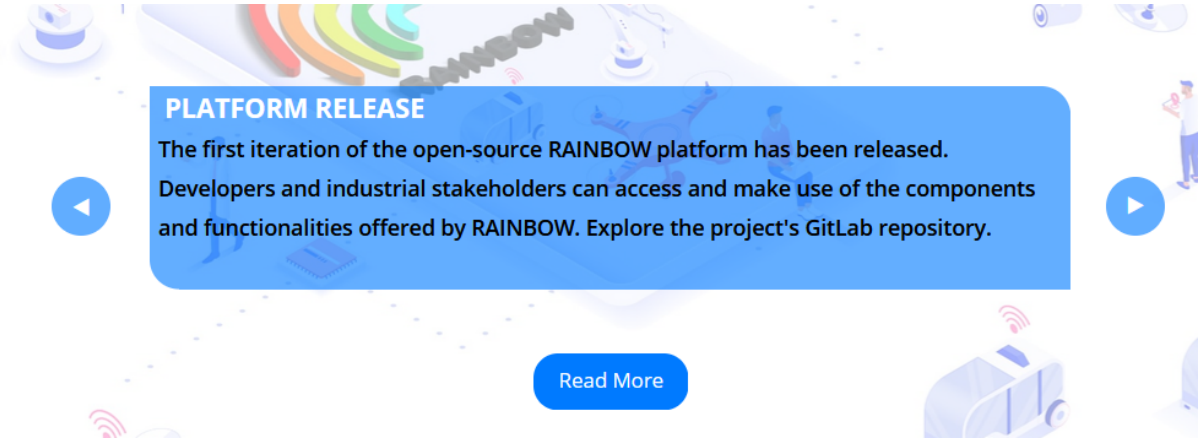


Figure 18: Platform Release Slider

3.2 Search Engine Optimization

"On-site" actions regarding SEO are completed since (M11). Each page of the website includes:

- Focus Key-phrases
  - Rainbow project h2020
  - Edge Computing
  - Fog Computing
  - Cloud Computing
  - Microservices
- SEO Title
- SEO permalink
- Unique Meta Description

A keyword research was made to identify: "*what are the keywords that a user types on Google's search engine*", in order to find services which are similar to the services RAINBOW provides. The report of the keyword analysis includes some insights (Average Monthly Searches, CPC estimation, etc.) for 50 RAINBOW-related keywords and can be found on the following link:
https://docs.google.com/spreadsheets/d/1z4vq8ABgcmhdBXbsT70nLiK73JpXtzbq4Ses18h4R3E/edit?usp=sharing

Besides the keywords which are related to RAINBOW's services, some keywords used, which are related with the project name. Table 3 presents the top 6 keywords.

Keyword	Avg. monthly searches
microservices	**18100**
edge computing	**14800**
fog computing	**2400**
iot platform	**1600**
distributed computing	**1300**
java microservice	**1000**

Table 3: Google Advertising Top Keywords

Based on this keywords research SEO friendliness optimized on every page of the project website, by adding the following elements:

a. *SEO Friendly Title*

b. *SEO Friendly Slug*
c. *SEO Friendly Meta Description*
d. *SEO Friendly Focus Keyphrase*

The on-site search engine optimization took place on September 2020. Table 4 presents the values of each element per page.

Page	Title	Slug	Meta Description	Focus Keywords
Landing Page	RAINBOW Project h2020 - A Fog Computing Platform	https://rainbow-h2020.eu/	The vision of RAINBOW project is to design and develop a fog computing platform that facilitates the deployment of IoT services and cloud apps	Rainbow project h2020
Advisory Board	RAINBOW Project h2020 - Advisory Board	https://rainbow-h2020.eu/advisory-board/	The main roles and instruments comprising the RAINBOW project management structure include: General Assembly, Technical Committee etc.	Rainbow project Advisory Board
Blog	RAINBOW Project h2020 - Blog	https://rainbow-h2020.eu/blog/	In RAINBOW blog page you will see the latest news of the project, interesting material regarding fog, edge computing and microservices	Rainbow project Blog
Clustering	RAINBOW Project h2020 - A Fog Computing Platform	https://rainbow-h2020.eu/clustering/	Check RAINBOW Project's publication regarding state of the art concepts in	RAINBOW Project h2020

Page	Title	Slug	Meta Description	Focus Keywords
			edge/fog computing, microservices and cloud computing.	
Concept and Objectives	RAINBOW Project h2020 -Concept and Objectives	https://rainbow-h2020.eu/concept-and-objectives/	The RAINBOW Vision and Key Technological Aspects as well as the RAINBOW Objectives.	RAINBOW project Objective
Newsletters	RAINBOW Project h2020 - Newsletters	https://rainbow-h2020.eu/newsletters/	Check RAINBOW Project h2020 updated newsletter	RAINBOW Project Newsletter
Promo Materials	RAINBOW Project h2020 -Promo Materials	https://rainbow-h2020.eu/promo-materials/	See RAINBOW Project's promo material, including a 4 page brochure and an A3 poster for project dissemination.	RAINBOW Project Brochure
Rainbow Platform	RAINBOW Project h2020 - Rainbow Platform	https://rainbow-h2020.eu/rainbow-platform/	RAINBOW is a novel platform that simplifies the deployment and management of scalable, heterogeneous and secure IoT services.	Rainbow Platform
RAINBOW Team	RAINBOW Project h2020 - The Consortium	https://rainbow-h2020.eu/the-team/	Meet RAINBOW Project consortium which comprises of innovative companies and small-medium enterprises.	RAINBOW Project consortium

Table 4: On-Site Search Engine Optimization

Moreover, efforts initiated, regarding external search engine optimization by triggering consortium members and clustering projects, to create direct links to the project website so as to increase the number of backlinks, using Dofollow links. After a number of weeks, some early tests conducted in order to verify that these actions helped RAINBOW website "climb" in Google's first page results. Today, RAINBOW's website comes first in several

searches. Some images attached to prove this statement. All the following searches have been executed using Google Chrome in Incognito Mode.

When the search term is *"rainbow project"*, RAINBOW website appears 6th in the first page results:

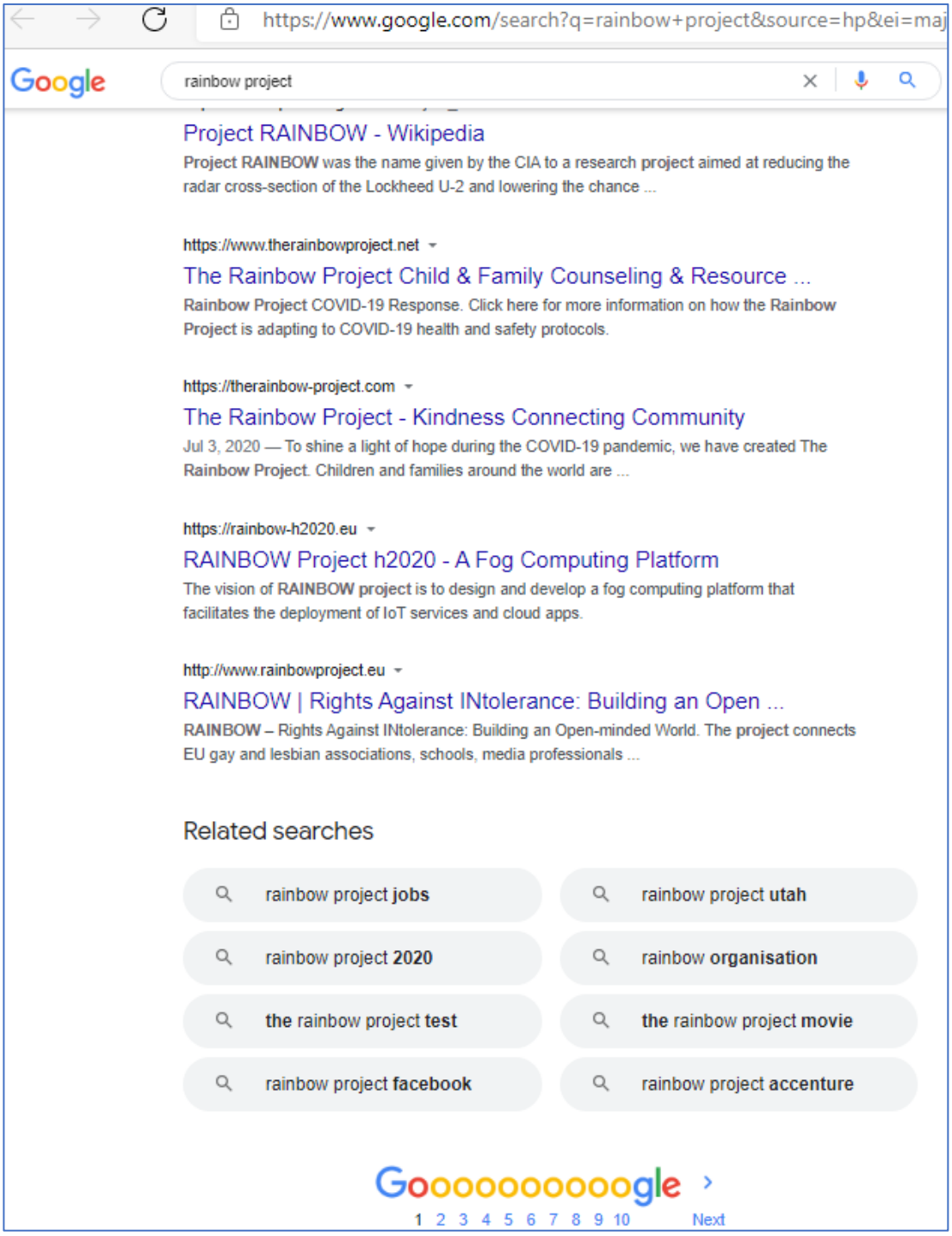


Figure 19: Search term "rainbow project"

When the search term is *"rainbow horizon project"*, RAINBOW website appears 1st in the first page results:

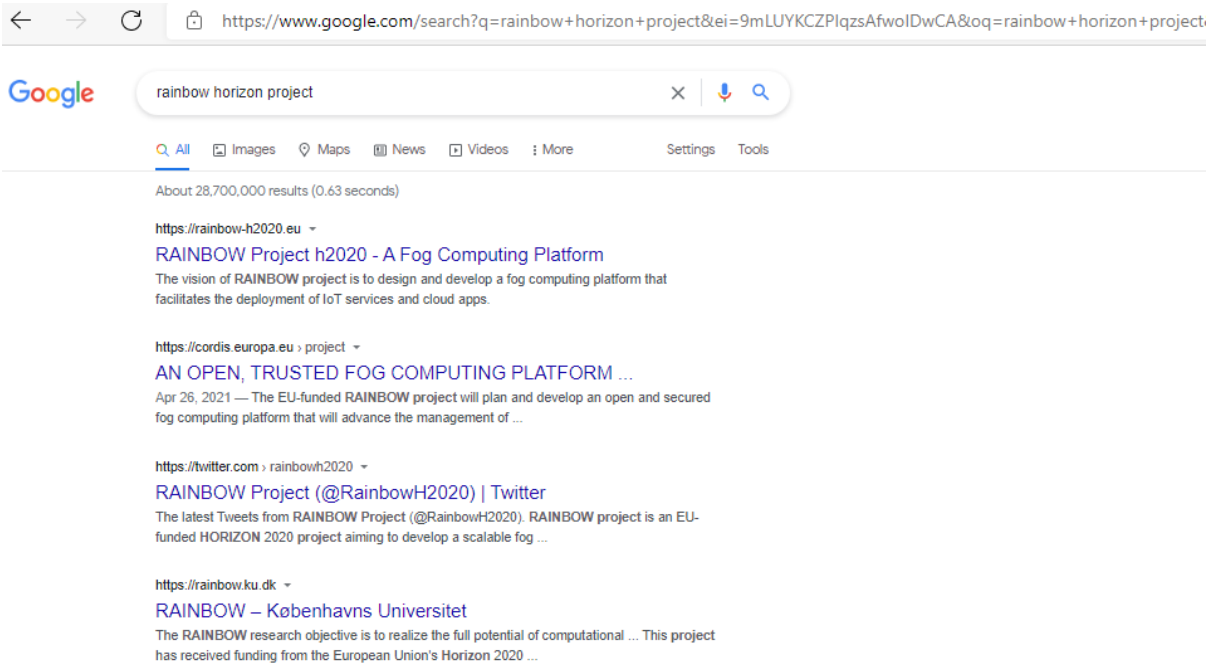


Figure 20: Search term "rainbow horizon project"

When the search term is *"rainbow fog computing"*, RAINBOW website appears 1st in the first page results:

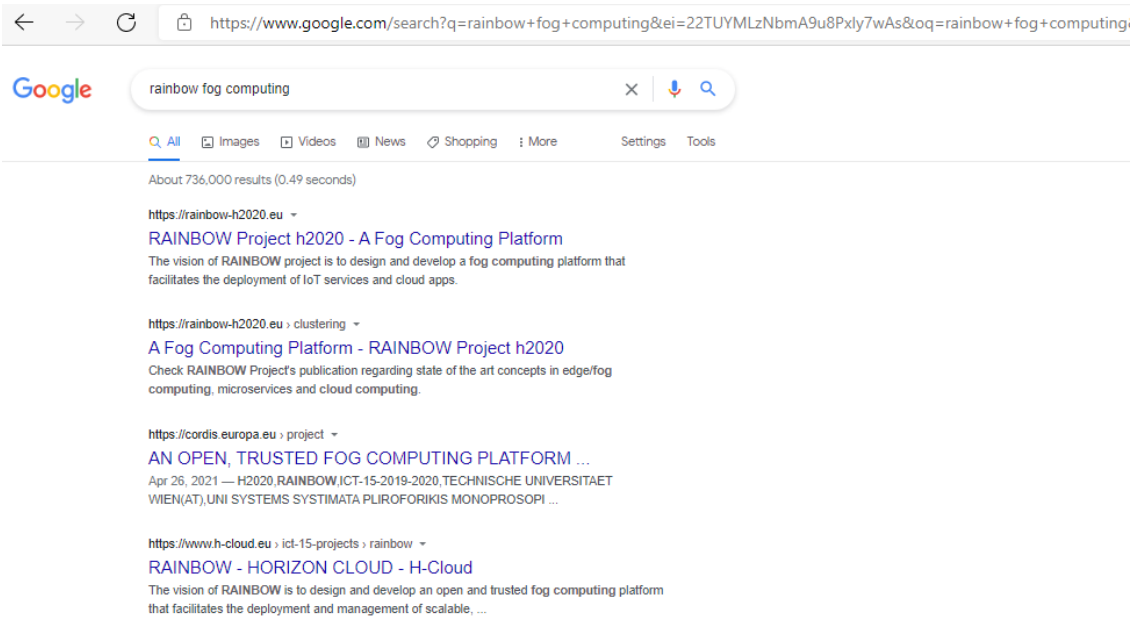


Figure 21: Search term "rainbow fog computing"

When the search term is *"rainbow edge computing"*, RAINBOW website appears 1st in the first page results:

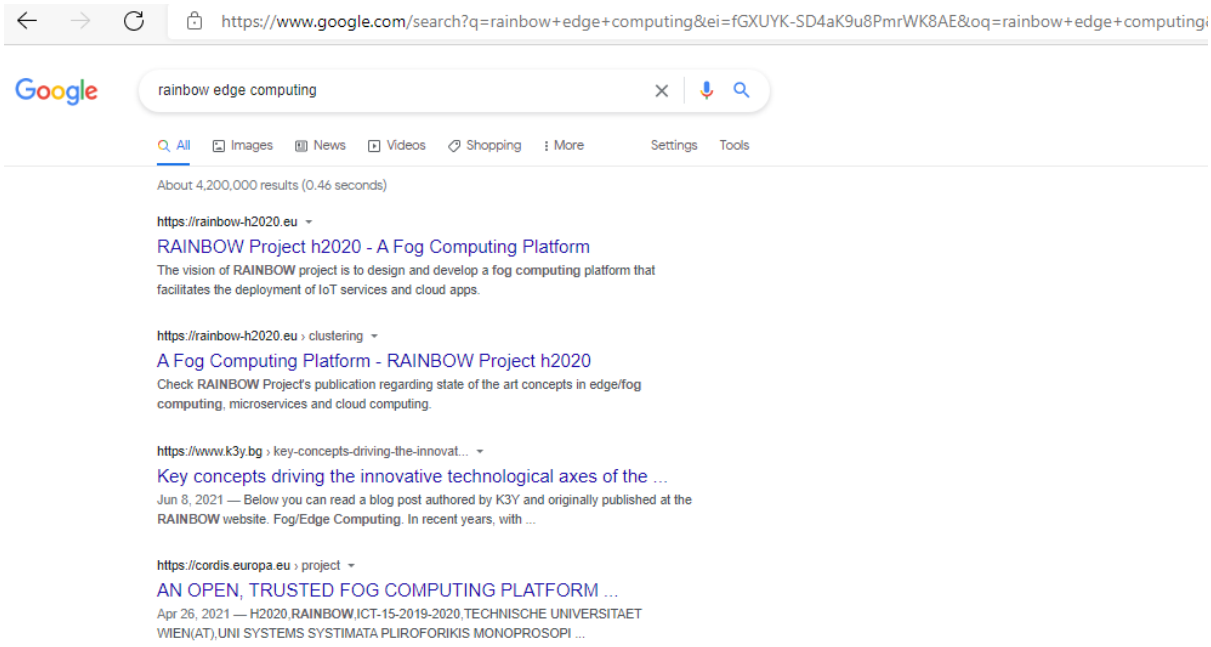


Figure 22: Search term "rainbow edge computing"

When the search term is *"rainbow microservices"*, RAINBOW website appears 3rd in the first page results:

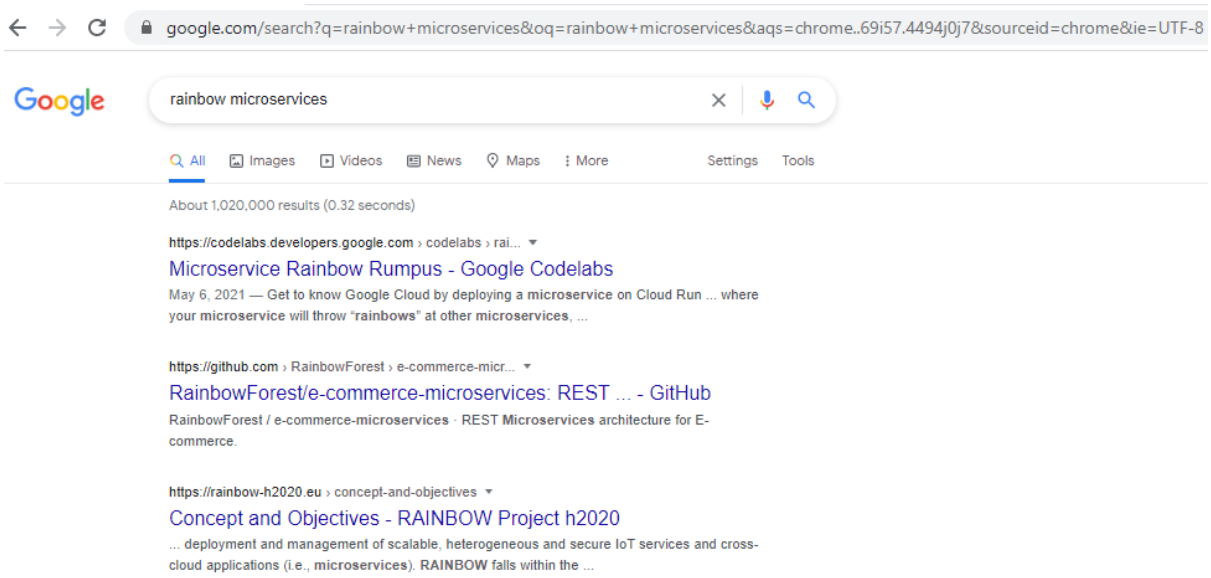


Figure 23: Search term "rainbow microservices"

It is worth mentioning that RAINBOW website will not be displayed in Google's search engine results, for single-word or abstract searches like "*rainbow, horizon, microservices, fog-computing*" since these terms and phrases are too generic. There are however keywords that we are interested in, such as: *fog computing solutions, edge computing solutions, fog computing platform, edge computing platform, develop iot applications* etc., but the website is not included in Google's first results. In order to gain the visibility needed for this type of keywords, there is a plan ready, concerning digital campaigns which includes paid advertising in Google and Facebook.

3.3 Data Analytics

After the launch of the website, a Google Analytics account was created to keep track of the metrics related to the interaction of user visitors to the website.

KPIs C1	Target	RP1 Status
Number of unique visitors	**5000**	**2,092**
Average duration of visits	**2 min**	**02:29**
Number of page views	**10000**	**9,424**

Table 5: CM1 Project's Website KPIs, Targets and Current status

Figure 24 highlights some of the statistics of the website for the first half of the project. From M3 until M18, the RAINBOW website has been visited 9,424 times by 2,092 unique users who, on average, spend 2 minutes 29 seconds in RAINBOW website. These numbers are in line with the foreseen KPIs, as shown in Table 5.

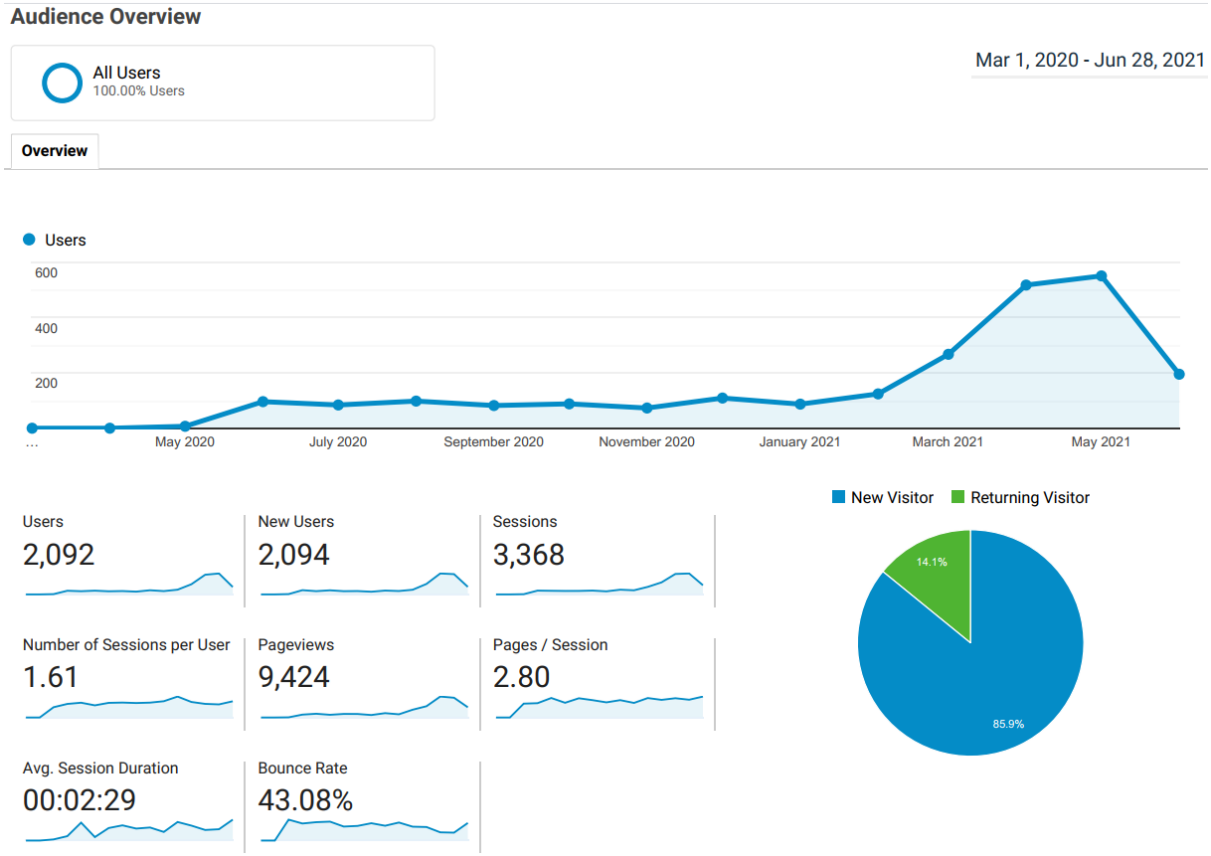
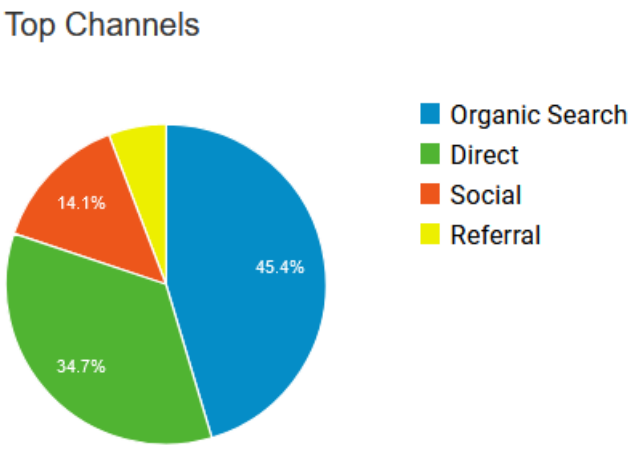


Figure 24: RAINBOW Website Statistics Overview

The average user of the website sees 2,8 pages in each session which is satisfactory as the visitors don't remain in one page. The overall bounce rate (the percentage of visitors to a particular website who navigate away from the site after viewing only one page) is 43.08%, which is generally a roughly average number.

Most of the RAINBOW website visitors are new (85.9%) which has a two-fold meaning. On the one hand, it means that a wider audience has been interested in RAINBOW, and many new potential stakeholders visit the website, which indicates a wide reach-out of RAINBOW. In addition, it is not uncommon for one-product websites not to get many returning visitors: once the product has been used or purchased, the user does not need to come back to the website. On the other hand, it also implies that many of potentially interested stakeholders have not come back to the website to get further updates.

With the first release version of the RAINBOW platform being expected by the end of M18, on line advertisement campaigns will be launched, so the website visit duration and all numbers regarding website statistics shall improve.

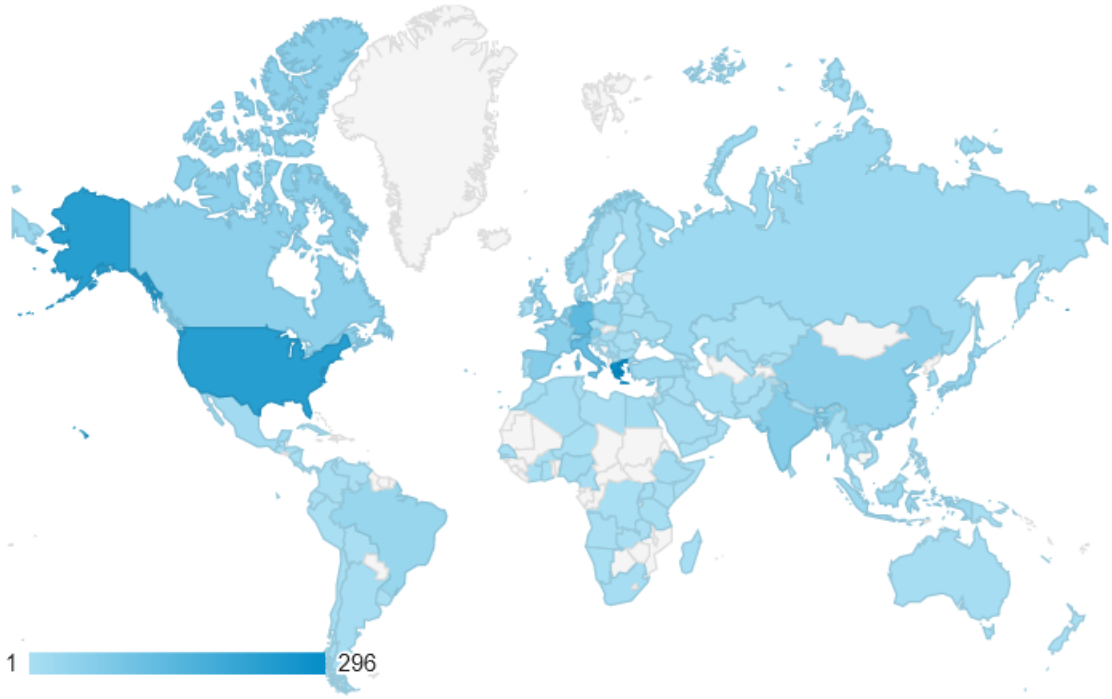


	Acquisition			Behavior		
	Users ↓	New Users	Sessions	Bounce Rate	Pages / Session	Avg. Session Duration
	2,050	2,052	3,288	42.76%	2.79	00:02:26
1 Organic Search	954			27.89%		
2 Direct	713			52.95%		
3 Social	314			54.46%		
4 Referral	144			48.58%		

Figure 25: RAINBOW website acquisition overview

Figure 25 is a screenshot from the **Acquisition overview** menu and provides a summary of the channel sources of our visitors. The majority of our visitors (45.4%) reached the website by *"Organic Search"*, meaning that they found our website through search engines. The second source of generated traffic comes directly from visitors that type the website URL or click their bookmark (*"Direct-34.7%"),* while the third source of incoming visitors is clicks of the website link from social media (14.1%) and third-party websites (*"Referral-5.8%").* The fact that the organic search precedes other sources indicates the efficiency of the website's Search Engine Optimisation (SEO) that has been deployed.

Figure 26 presents information about the number of users per country, during the considered period. Those are the users who have initiated at least one session during the date range. There are many visitors originating from a variety of countries and continents, such as Greece, United States, Germany, India, China, France, etc.



Country	Acquisition		
	Users	New Users	Sessions
	2,092 % of Total: 100.00% (2,092)	2,098 % of Total: 100.19% (2,094)	3,368 % of Total: 100.00% (3,368)
1. Greece	**296** (14.04%)	297 (14.16%)	935 (27.76%)
2. United States	**236** (11.20%)	233 (11.11%)	264 (7.84%)
3. Germany	**139** (6.59%)	133 (6.34%)	183 (5.43%)
4. Italy	**122** (5.79%)	121 (5.77%)	227 (6.74%)
5. Austria	**76** (3.61%)	76 (3.62%)	165 (4.90%)
6. Cyprus	**70** (3.32%)	69 (3.29%)	192 (5.70%)
7. Spain	**68** (3.23%)	68 (3.24%)	82 (2.43%)
8. India	**67** (3.18%)	66 (3.15%)	81 (2.40%)
9. France	**59** (2.80%)	59 (2.81%)	74 (2.20%)
10. China	**57** (2.70%)	57 (2.72%)	67 (1.99%)

Figure 26: RAINBOW Website Statistics Overview

4 RAINBOW Social Media Presence

Nowadays social media networks are perhaps the most popular and efficient channels to promote a project and enhance its visibility. Through the use of social networks channels and media it is possible to increase the visibility of RAINBOW and create room for exchange of experiences and knowledge between professionals and stakeholders.
RAINBOW's social media presence during the first half of the project includes LinkedIn, Twitter and Facebook:

- *Updates on the news and progress of the project are published at regular time intervals.*
- *Furthermore, notable studies and articles on topics related to the project.*
- *Also, news related to collaborating projects, events and activities of interest, etc.*

New social media channels created during M14 to M17, in order to contribute to the digital communication presence of RAINBOW: Instagram, ResearchGate and YouTube.

All involved partners in the RAINBOW project are committed to use their own organization and individual social networks for promoting the project results and allow reaching a wide audience in order to increase impact and succeed a broad communication of project outputs.

KPIs C2	Target	Current status
Number of accumulative followers	**750**	**393**
Number of accumulative posts	**1,000**	**205**
Number of interactions	**250**	**>250**

Table 6: CM2 RAINBOW Social Media Presence, Targets and Current Status

Related to current status of KPIs Targets of Communication Mechanism 2 (Table 6), for all active social media channels, the number of accumulative followers in total is 393. The number of accumulative posts is 205. In order to reach the target of 1,000 at the end of the project, the general direction is to step up the number of published posts each week. Since M14, the accumulative posts from 48 reached the number of 205. The number of interactions *(like, share, comment, retweet, tag)* are already more than the target of 250.
It is important to mention that many of the social media posts also link to RAINBOW's website in order to increase traffic and attention there.
Also, in each post on social media, the following hashtags are listed: *#RAINBOW H2020 #EdgeComputing #FogComputing #Industry40 #secureIoT* in order to increase our reach.

4.1 LinkedIn

As of M3, the RAINBOW LinkedIn page (https://www.linkedin.com/company/rainbow-project-h2020) has got 158 followers as illustrated in the next figure. LinkedIn provides an analytics functionality, that gives a deeper insight of user activities and the impact that posts have to followers.

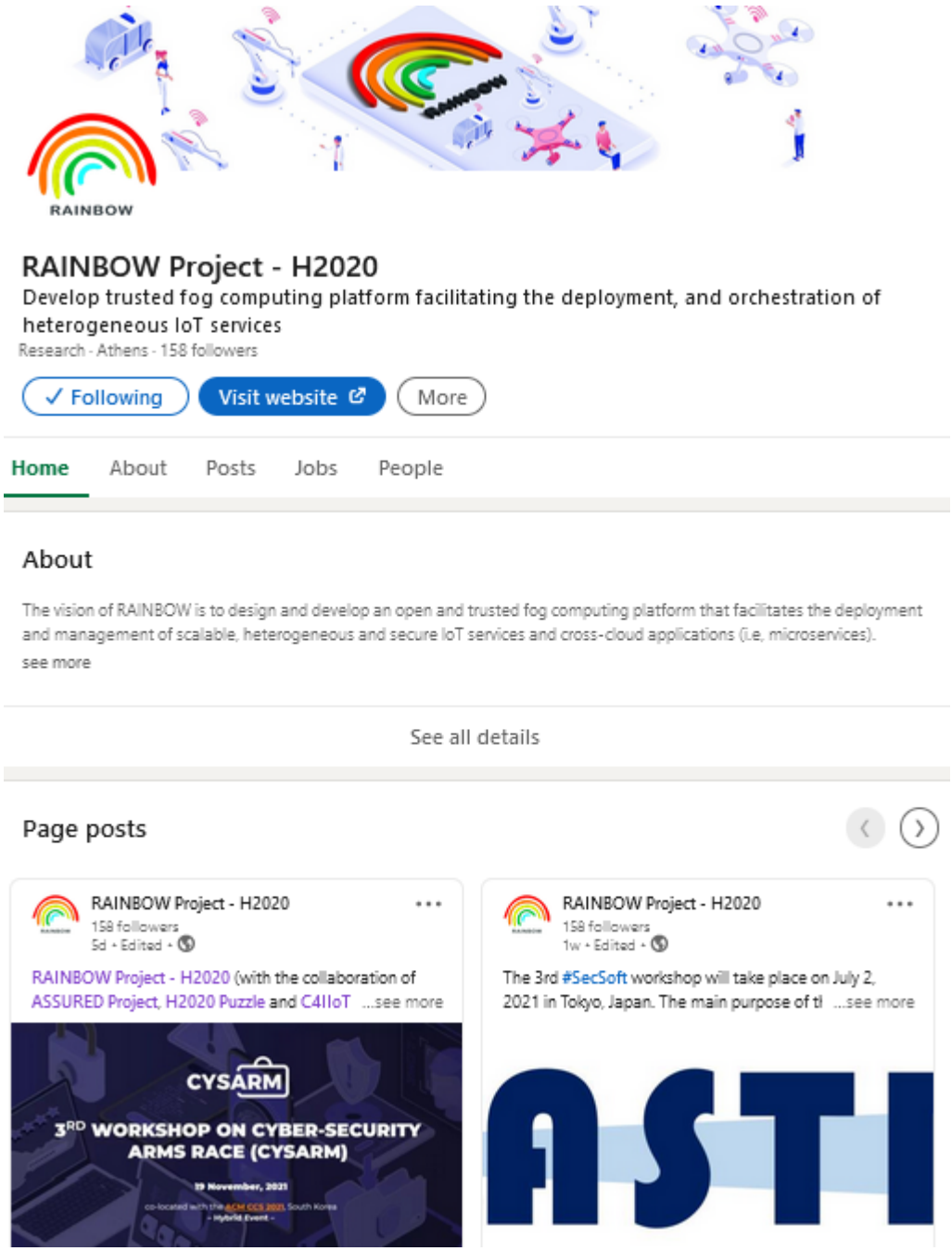


Figure 27: RAINBOW LinkedIn page

Figure 28 provides an overview of visitor's metrics since the project started. Peaks are observed during project's events, like plenary meetings and also when project major announcements took place (like newsletter releases, collaboration with another projects, interesting blogs in the news area and more).

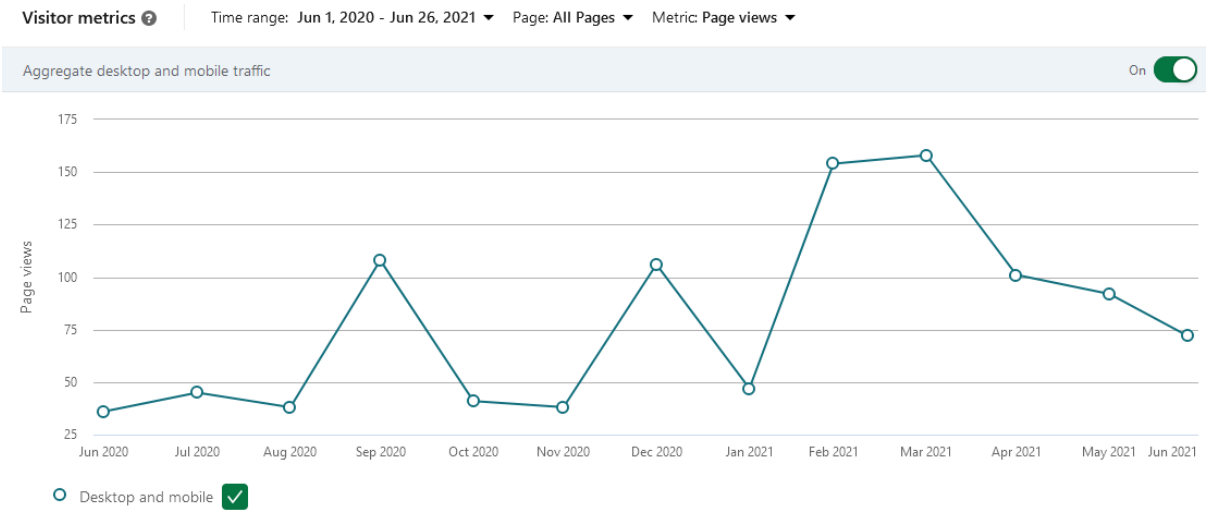


Figure 28:LinkedIn visitors overview

Figure 29 displays the number of interactions (likes, shares, clicks, comments) that were observed in the RAINBOW LinkedIn page. It is observed that with the increase of the posts since M14, the number of interactions has also increased sharply.

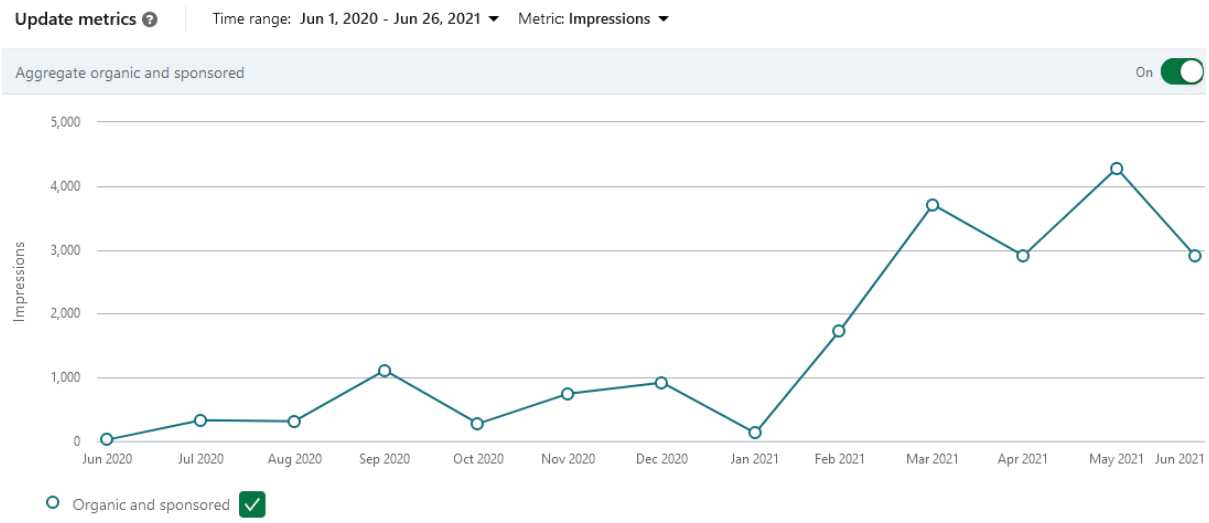


Figure 29: LinkedIn updates overview

4.2 Twitter

Until the M18, 75 tweets were made while the project account (https://twitter.com/RainbowH2020) has 70 followers as illustrated in the Figure 30.

Figure 30: RAINBOW Twitter Account

The analytics for the previous 13 months are presented in the following figures (31-35). During the period of M6–M9 4.7k twitter impressions were counted. Impressions on Twitter is a total tally of all the times the Tweet has been seen. This includes not only the times it appears in a one of your followers' timeline but also the times it has appeared in search or as a result of someone liking the Tweet.

For the period of M9–M12 7.1k impressions were counted, from M12-M15 6.8k impressions were counted and for the period of M15-M18 22.6k. So in total of the thirteen-month period M6-M18 we had an overall of 41.2k impressions.

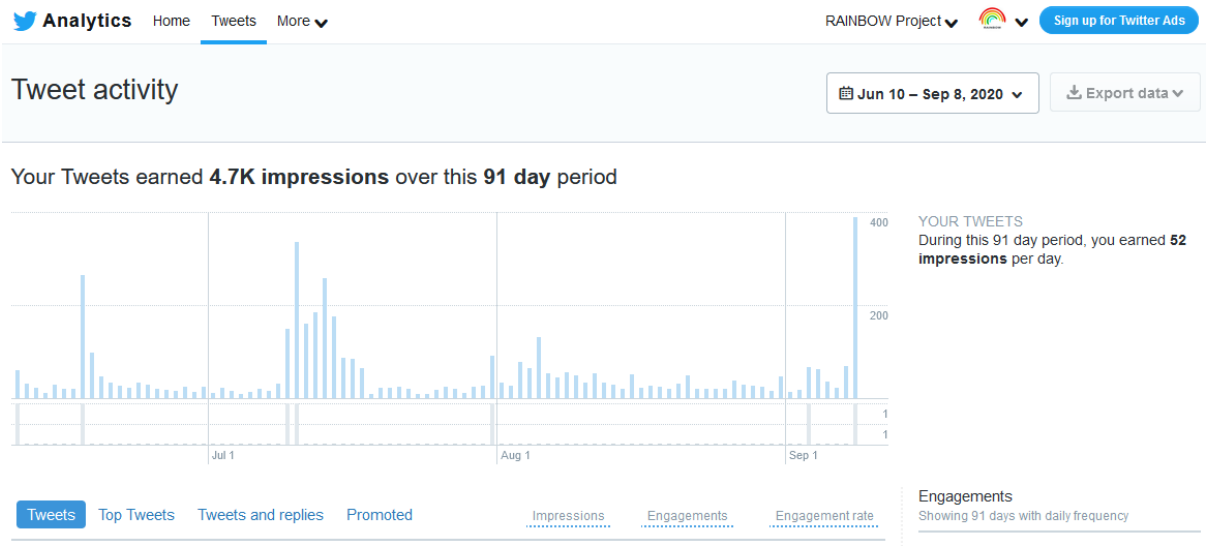


Figure 31: Twitter Statistics M6-M9

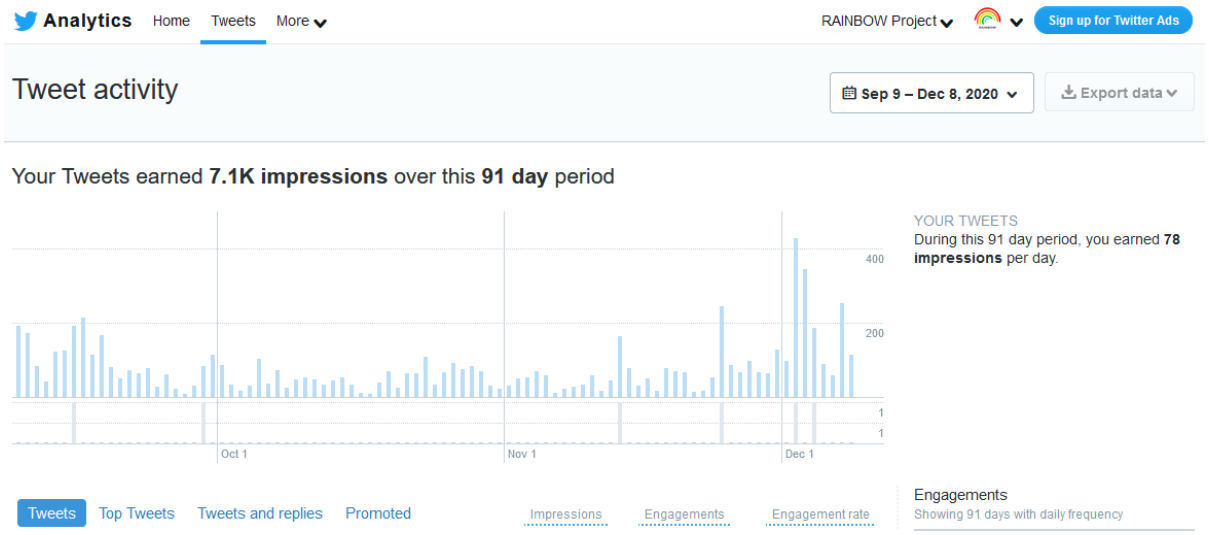


Figure 32: Twitter Statistics M9-M12

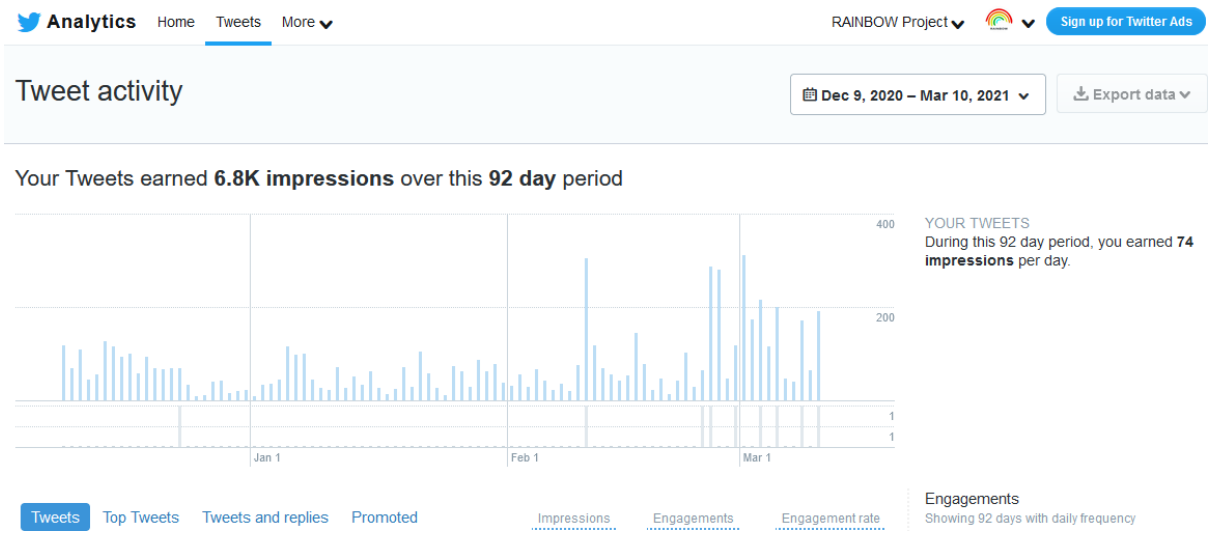


Figure 33: Twitter Statistics M12-M15

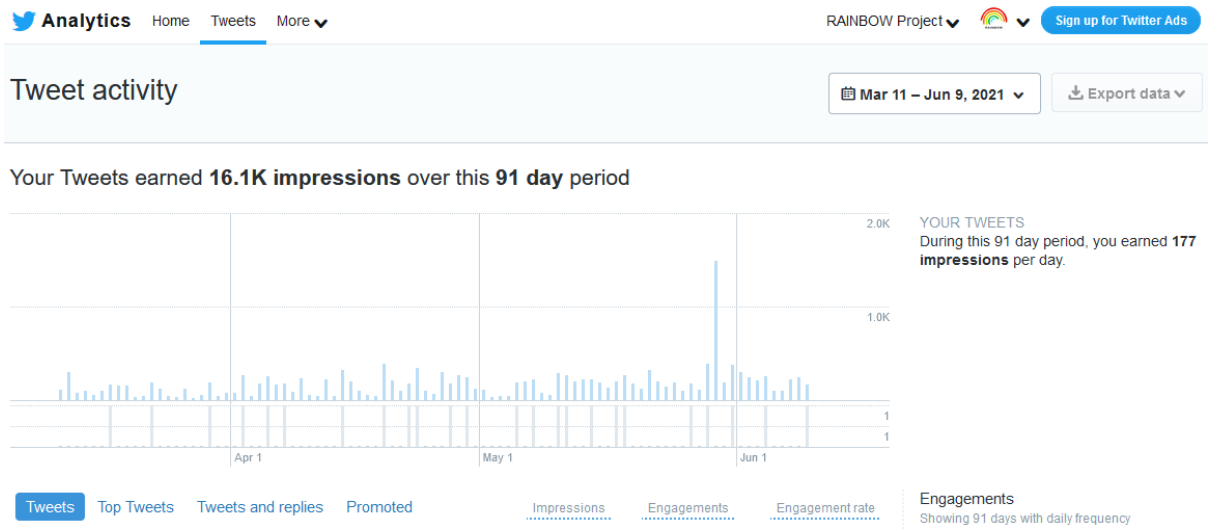


Figure 34: Twitter Statistics M15-M18

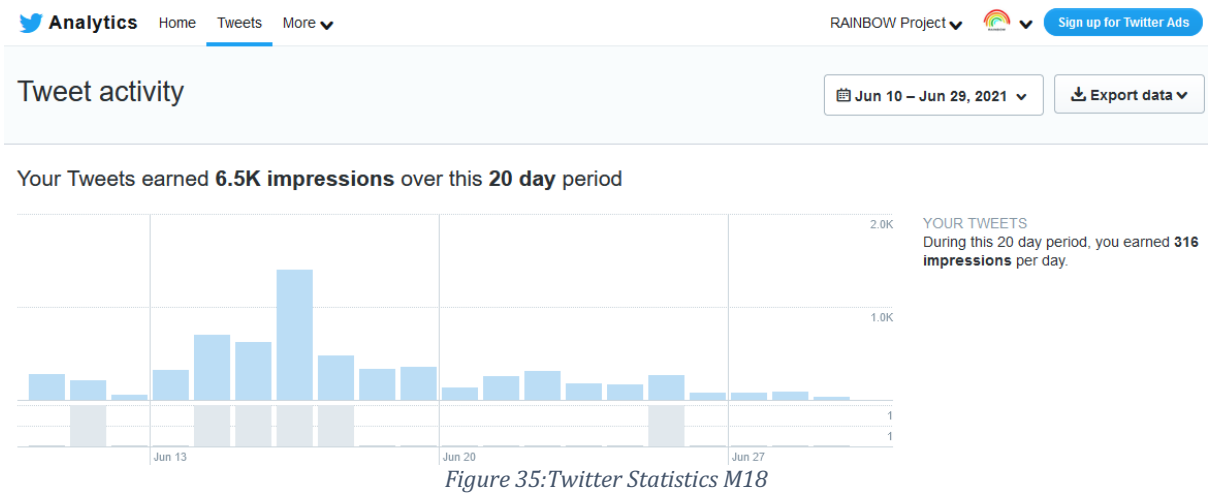


Figure 35:Twitter Statistics M18

4.3 Facebook

Figure 36 is a screenshot of the RAINBOW Facebook page (https://www.facebook.com/RainbowProjectH2020). As of M3 the page has gathered 145 followers.
Facebook Insights provides detailed analytics concerning the page, in order for someone to track what works, learn how people interact with the content, and improve the results over time.

Figure 36: RAINBOW Facebook page

Figure 37 provides an overview concerning last posts published on Facebook. Figure 38 presents an overview on Facebook statistics, since the project started. Larger numbers are observed during posts concerning project's important announcements like plenary meetings, revamping of the website, release of a newsletter, interesting blog articles etc.

All posts published

Create Post

Reach: Organic/Paid | Post clicks | Reactions, comments & shares

Published	Post	Type	Targeting	Reach	Engagement	Promote
25/06/2021 14:15	Dr. Lance B. Eliot, a world-renowned expert on Artificial Intelligence (#AI),			76	1 6	Boost post
23/06/2021 14:51	Our colleagues from the Pledger Project have published a new blog			49	4 7	Boost post
17/06/2021 15:04	Smart cities are on the rise with some cities around the world famed			35	3 4	Boost post
16/06/2021 14:09	Sharing the news! Join the webinar which is hosting by the colleagues of			34	2 3	Boost post
14/06/2021 19:52	Rainbow Project (with the collaboration of ASSURED Project,			113	2 12	Boost post
11/06/2021 18:15	The 3rd #SecSoft workshop will take place on July 2, 2021 in Tokyo,			37	1 6	Boost post
10/06/2021 12:46	On 15 June 2021, 15:00 – 16:30 pm CEST, HORIZON CLOUD is			34	0 4	Boost post
09/06/2021 20:49	#RAINBOW_H2020 was among the supporting projects of the			136	8 12	Boost post
08/06/2021 16:39	The Covid-19 pandemic is radically accelerating the pace of change in			41	2 3	Boost post
04/06/2021 15:45	Sharing the news! Join the #DevOps Berlin #conference and during the			35	1 4	Boost post
02/06/2021 14:52	27 CEOs of leading EU companies presented a #roadmap highlighting			36	3 3	Boost post
31/05/2021 15:15	The 4th issue of our newsletter is now available here rainbow-			263	13 19	Boost post
28/05/2021 12:45	The 4th Plenary Meeting of the Rainbow Project took place virtually			53	3 9	Boost post
26/05/2021 19:00	Our colleagues from the Pledger Project have shared an interesting			42	3 5	Boost post
21/05/2021 15:48	What should the future of #digital in Europe be? What should our 2030			41	2 7	Boost post
18/05/2021 12:54	The 4th plenary meeting of the #rainbow_h2020 project is ongoing!			103	21 19	Boost post

Figure 37: Facebook Posts Statistics

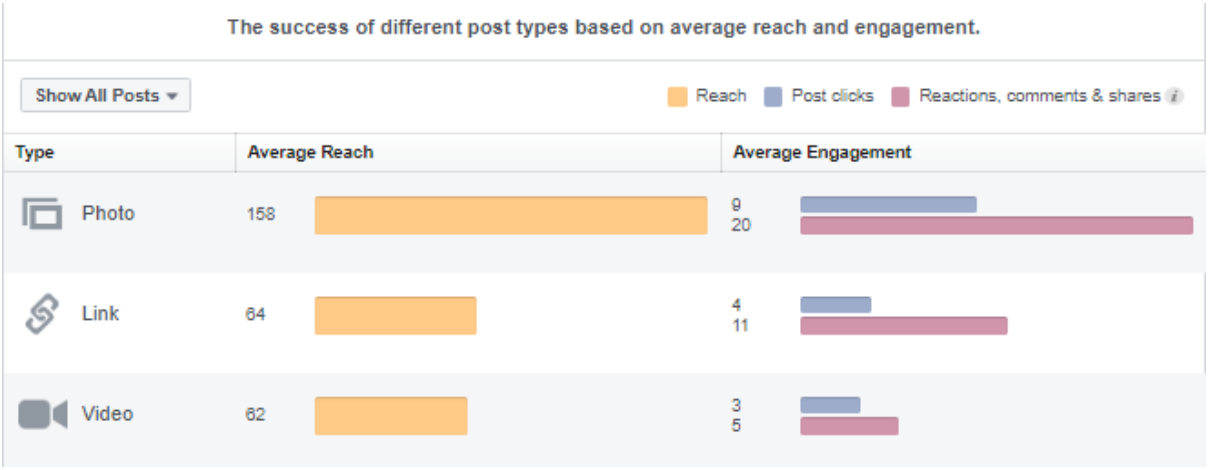


Figure 38: Facebook statistics on post types

4.4 Instagram

The RAINBOW Instagram page was created during M17. On the Instagram account of RAINBOW will be posted important things related with the project such as news, events, deliverables etc. (https://www.instagram.com/rainbow.2020.eu/)

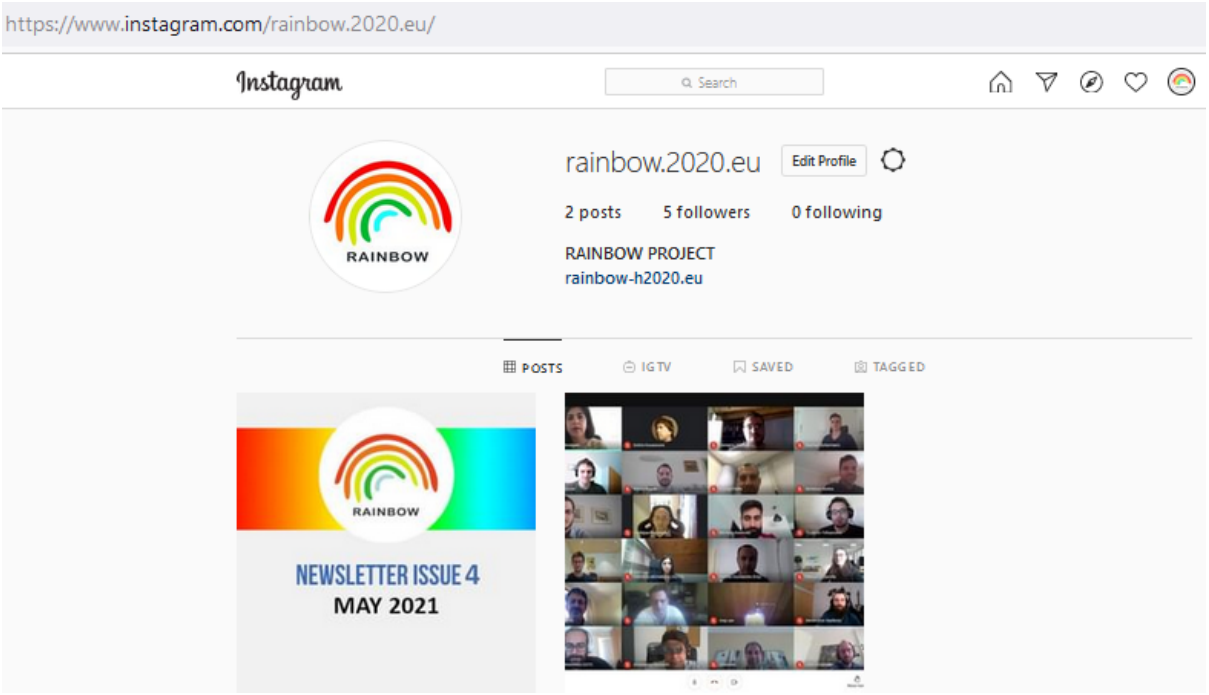


Figure 39: RAINBOW Instagram page

4.5 ResearchGate

ResearchGate is the professional network for scientists and researchers. K3Y is responsible to update RAINBOW's ResearchGate page by adding partners accounts. Due to how ResearchGate works to add collaborators their accounts must be connected (follow each other). K3Y has already notified the partners of this requirement. The RAINBOW ResearchGate page is created during M14.

Figure 40: RAINBOW ResearchGate page

4.6 YouTube

The RAINBOW channel on YouTube (https://www.youtube.com/channel/UCRcOGrINaV9wWh6Bih11-KA) was created during M17. This channel will host 3 forthcoming videos covering aspects of RAINBOW (*RAINBOW Approach, RAINBOW Platform and RAINBOW Use Cases*) as well as any other related material produced by the RAINBOW project.

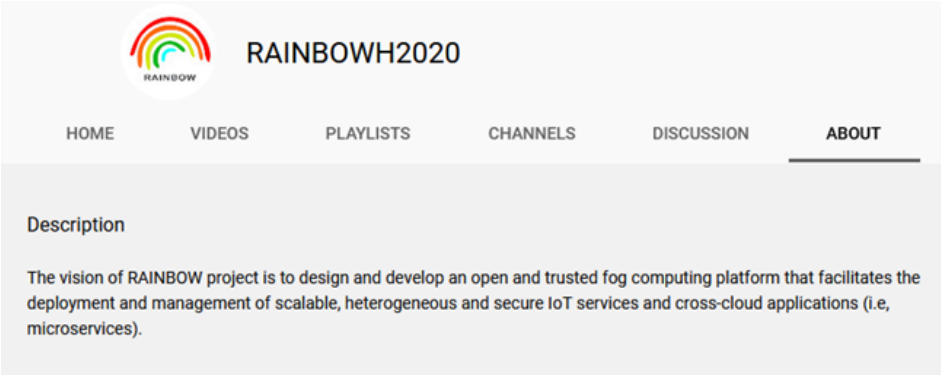


Figure 41: RAINBOW YouTube channel

5 RAINBOW Blog

The RAINBOW blog section (https://rainbow-h2020.eu/blog/) can be really useful as a means of increasing communication between the consortium and third parties. This section contains news, articles and information about the events which RAINBOW is organizing or attending (Figure 42 and Figure 43), as well as online version of the communication material.

RAINBOW project was kicked-off in Athens, Greece on February 2020

admin,
March 17,
2020
, Meetings,
0

RAINBOW project was kicked off!

The project has finally taken off in Athens during a two-day kick-off. The meeting of RAINBOW took place on 4-5th of February 2020 in Athens, Greece. The event was hosted by Ubitech, and gathered together representatives of the 15 partners, effectively constructing a strong consortium! Special thanks to the Ubitech team for hosting us!

During the event, partners had the chance to present their organisations as well as discuss in person the expectations for the project, together with the challenges and potentials related to its implementation. All partners presented their tasks and explained the respective aims, plans as well as contributions to the achievement of the project goals. The action plan for the first semester has been agreed upon, and an overview of the steps for the following 6 months has been presented.

Figure 42: Kick-off meeting of RAINBOW Project

Figure 43: 1st Workshop on dependability and safety emerging cloud and fog systems

Blog posts should involve aspects or conventions related to the project, including more extensive descriptions about project achievements and demo versions. Additionally, the blog section may serve as a means of increasing the traffic of the project webpage and a reason for visitors to check back the website at a later stage.

5.1 Roadmap

A plan for blog posts was introduced by WP7 Leader AUTH in M14, involving monthly publications from partners. The first step of this plan includes a series of blog posts to be published on the RAINBOW website and also promoted through the project's social media. Each post assigned to a partner based on their expertise and role in the project (short texts, about 400-600 words, aimed at a specific topic within RAINBOW). Table 7 shows that the posting rate targets a new item going public every 3 weeks. The end goal is to generate a steady production of content that includes topics of interest both to the general audience that would like to gain a better understanding of the Fog Computing concept and its uses, but also to more tech-savvy readers that seek insights on the specific work undertaken by the RAINBOW consortium.

Partner	Deadline	Suggested Topic/Idea
UBITECH	M14	Technology axes of the emerging Fog Computing landscape
UCY	M15	Fogify: utilizing an emulation framework to facilitate the modeling, deployment and experimentation of Fog testbeds
AUTH	M16	Comparison of distributed database frameworks for Fog analytics
DTU	M16	The value of establishing trusted attestation schemes in Fog services
TUW	M17	Suggested Topic/Idea: Fog Orchestration mechanisms: an overview
BIBA	M18	The role of Fog Computing in Human-Robot collaboration in industrial environments
CRF	M18	Digital transformation of urban mobility supported by Fog services
MSP	M19	Exploiting Fog features for power line surveillance via a swarm of drones

Table 7: Blog Post schedule per partner

After the end of this plan (M19), there will be a new detailed plan involving each partner, with the aim of creating more frequent blog posts publications, in order to achieve the KPI target of 100 blogs. These actions are working in parallel with the blog post publication actions handled by K3Y. In addition, more blog posts are expected regarding technical details from the first release of the platform.

5.2 Blog Posts

The number of posts in the blog section until M18 is 19. New interesting content is added regularly in the RAINBOW blog. Our partners are providing short technical articles and sharing news with regards to the Fog/Edge Computing and research advancements in the European Cloud ecosystem.

The following figures (Figure 44, Figure 45) represents only two out of the very interesting blog posts that have been uploaded to the website:

- **Technology axes of the emerging Fog Computing landscape** (https://rainbow-h2020.eu/technology-axes-of-the-emerging-fog-computing-landscape/)

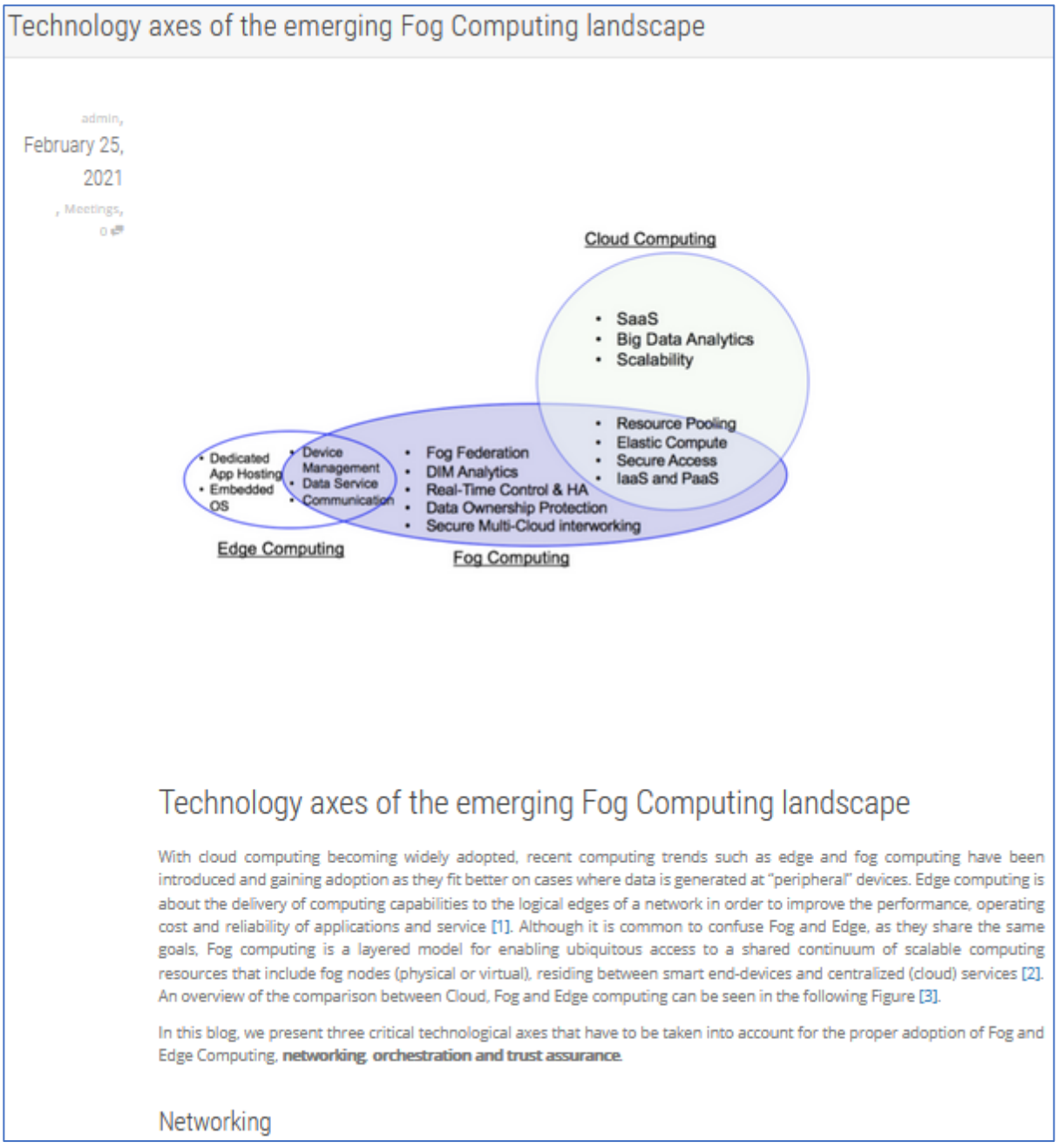


Figure 44: Blog post on Technology axes of the emerging Fog Computing landscape

- **Performance Comparison of Distributed Database Systems for Fog Analytics** (https://rainbow-h2020.eu/performance-comparison-of-distributed-database-systems-for-fog-analytics/

Performance Comparison of Distributed Database Systems for Fog Analytics

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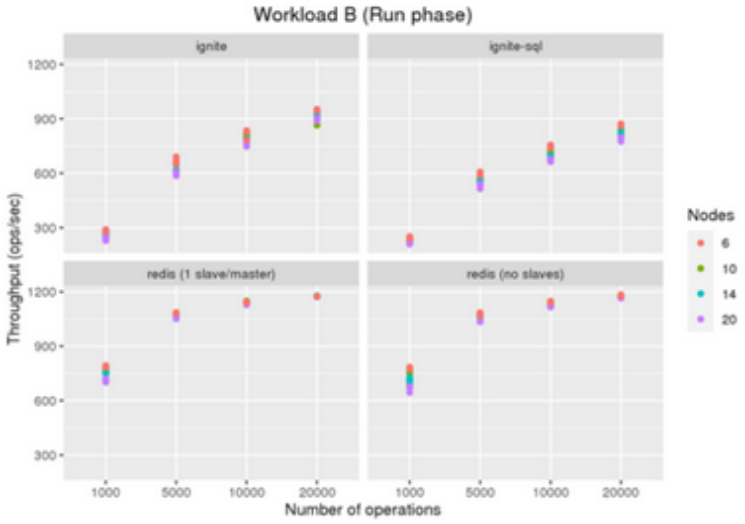

One of the vital software components of RAINBOW is the Distributed Data Storage and Sharing Service. Its role is to provide persistent and in-memory data storage capabilities to nodes scattered across the fog continuum to ensure in-time access to recently collected monitoring data by collaborating entities (i.e., analytics, orchestration, routing). Data that are stored locally on fog nodes need to be accessed with low-latency. Data also need to be replicated and partitioned across nodes to ensure user-desired data quality constraints for reliability and fault-tolerance. Real-time analysis on-the-fly is crucial when dealing with Edge Computing applications and streaming data. Scalability is also critical in Edge Computing as the number of network-connected devices can increase considerably.

Two distributed databases that could potentially fill that role are Redis and Apache Ignite. The basic properties of these two databases can be seen in the following table:

	Redis	Apache Ignite
ACID compliance	Not always guaranteed	Full support for distributed ACID transactions
Cluster model	Leader-worker	All nodes are equal
Persistence	Yes	Yes (optional)
Consistency	Not guaranteed	Yes (if persistence is enabled)
Data sharing	Only replicated and partitioned data	Supports replicated, partitioned and local data

In order to assess their performance, we employed the well-know Yahoo! Cloud Serving Benchmark (YSCB) suite, which is a standard benchmark and benchmarking framework to assist in the evaluation of different cloud systems. YCSB offers 6 standard workloads, that correspond to different application needs and which allow to understand the performance tradeoffs of different systems.

Since our purpose was to assess both the performance and scalability of the Ignite and Redis distributed databases, we executed different settings of both databases on network configurations of 6, 10, 14 and 20 nodes using in-memory

Figure 45: Blog Post on Distributed database systems for fog analytics

6 Traditional Media

RAINBOW will issue a number of press releases to highlight milestones of the project and to announce significant events and developments. Their distribution will be geared towards achieving a wide press and media coverage about the project. According to the initial communication roadmap a total of 10 press releases are expected throughout the project's lifetime. These press releases will be published in all project's communication channels and also circulated by all partners to their business networks and media contacts. They will be sent for publication to various local, European and international information providers (e.g. journalists, magazines, electronic newspapers, newsletters, technical associations, decision makers) to maximize their reach and impact.

6.1 Press Releases

The first press release was issued during M17 https://rainbow-h2020.eu/rainbow-4th-plenary-meeting/ (Figure 46).
Afterwards, the plan includes press releases about videos developed in the context of disseminating the project, about the first platform release and every major deliverable which involves the project.

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RAINBOW 4th Plenary Meeting

The 4th Plenary Meeting of the RAINBOW project took place on 18-19th of May 2021. The event was carried out online and gathered together representatives of the 15 members of the RAINBOW consortium. The project coordinator, UBITECH Ltd, organized and supported the whole process during the 2-days meeting. In the meeting, all partners had the chance to present the progress of their tasks, along with the challenges and potentials related to their implementation. Key subject of the meeting was the first RAINBOW Platform release of the project that is expected at the end of June.

Goals of the 4th Plenary Meeting:

- *Clear understanding of the current state of development of RAINBOW's technological components*
- *Guidelines on the integration procedure and the elaboration of the integration plan towards the early release of the RAINBOW Platform*
- *Alignment with Demonstrators' and Use Cases' latest developments*
- *Monitor and intensify dissemination and communication activities*
- *Planning on the upcoming mid-term project review (July 2021)*

About RAINBOW

The vision of RAINBOW is to design and develop an open and trusted fog computing platform that facilitates the deployment and management of scalable, heterogeneous and secure IoT services and cross-cloud applications (i.e., microservices).

RAINBOW falls within the bigger vision of delivering a platform enabling users to remotely control the infrastructure that is running, potentially, on hundreds of edge devices (e.g., wearables), thousands of fog nodes in a factory building or flying in the sky (e.g., drones), and millions of vehicles travelling in a certain area or across Europe.

RAINBOW aspires to enable fog computing to reach its true potential by providing the deployment, orchestration, network fabric and data management for scalable and secure edge applications, addressing the need to timely process the ever-increasing amount of data continuously gathered from heterogeneous IoT devices and appliances. The developed solution will provide significant benefits for popular cloud platforms, fog middleware, and distributed data management engines, and will extend the open-source ecosystem by pushing intelligence to the network edge while also ensuring security and privacy primitives across the device-fog-cloud-application stack.

RAINBOW has received funding from the European Union's Horizon 2020 framework programme for research and innovation under grant agreement No. 871403.

Figure 46: Press Release on 4th Plenary Meeting

7 Communication Material

AUTH and K3Y prepared some dissemination material, and more specifically, a flyer, a brochure and four e-newsletters. This material was produced in order to communicate to the target audience the RAINBOW's approach, open challenges, KPIs, objectives, stakeholders, consortium, use cases and much more. Flyer, brochure and newsletters share a uniform presentation style and are designed with the project's colours. They include also the project logo, the project's social media and website links, and of course the proper EU acknowledgment and disclaimer, according to the Grant Agreement. All this useful information, which has been included in this material, is intended to inform adequately readers who do not have a thorough knowledge about RAINBOW and are attracted by the topics covered in the project.
Moreover, in terms of communication material, K3Y will create, during the second half of the project, 3 videos that will cover all major aspects of RAINBOW.

7.1 RAINBOW Flyer

During the M12 of the project duration, an informative flyer was produced in an aim to provide brief information about the project and its objectives. As an official project material, includes the appropriate EU funding logo and acknowledgements. Furthermore, the flyer provides information such as accessing the project website, social media icons, partners' logos, description of Key Performance Indicators and the use cases that RAINBOW uses to validate the platform. The flyer is accessible under the promo material page on our official website (https://rainbow-h2020.eu/promo-materials/). Due to COVID-19 restrictions there was no physical event where the flyer could be disseminated as a hardcopy. Therefore, it was released in M12 where the flyer's content was already produced. The flyer is presented in Figure 47 & Figure 48:

Figure 47: RAINBOW Flyer - Page 1

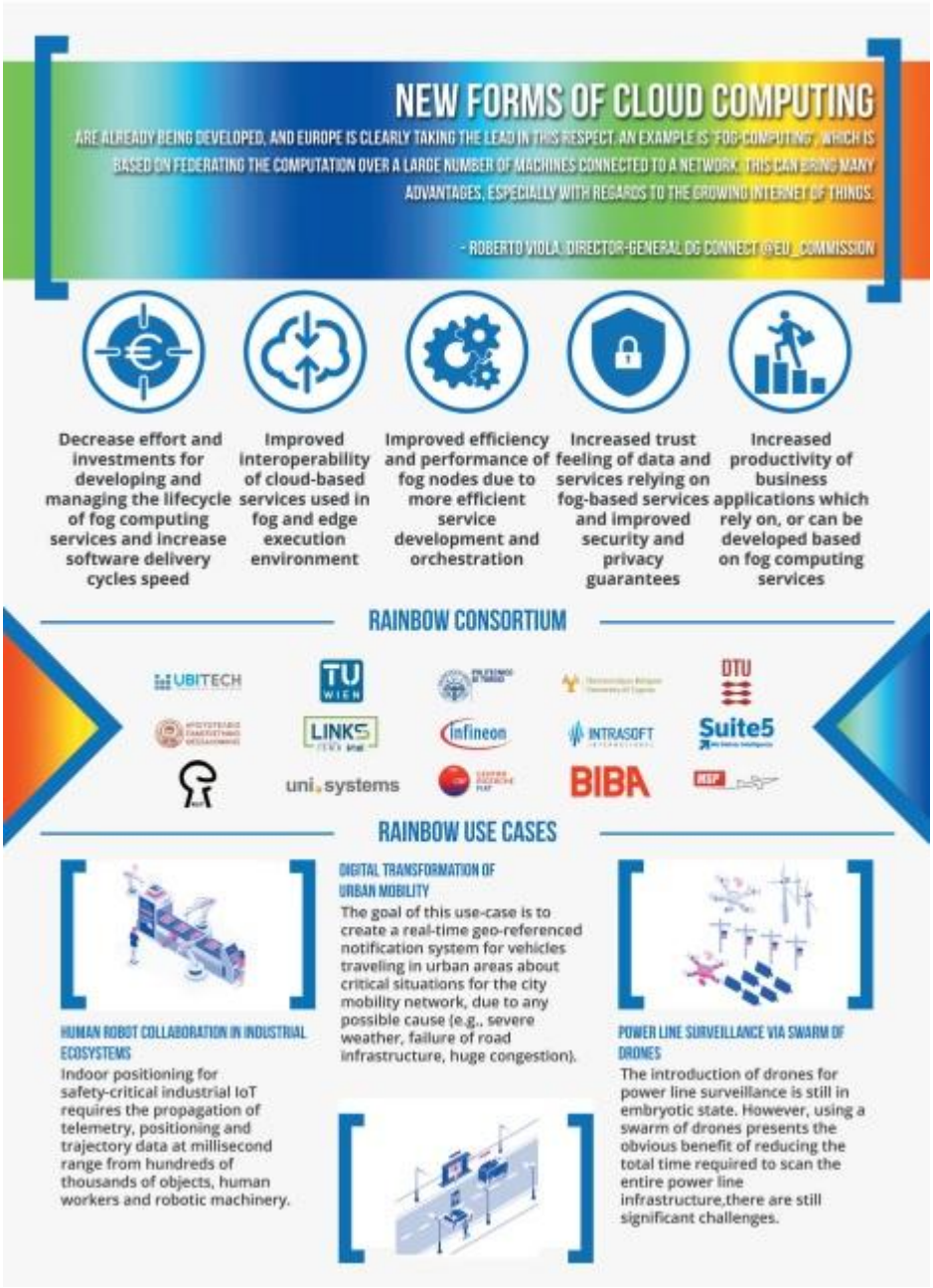

Figure 48: RAINBOW Flyer - Page 2

7.2 RAINBOW Brochure

The RAINBOW brochure, prepared and released on M12, was designed in order to support the project partners in the successful dissemination of RAINBOW ideas and results. The brochure design is presented in Figures 49-51. It provides information contact and project details similar like the RAINBOW flyer, the objective of each use case,

RAINBOW KPIs, RAINBOW consortium and RAINBOW objectives. The brochure is also available under the promo material page on our official website (https://rainbow-h2020.eu/promo-materials/).

Figure 49: RAINBOW Brochure - Page 1

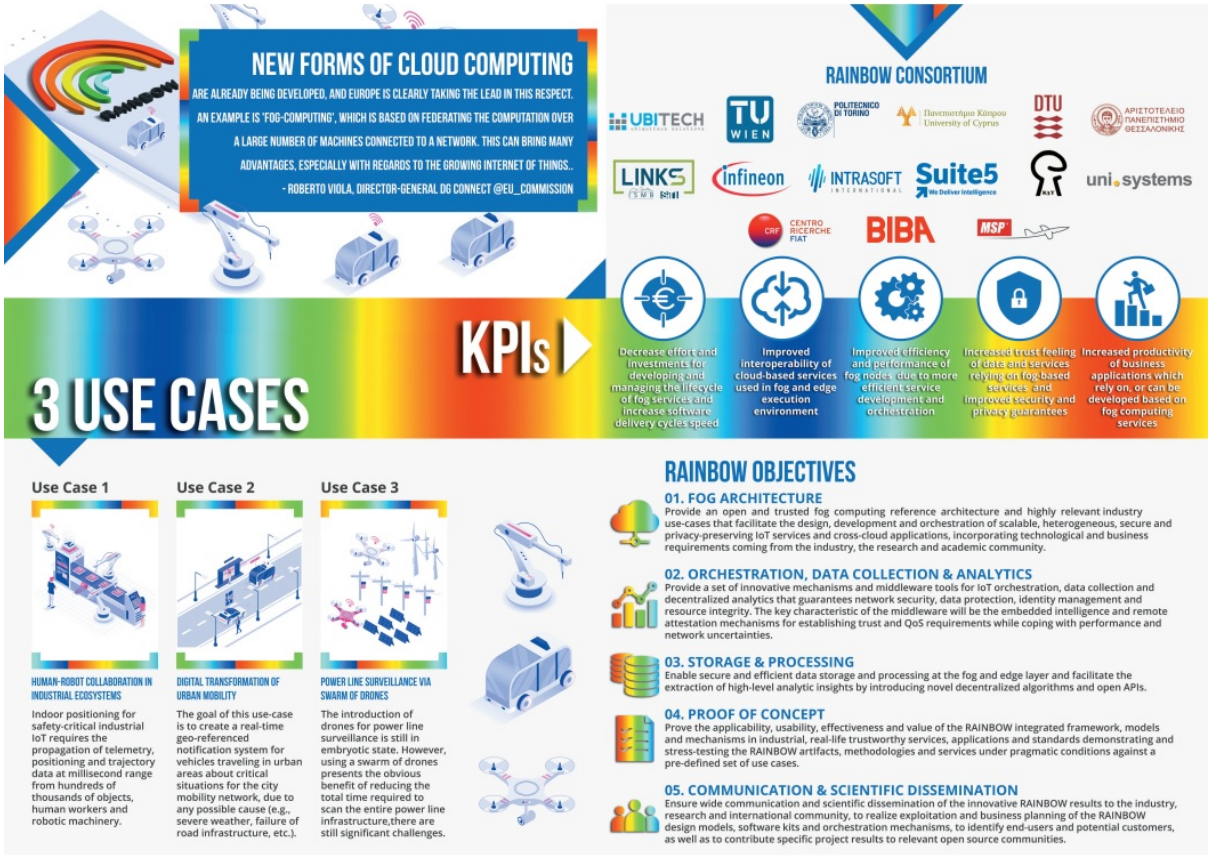

Figure 50: RAINBOW Brochure - Page 2

Figure 51: RAINBOW Brochure - Page 3

7.3 RAINBOW e-Newsletter

A plan for delivering twelve e-Newsletters targeted towards the general public was introduced at D7.1. Four RAINBOW e-Newsletters have been published so far, and they can be found in RAINBOW website: https://rainbow-h2020.eu/newsletters/
Electronic Newsletters are produced according to the schedule presented in D7.1, providing content about the project progress and outcomes, and any other relevant information that applies at the time of the publication. The e-Newsletters present major activities undertaken by RAINBOW, describe the project developments, deliverables' findings and the results that will be reached step-by-step, as well as RAINBOW's collaborations and synergies. Content suggestions also come from the project meetings and the consortium's overall collaboration. The length of the e-Newsletter may exceed the 4-pages limit, depending on the number of news and articles to be published.

The e-Newsletter's issues contain at least the following elements:

- *The RAINBOW logo*
- *The project details, i.e., start/end date and project duration, the specific HORIZON call and the Grant Agreement reference, EU funding*
- *The web address of the RAINBOW website*
- *The contact details of the RAINBOW project and social media channels*
- *The standard disclaimer for the HORIZON Programme*

In order to be easily accessible, the project e-Newsletters were made available for reading and downloading through the project website, the project social media and through the individual partners social media through reposts/re-sharing. Also, e-Newsletters are posted under the Blog page on RAINBOW website.
The first e-Newsletter was prepared in M7, the second in M11, the third in M14 and the fourth in M17. Figure 52 & Figure 53 presents e-Newsletter issues 1 and 2:

Figure 52: RAINBOW e-Newsletter - Issue 1

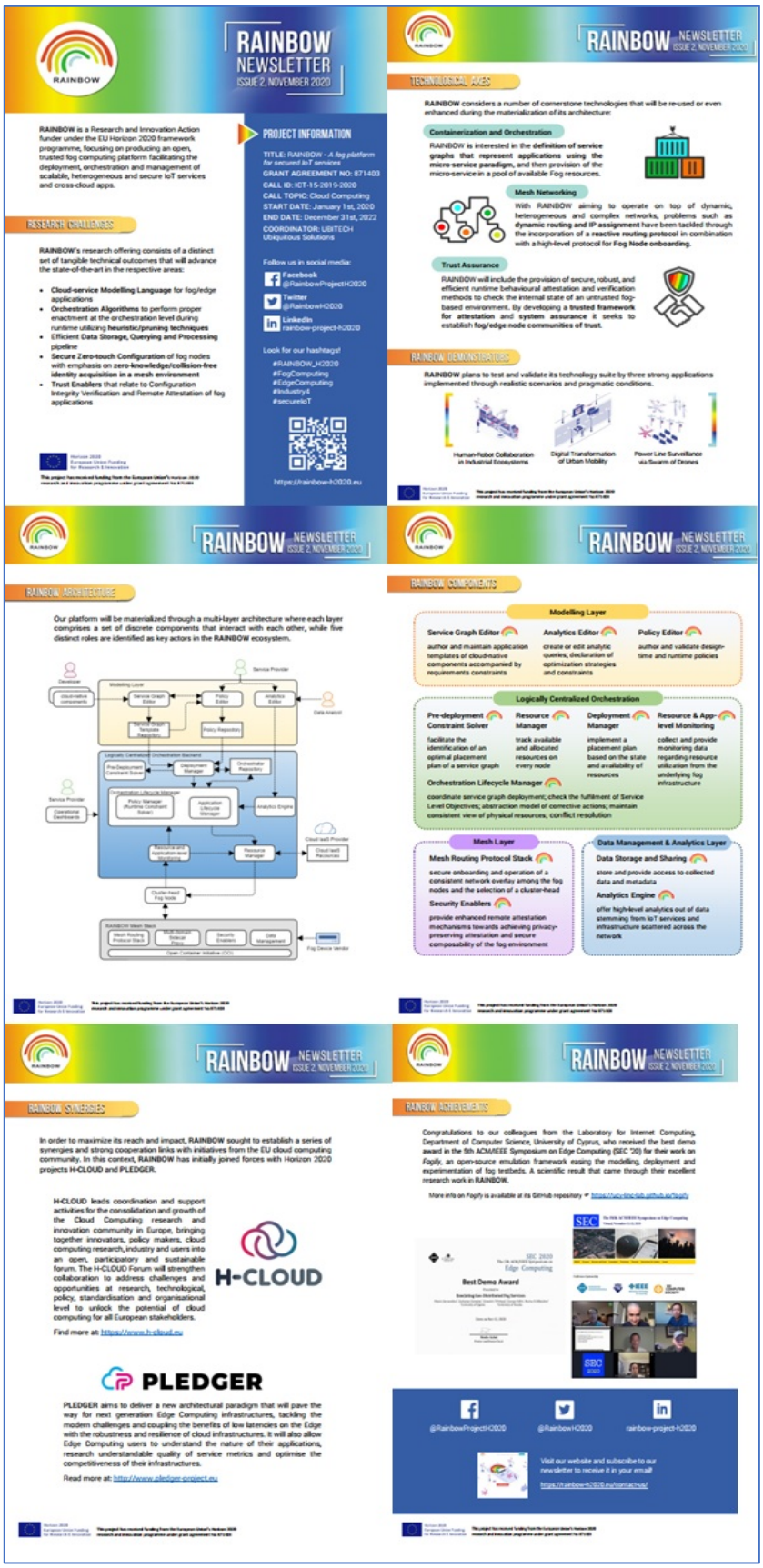

Figure 53: RAINBOW e-Newsletter - Issue 2

7.4 RAINBOW Video

K3Y prepared a 5-minute RAINBOW representative video. The partners found the video content and composition excellent but the major issue found concerned the long duration of the video. So, K3Y, in collaboration with UBITECH, UCY and AUTH, will create 3 new videos (based upon the original demo video), each with less than 3-mins duration, with the following content:

- *1st Video – RAINBOW Approach*
  A general introductory video about the concept and the targets of the project.

- *2nd Video – RAINBOW Platform*
  This video will describe the platform and the components/services that includes.

- *3rd Video – RAINBOW Use Cases*
  It will focus in the description of the 3 project demonstrators.

The videos will be uploaded to the project's official YouTube channel and will be shared via the project's website and other online communication channels.

8 Conclusions and Next Steps

This deliverable presented the communication activities that took place during the first half of the project. During the second half of the project, the communication activities are going to be highly focused on the integrated platform that will be released soon. Those activities are related with the revamping of the website, the release of new videos, the issuing of press releases, posts on social media, new blog posts etc. Furthermore, those actions will focus on communicating the upcoming Webinars that are designed by AUTH to be organized in the following months, as well as the shout out of Gitlab repository of RAINBOW that will be openly available in the next semester.
Most of the KPIs are in line with the initial plan. As mentioned in section 3, after the first release version of the RAINBOW platform, on line advertisement campaigns will be launched, so the website visit duration and all numbers regarding website statistics and social media followers shall improve. Regarding the step-up of blog posts, a relevant plan involving contribution from partners was presented in section 5. Moreover, a first relevant schedule was issued during M14 in order to increase the posts on social media channels. This plan includes issuing of posts from all partners by preparing one post per week. The issue of the posts must be relative with partners' expertise. A second plan was issued during M18. Regarding the traditional media, the strategy is the issuing of more press releases. Regarding traditional media, as mentioned in section 6, the plan includes press releases about the 3 new videos, the first platform release and every major deliverable which involves the project's achievements. It is certain that the KPI target of 10 press releases will be exceeded by the end of the project.

9 References

[1] R. Consortium, *RAINBOW Grant Agreement,* European Commission, 2019.

[2] V. Psomiadis, G. Kakamoukas and C. Stratigaki, "D7.1 – Communication Roadmap and Data Management Plan," RAINBOW Project, 2020.