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D7. 7 – Communication Activities Report Final

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	PP: Restricted to other programme participants (including the Commission)
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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	Work 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 D7.7 *"Communication Activities Report Final"*. More specifically, it describes thoroughly all the communication activities until the end of the project. In general terms, D7.7 presents everything that has been achieved in the context of the communication activities of the RAINBOW project. It is noted that this deliverable was completed shortly after the middle of M36, therefore the final figures for the month of December 2022 will be captured through the second periodic report in the beginning of 2023.

This deliverable contains a detailed description of all related activities and the specific channels such as the project website, social media, newsletters, banner, poster, videos, etc. used, regarding communication purposes of the project, fully implementing the online and offline communication strategy clearly defined in deliverable D7.1 *"Communication Roadmap and Data Management Plan"* (M3). Moreover, the current deliverable provides a more up-to-date revision to D7.6 *"Communication Activities Report Version 1"* (M18), as it includes all actions taken until the end of the project while following the communication plan, the monitoring process of the communication activities, and the fulfilment of the relevant KPI targets. The communication strategy is the point of reference for the execution of the respective activities throughout the project duration.

In overall, the RAINBOW website has been visited nearly 30,000 times by almost 7,000 unique users who, on average, spend more than 2 minutes in the website. Regarding the social media channels of the project, the numbers are also quite impressive, with almost 1200 total followers and over 1200 posts published. The number of posts in the blog section is 109. The RAINBOW project was issued 13 press releases. In terms of communication material, two flyers, two brochures, one banner and one poster were designed and produced. Also, 12 e-Newsletters have been published. Moreover, 3 videos have been created to introduce and explain all aspects of the project to our audience.

We must note that communication activities until the M29 of the project were accomplished mainly virtually, due to the impact of COVID-19. After M30, the gradual return to normality "allowed" plenary meetings to be held physically.

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 period of the 36 months. During all these months there was frequent and close collaboration with the WP7 leader AUTH on several issues. Moreover, AUTH provided guidance regarding the communication activities. This report will present all communication materials produced during these months such as the project website, logo, newsletters, flyer, brochure, banner, poster, created social media, videos, 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 is 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 final achieved status considering their targeted values:

Communication Mechanism	Related KPIs	Target Value (M36)	Achieved Value (M36)
CM1 Project's website	• **Unique Visitors** • **Average duration of visits** • **Page views**	**5,000** **2 min** **10,000**	**6,860** **02:18** **29,818**
CM2 Social media presence	• **Accumulative followers** • **Accumulative posts**	**750** **1,000**	**1,191** **1,227**

Communication Mechanism	Related KPIs	Target Value (M36)	Achieved Value (M36)
	• **Interactions**	**250**	**>250**
CM3 Project's blog	• **Posts** • **Interactions**	**100** **100**	**109** **>100**
CM4 Traditional media	• **Press releases**	**10**	**13**
CM5 Communication material	• **Project's factsheets, brochures and banners** • **e-Newsletters** • **Videos** • **Blog Posts in EC**	**6** **12** **1** **3**	**6** **12** **3** **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 was 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 was 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 revamped several times during the project period, compared to the original version delivered on M3 (see D7.1). In general, changes took place regarding text, visualization and the addition of new sections. Finally, on M36, the RAINBOW website has the following distinct areas:

i) **Landing page**. In the landing page significant changes occurred during the mayor revamping which took place on M17. The main menu was restructured, the Use Cases & KPIs have been removed from the front page. There is 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.

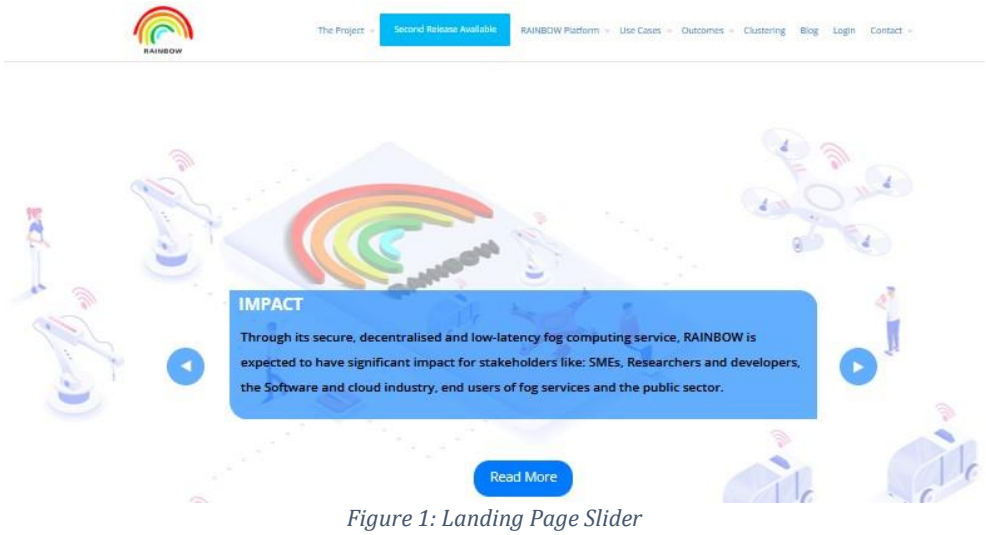


Figure 1: Landing Page Slider

Below the slider, there is an introduction of the project and the section of latest news.

ii) The section ***"The Project"*** gives information about the Concept and the Objectives of the project, the partners involved in RAINBOW, the Project Advisory Board, the Project Management Structure, and the Fog Adoption Industrial Focus Group (***Error! Reference source not found.***). The newest sub section regarding FA-IFG (since M26) includes a brief text explaining the focus group mission and scope and an online form in order to collect interest of people willing to join the focus group. There is also information about members which have agreed to be featured in the RAINBOW website and have provided photos and short descriptions.

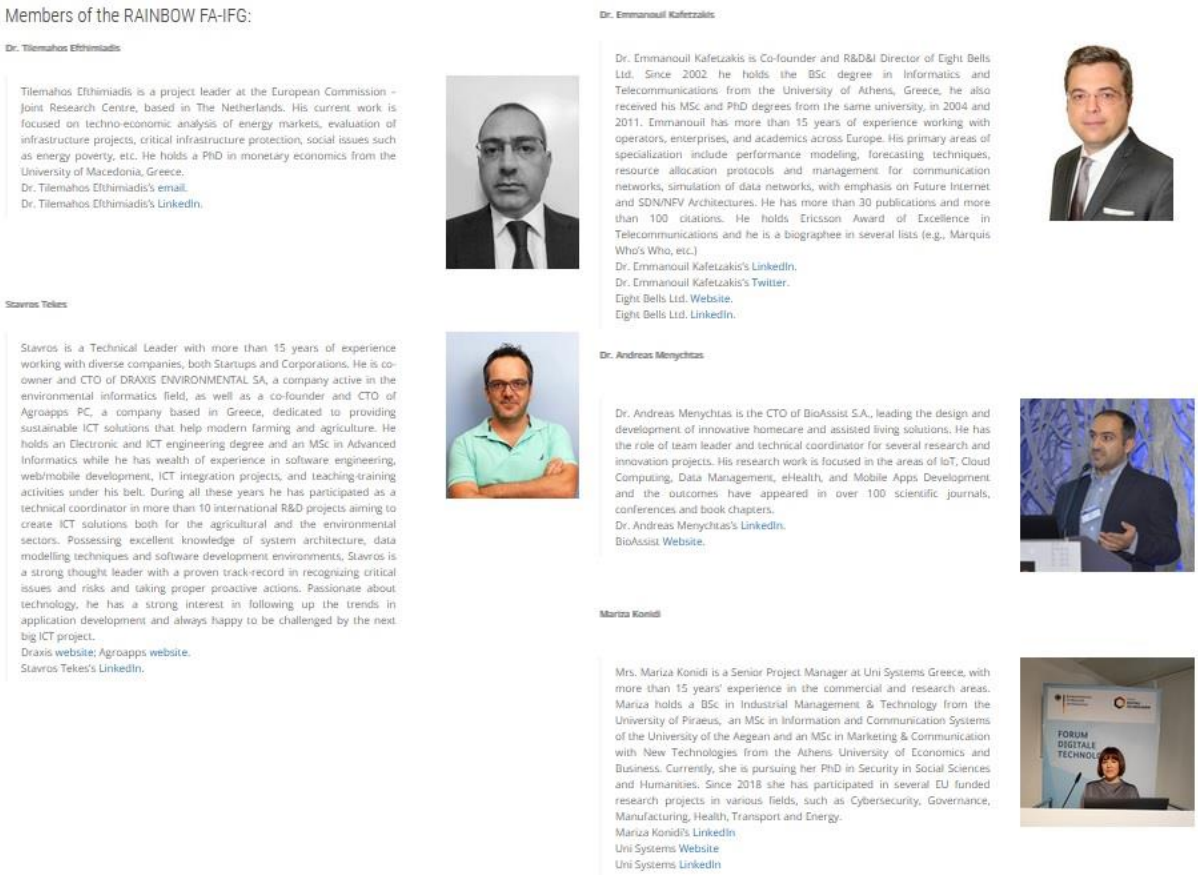


Figure 2: Members of the RAINBOW FA-IFG

iii) **Second Platform Release Available**. On May 2022, 29 months after the project's debut, RAINBOW reached a significant milestone by delivering the second version of its integrated fog computing platform. This section provides a general description regarding the 2nd release (*Figure 3*), access to the Gitlab repository and to the relevant deliverable "D5.3 RAINBOW Integrated Platform and Unified Dashboard - Second Release". Furthermore, in order to support adopters of RAINBOW, the visitor of the website can find useful regarding the online documentation of RAINBOW platform.

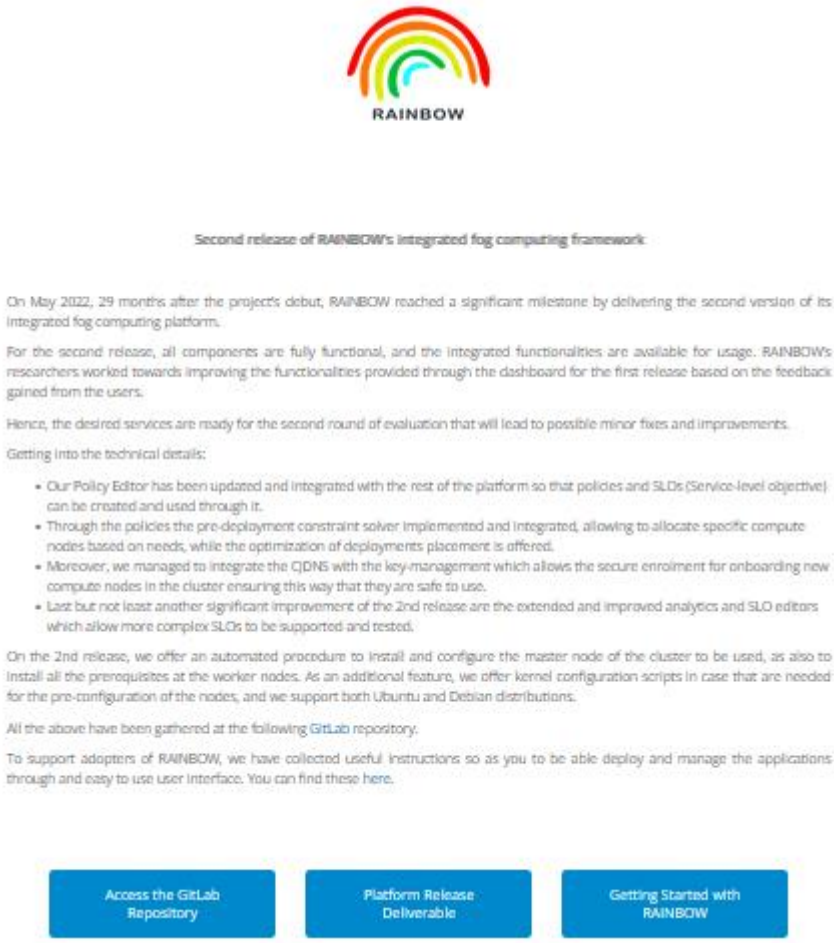


Figure 3: 2nd Platform Release

iv) **RAINBOW Platform**. Provides useful information about the platform of the project. There are plenty of details about the Rainbow Platform relating to the project's ***Motivation***, 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?*
Also, the visitor of the website can read more useful details about the project's ***Open Challenges***, as they can provide answers in critical questions such as: *What is missing from currently available technologies & solutions? What technological challenges are there?*
In the sub-section ***Mission & Vision***, there is relevant information to enlighten the visitor in terms of: *What is RAINBOW's novel offering? How will it answer the identified challenges?*
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?*

v) **Use Cases**. Contains details about the 3 Use Case scenarios.

vi) **Outcomes**. The content in this section includes information regarding *Public Deliverables, Publications*, *Promo Materials* (*brochures, flyers, banner, poster*) and *e-Newsletters*. There will be further analysis of Promo Material and e-Newsletters in a later chapter.
Since M26, the *"Webinars"* sub menu item was creating in order to make available all the information about the webinars that the project was organising there (such as brief description, the agenda, links to videos and/or presentations). The *Figure 4* below depicts the Webinars sub section.

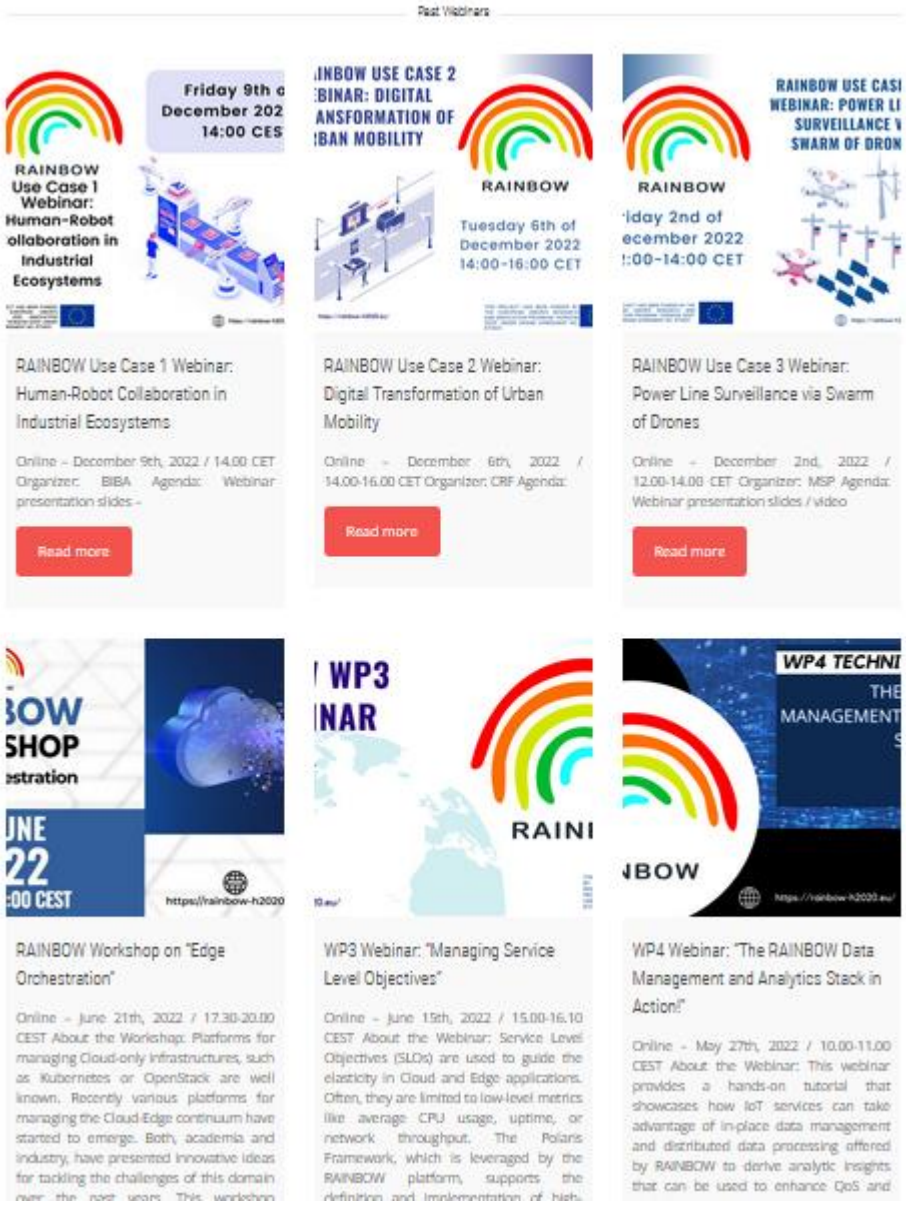


Figure 2: Webinars

vii) **Clustering**. This section contains affiliated projects with RAINBOW such as PLEDGER, MORPHEMIC, DataVaults, Glass, PUZZLE, inGOV, DataCloud and

UNLOCK CEI. Moreover, there is information about initiatives in which RAINBOW is a member, along with other cloud projects: HORIZON CLOUD and Future Cloud. *Figure* is a screenshot of RAINBOW Clustering.

Figure 5: Clustering

viii) 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.

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

x) 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.

3.2 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 edge/fog computing, microservices and cloud computing.	RAINBOW Project h2020
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 project Objective

Page	Title	Slug	Meta Description	Focus Keywords
			RAINBOW Objectives.	
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 3rd in the first page results:

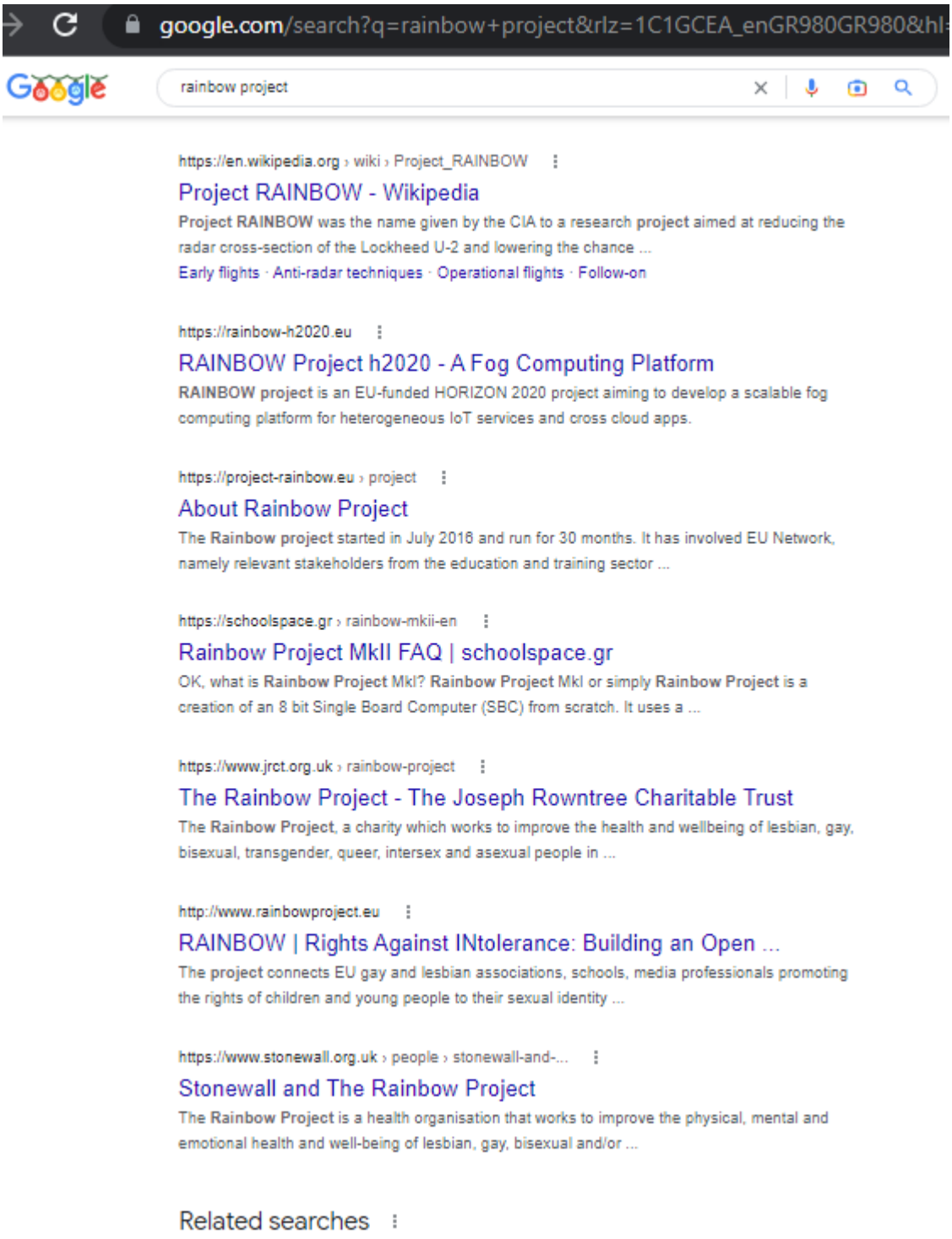


Figure 3: Search term "rainbow project"

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

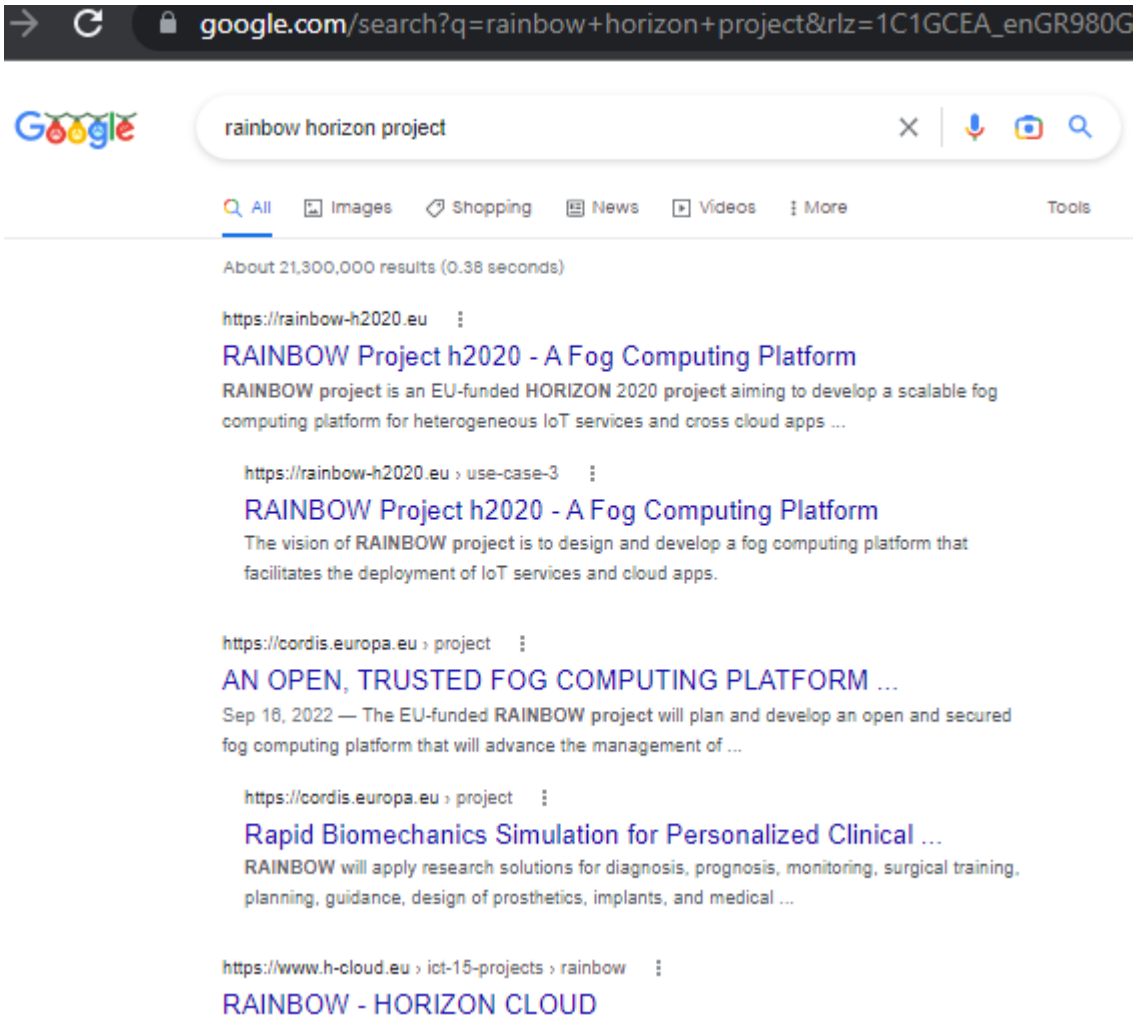


Figure 4: Search term "rainbow horizon project"

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

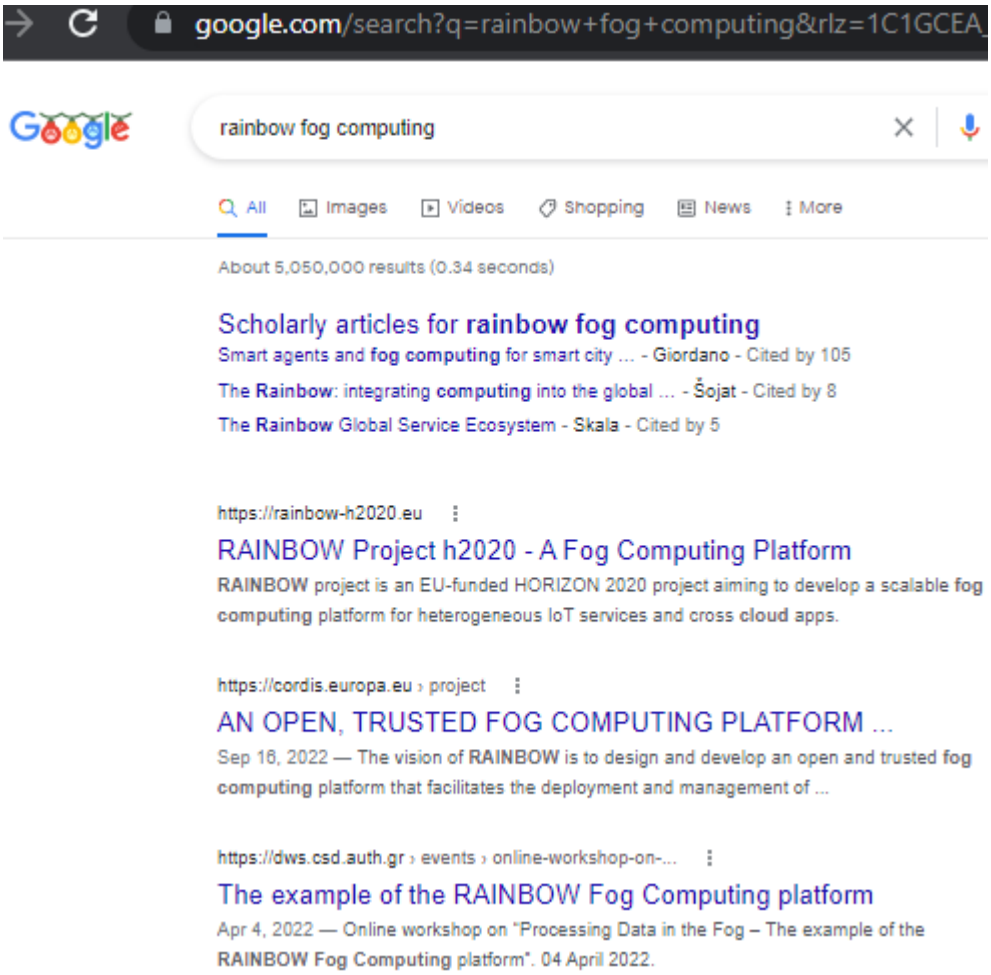


Figure 5: Search term "rainbow fog computing"

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

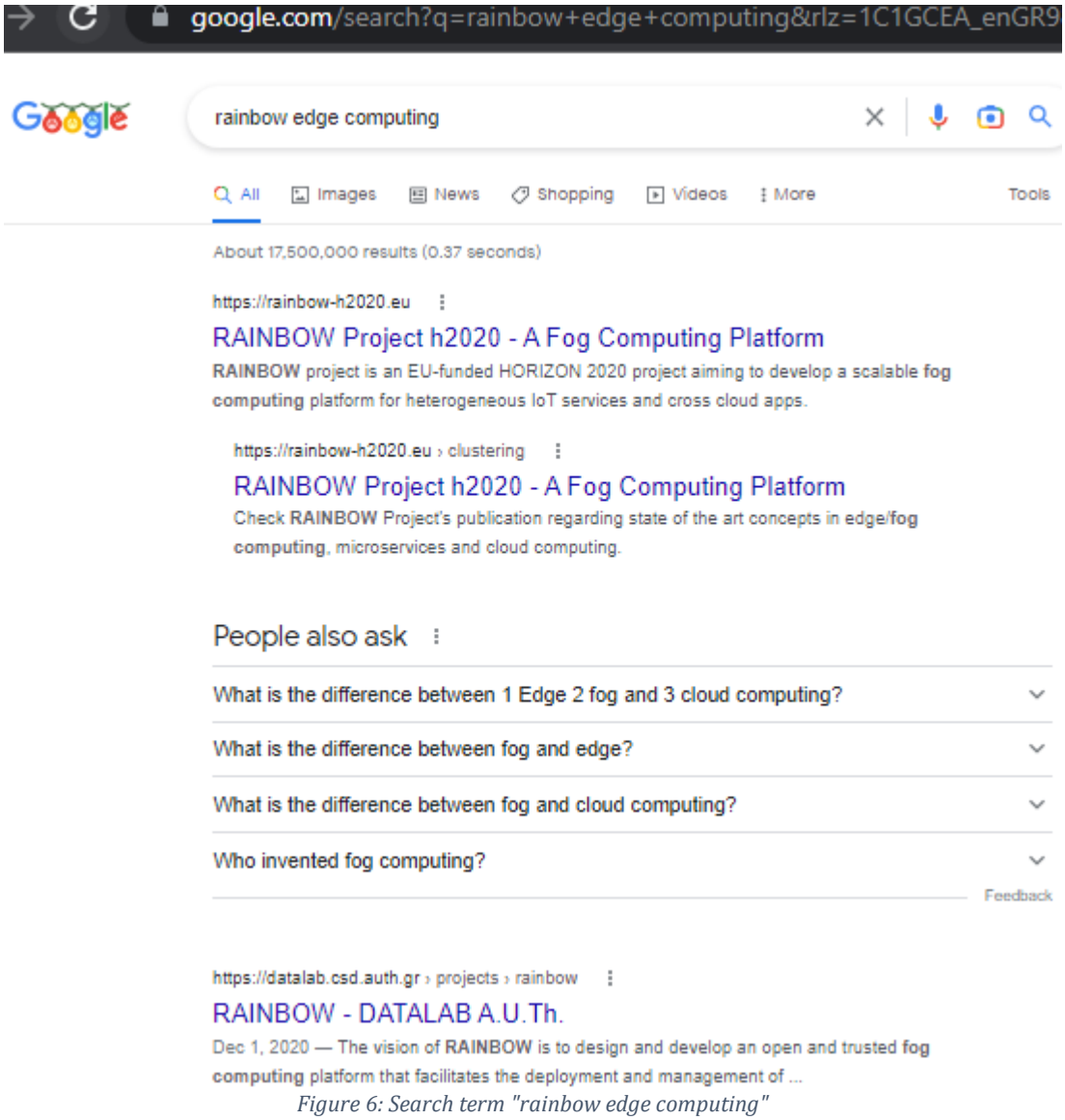


Figure 6: Search term "rainbow edge computing"

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

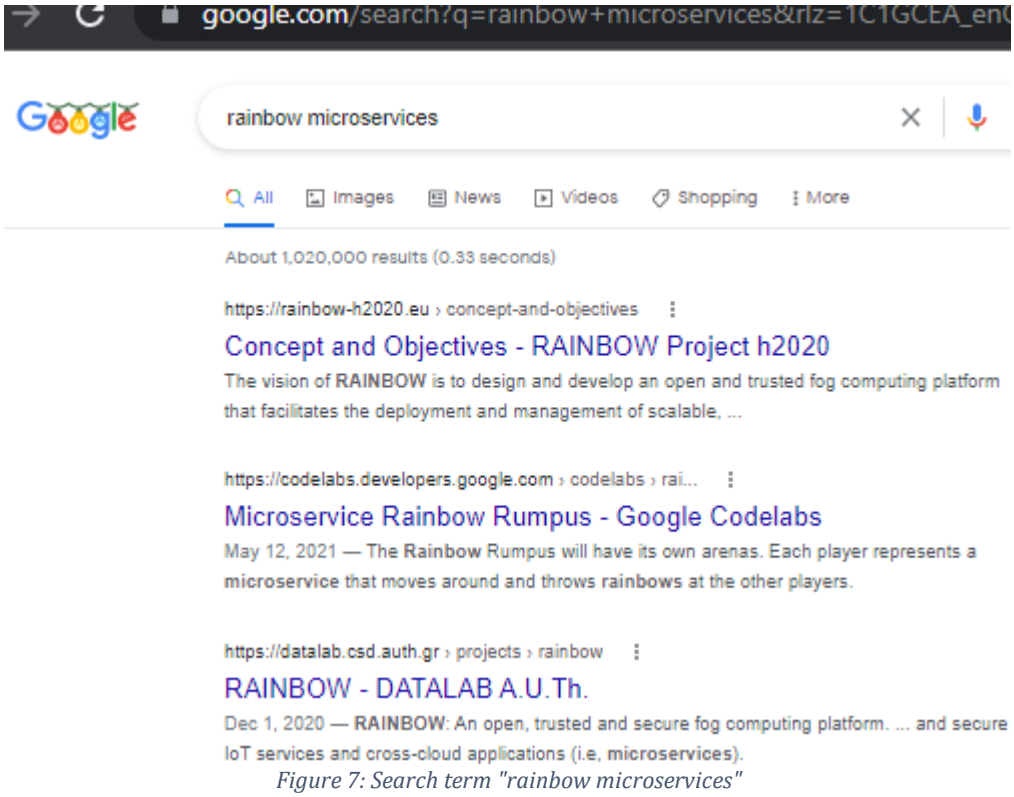


Figure 7: Search term "rainbow microservices"

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.

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 Value	Achieved Value
Number of unique visitors	**5000**	**6,860**
Average duration of visits	**2 min**	**02:18**
Number of page views	**10000**	**29,818**

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

Figure 8 highlights some of the statistics of the website for the first half of the project. From M3 until M36, the RAINBOW website has been visited 29,818 times by 6,860 unique users who, on average, spend 2 minutes 18 seconds in RAINBOW website. These numbers are in line with the foreseen KPIs, as shown in *Table 5*.

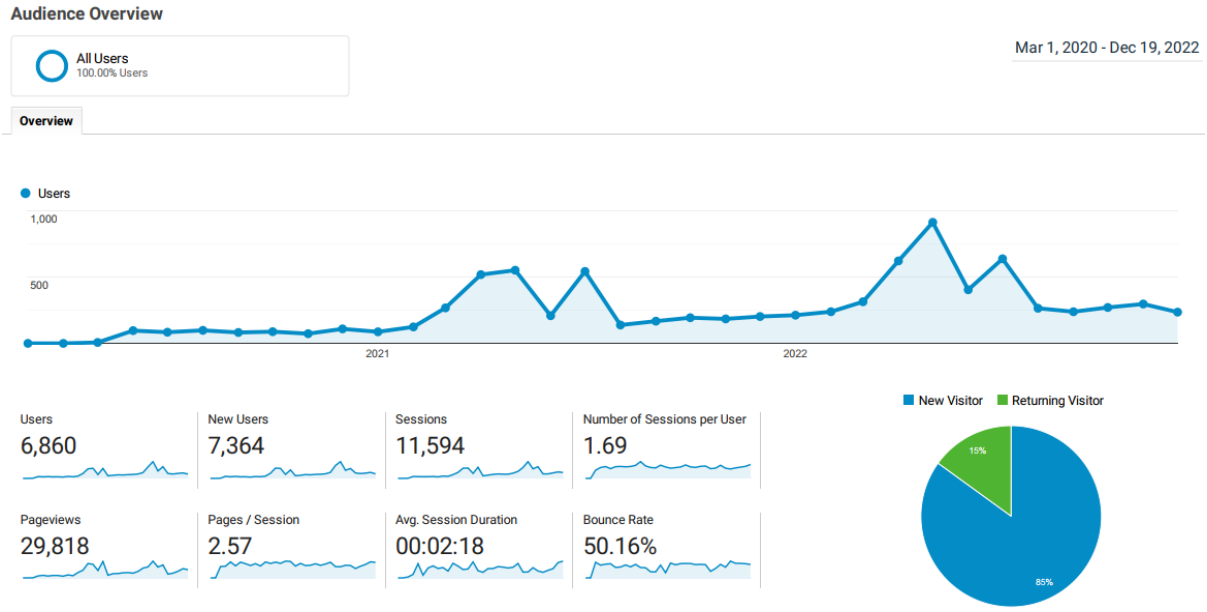
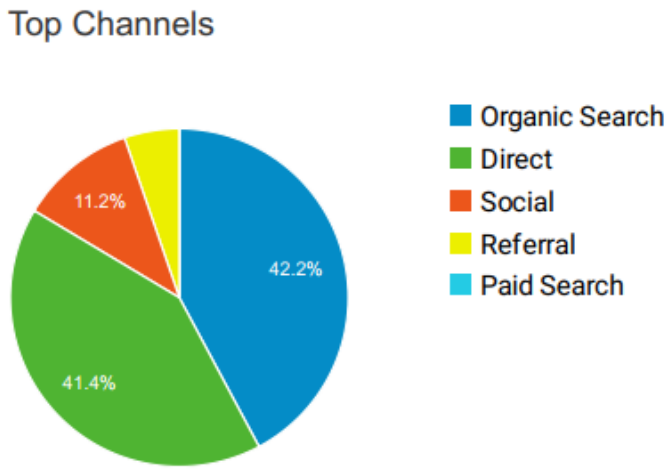


Figure 8: RAINBOW Website Statistics Overview

The average user of the website sees 2,5 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 50.16%, which is generally a roughly average number.
Most of the RAINBOW website visitors are new (85%) 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.

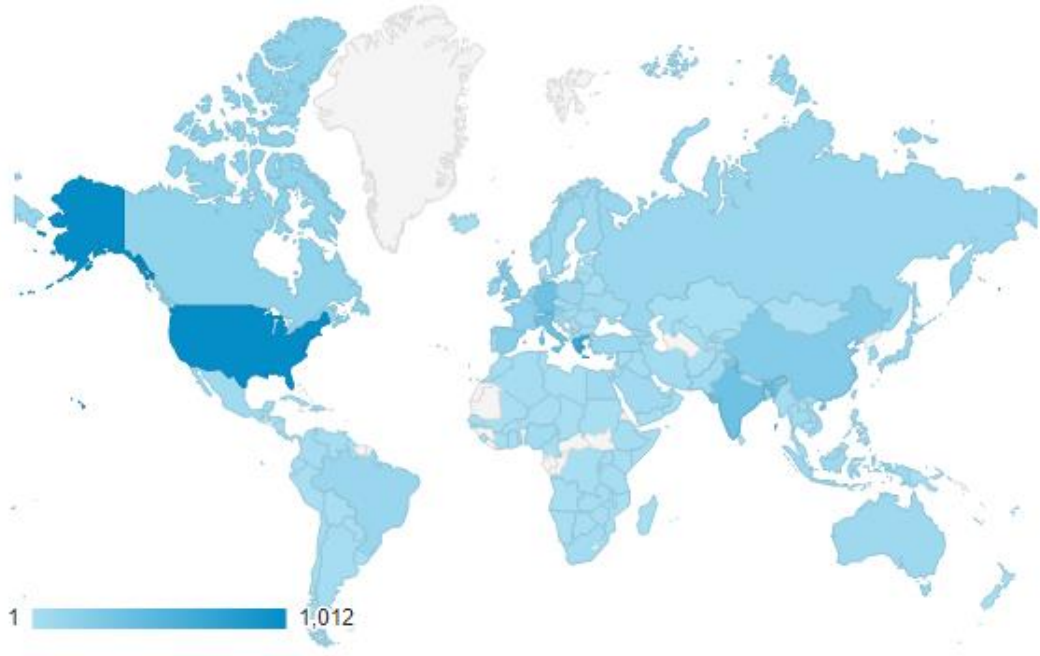
Figure is a screenshot from the **Acquisition overview** menu and provides a summary of the channel sources of our visitors. The majority of our visitors (42.2%) reached the website by *"Organic Search"*, meaning that they found our website through search engines. The second source of generated traffic comes directly from visitors that type the website URL or click their bookmark (*"Direct-41.4%"),* while the third source of incoming visitors is clicks of the website link from social media (11.2%) and third-party websites (*"Referral-5.2%").* The fact that the organic search precedes other sources indicates the efficiency of the website's Search Engine Optimisation (SEO) that has been deployed.



	Acquisition			Behavior		
	Users ↓	New Users	Sessions	Bounce Rate	Pages / Session	Avg. Session Duration
	6,860	7,364	11,594	50.16%	2.57	00:02:18
1 Organic Search	3,094			54.71%		
2 Direct	3,035			47.17%		
3 Social	820			49.22%		
4 Referral	384			44.68%		
5 Paid Search	1			100.00%		

Figure 12: RAINBOW website acquisition overview

Figure 9 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 United States, Greece, India, Italy, Germany, China, United Kingdom, etc.



Country	Acquisition		
	Users ↓	New Users	Sessions
	6,860 % of Total: 100.00% (6,860)	7,369 % of Total: 100.07% (7,364)	11,594 % of Total: 100.00% (11,594)
1. United States	**1,012** (14.53%)	1,033 (14.02%)	1,135 (9.79%)
2. Greece	**670** (9.62%)	672 (9.12%)	2,639 (22.76%)
3. India	**362** (5.20%)	384 (5.21%)	453 (3.91%)
4. Italy	**361** (5.18%)	373 (5.06%)	633 (5.46%)
5. Germany	**355** (5.10%)	359 (4.87%)	447 (3.86%)
6. China	**236** (3.39%)	248 (3.37%)	289 (2.49%)
7. United Kingdom	**221** (3.17%)	233 (3.16%)	275 (2.37%)
8. Austria	**200** (2.87%)	205 (2.78%)	513 (4.42%)
9. Spain	**194** (2.79%)	207 (2.81%)	287 (2.48%)
10. Cyprus	**171** (2.46%)	167 (2.27%)	470 (4.05%)

Figure 9: 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 months 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 Value	Achieved Value
Number of accumulative followers	**750**	**1,191**
Number of accumulative posts	**1,000**	**1,227**
Number of interactions	**250**	**>250**

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

Related to final status of KPIs Targets of Communication Mechanism 2 (*Table 6*), for all active social media channels, the number of accumulative followers in total is 1191. The number of accumulative posts is 1227. Since M18, the accumulative posts from 205 reached the number of 1227. At this point, it is worth emphasizing the contribution of the consortium to the achievement of this crucial goal. 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 313 followers as illustrated in the next figure. Moreover, the LinkedIn social media channel published 349 posts. LinkedIn provides an analytics functionality, that gives a deeper insight of user activities and the impact that posts have to followers.

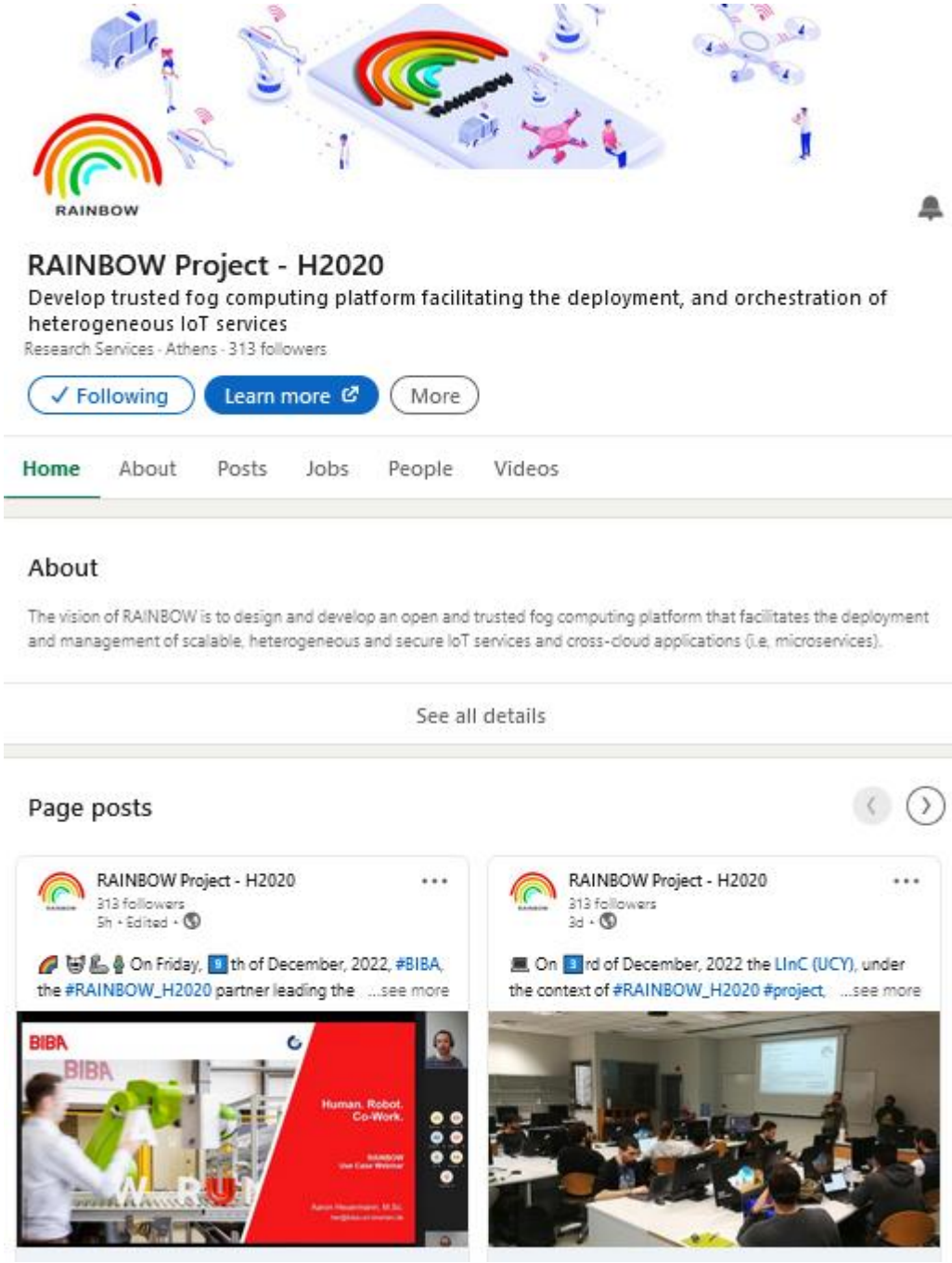


Figure 10: RAINBOW LinkedIn page

Figure 11 provides an overview of visitor's metrics from M24 to M36. 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).

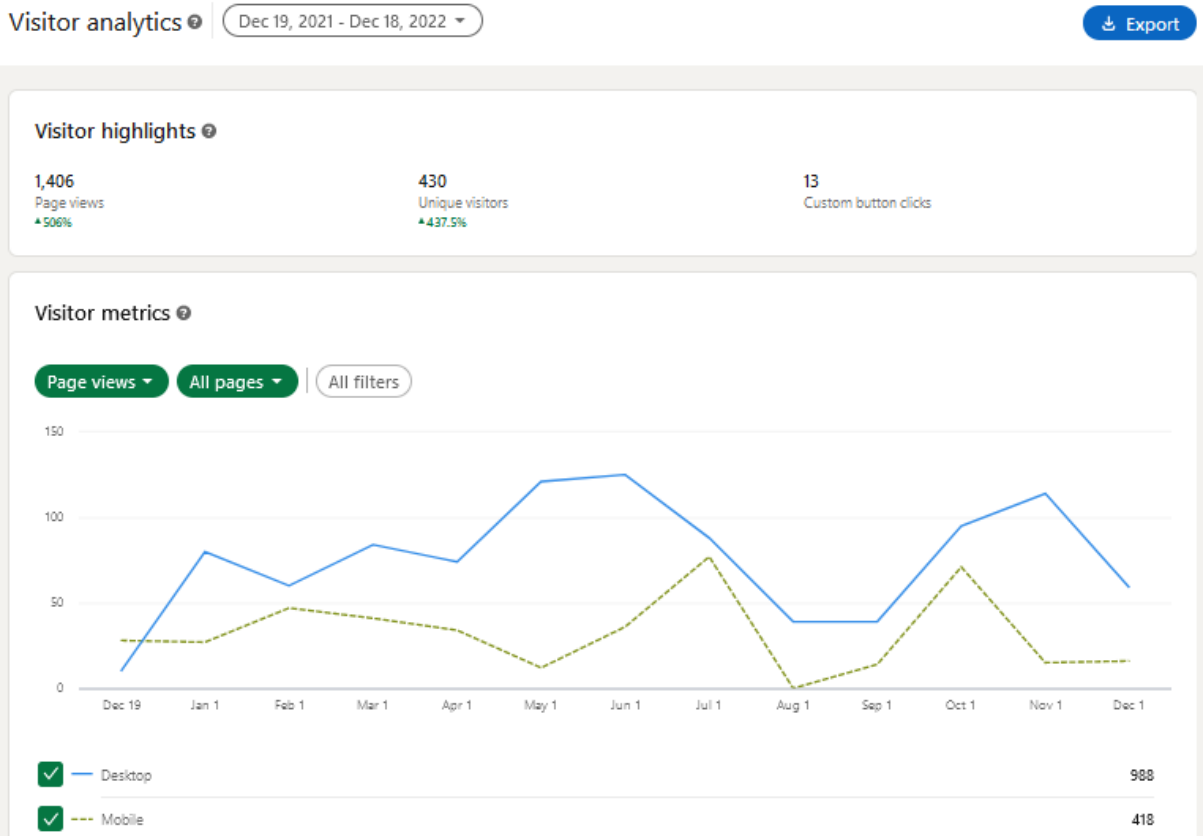


Figure 11:LinkedIn visitors' overview

Figure 12 displays the number of interactions (likes, shares, clicks, comments) that were observed in the RAINBOW LinkedIn page from M24 to M36

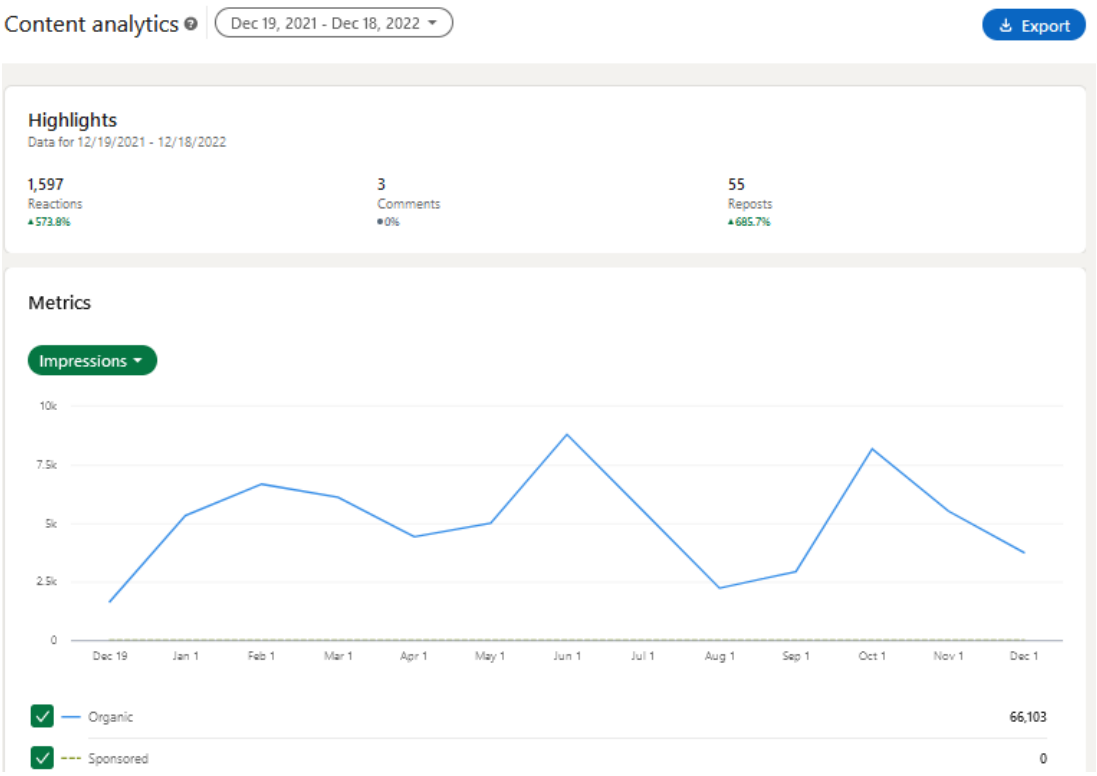


Figure 12: LinkedIn updates overview

4.2 Twitter

Until the M36, 433 tweets were made while the project account (https://twitter.com/RainbowH2020) has 534 followers as illustrated in the *Figure 13.*

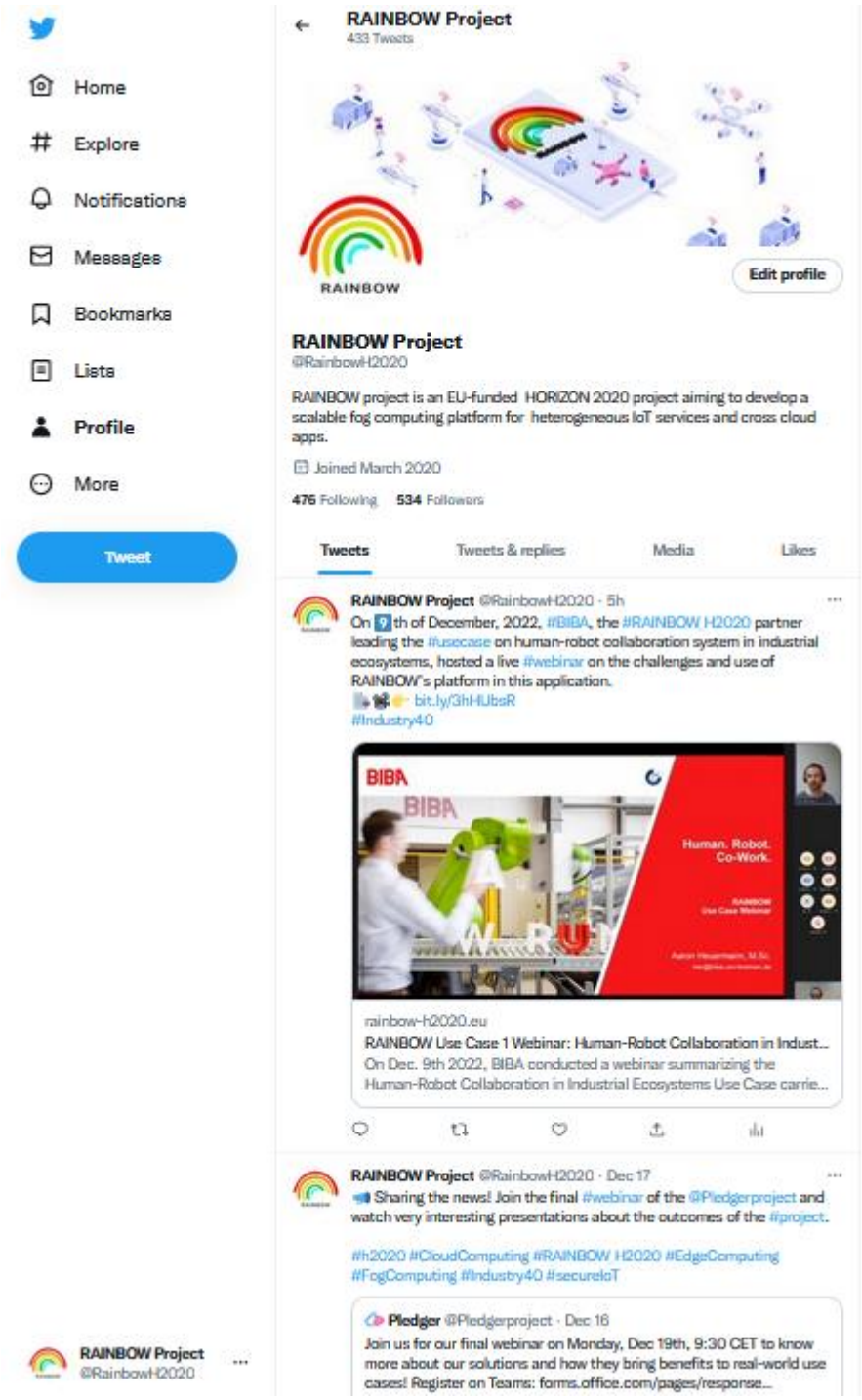


Figure 13: RAINBOW Twitter Account

The analytics are presented in the following figures (*18-27*). 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, from M15-M18 16.1k., from M18-M21 18.8k., from M21-M24 12.2k., from M24-M27 9.5k., from M27-M30 7.5k., from M30-M33 5.6k. and finally for the period M3-M36 5.7k impressions were counted. So in total of the twenty-one-month period M6-M36 we had an overall of 94.6k impressions.

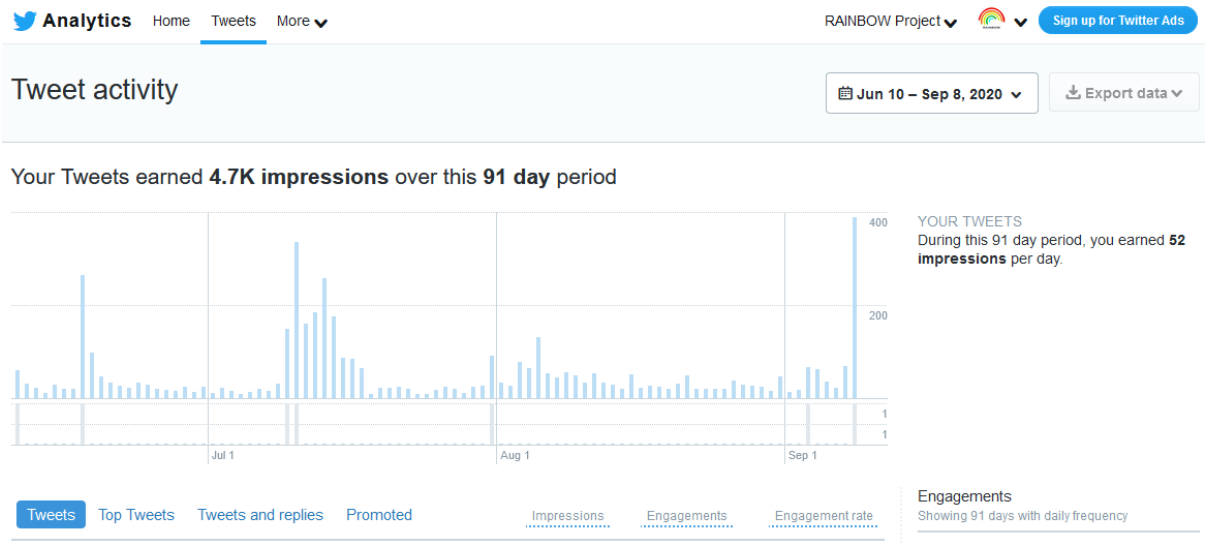


Figure 14: Twitter Statistics M6-M9

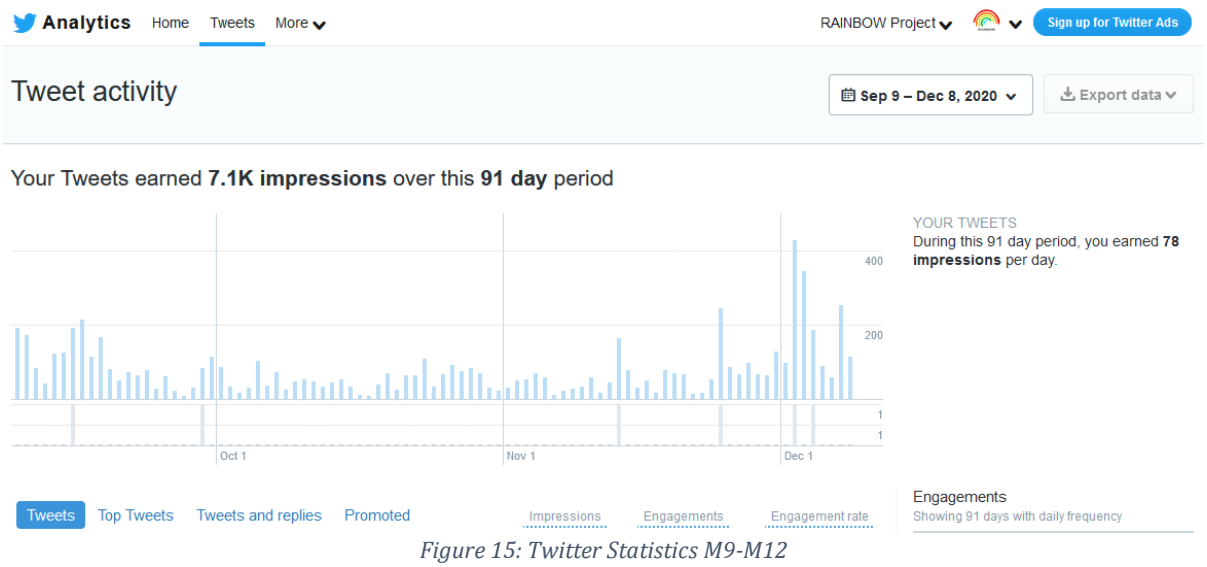


Figure 15: Twitter Statistics M9-M12

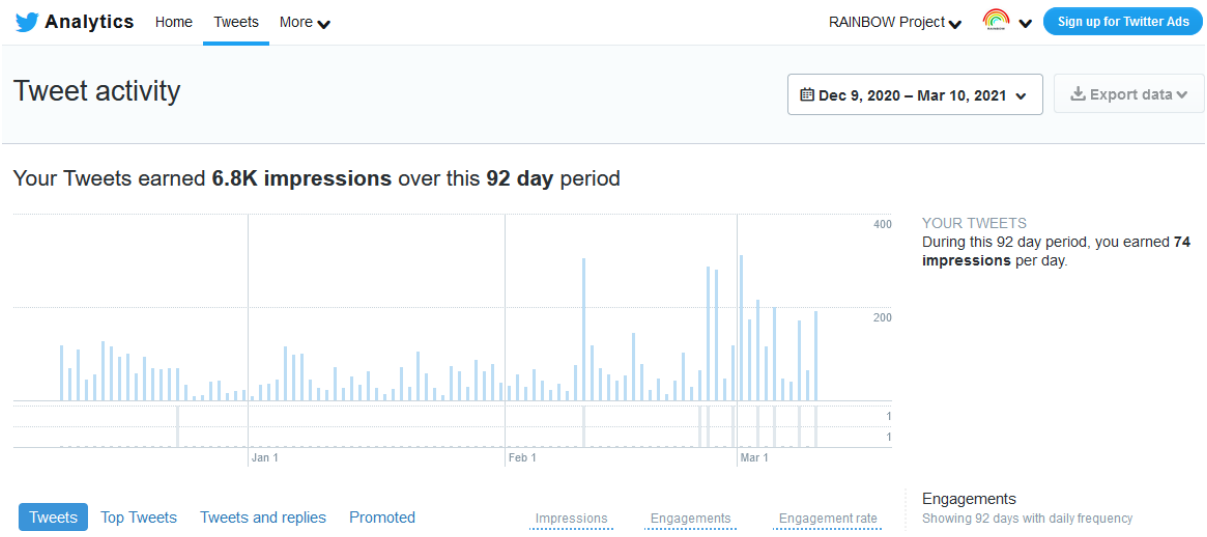


Figure 16: Twitter Statistics M12-M15

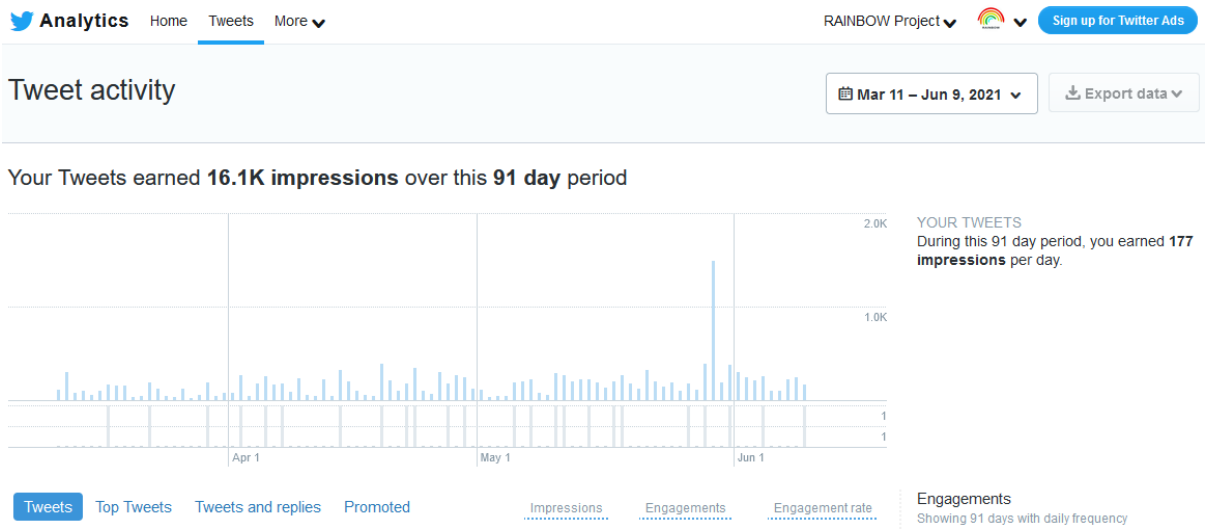


Figure 17: Twitter Statistics M15-M18

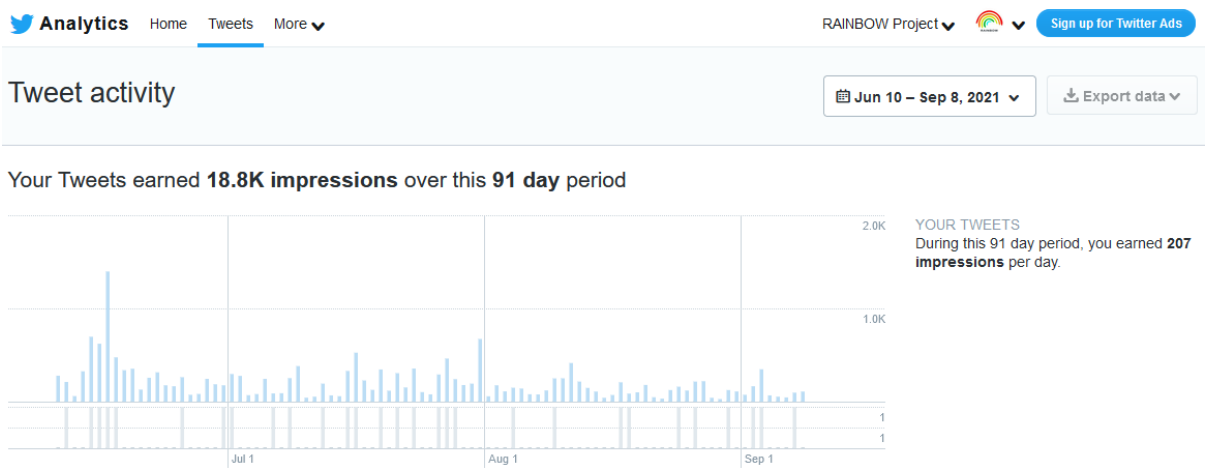


Figure 18: Twitter Statistics M18 – M21

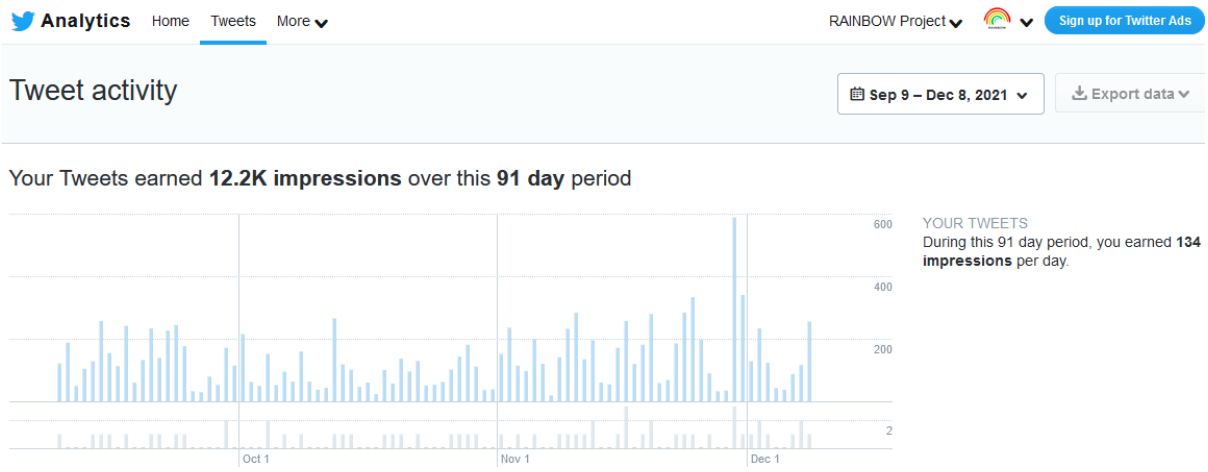


Figure 19: Twitter Statistics M21-M24

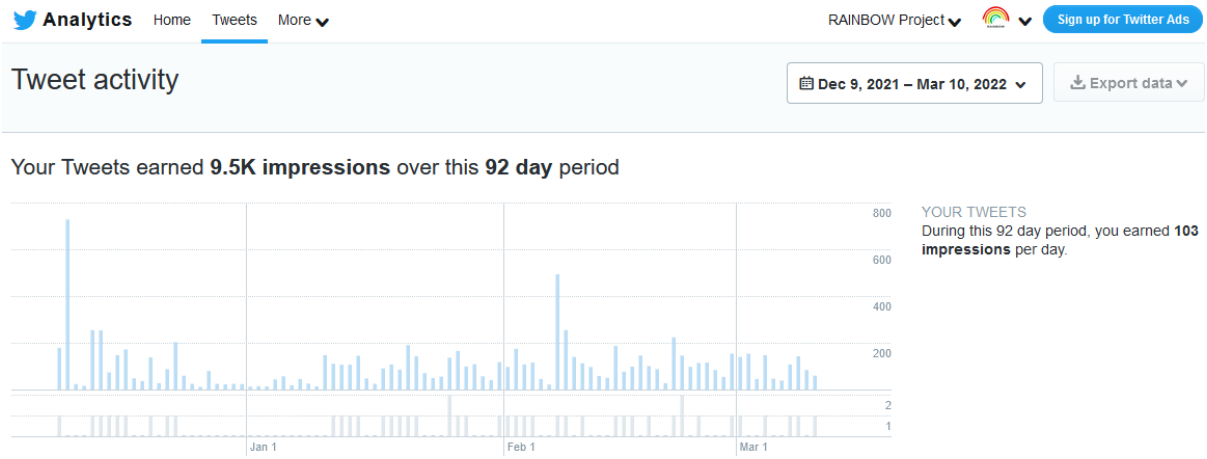


Figure 20: Twitter Statistics M24-M27

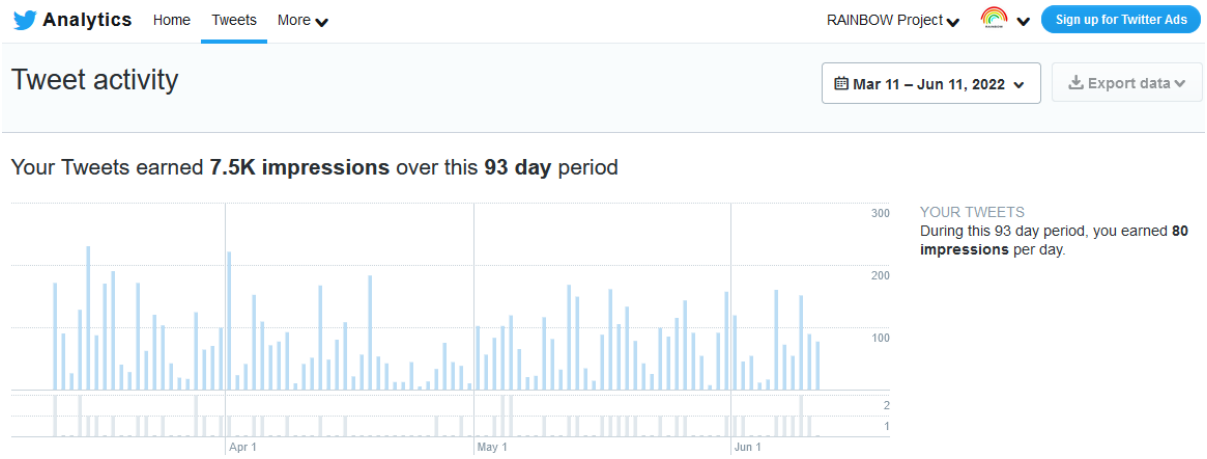


Figure 21: Twitter Statistics M27-M30

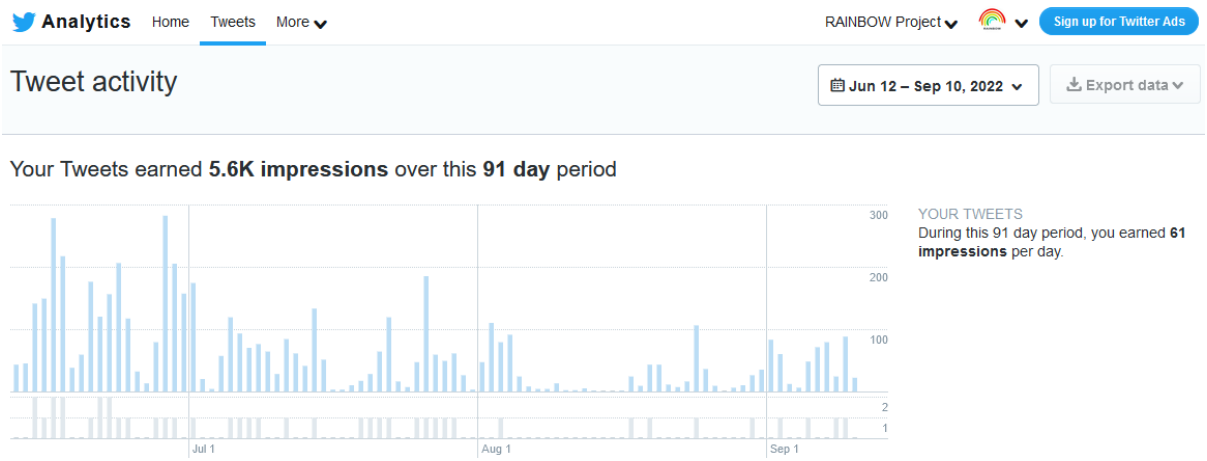


Figure 22: Twitter Statistics M30-M33

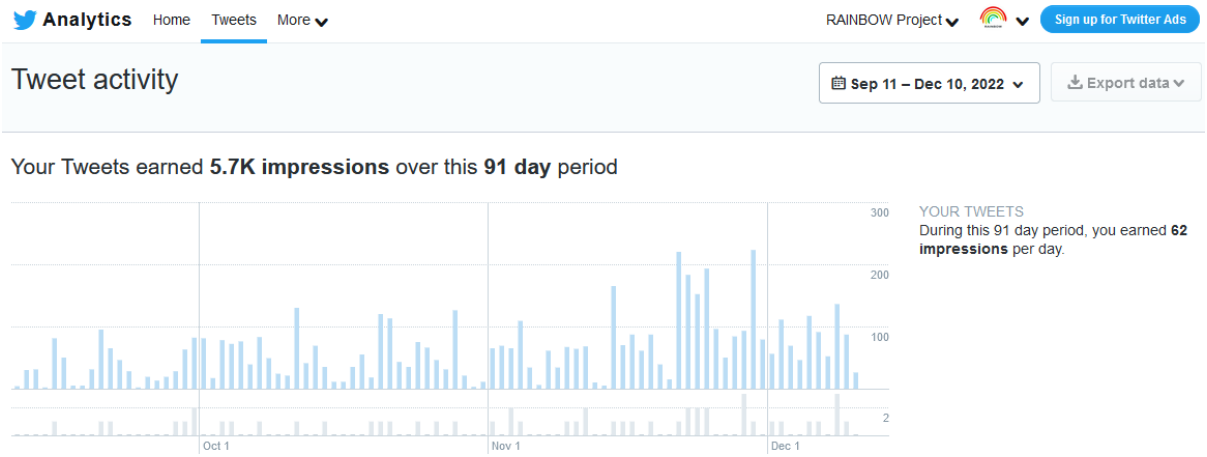


Figure 23: Twitter Statistics M33-M36

4.3 Facebook

Figure 24 is a screenshot of the RAINBOW Facebook page (https://www.facebook.com/RainbowProjectH2020). As of M3, the page has reached 158 followers and published 350 posts.
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.

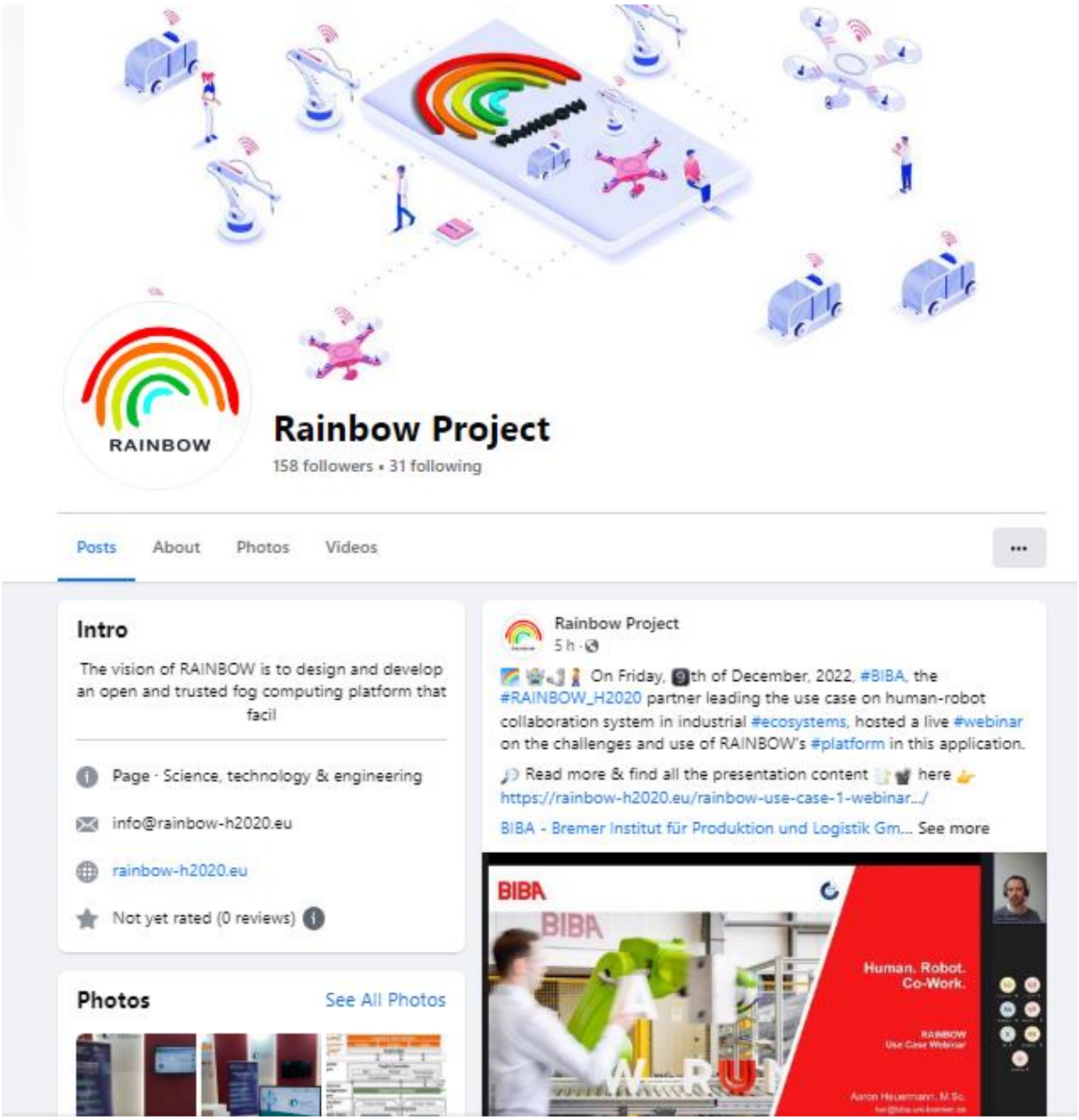


Figure 24: RAINBOW Facebook page

Figure 25 provides an overview concerning last posts published on Facebook.

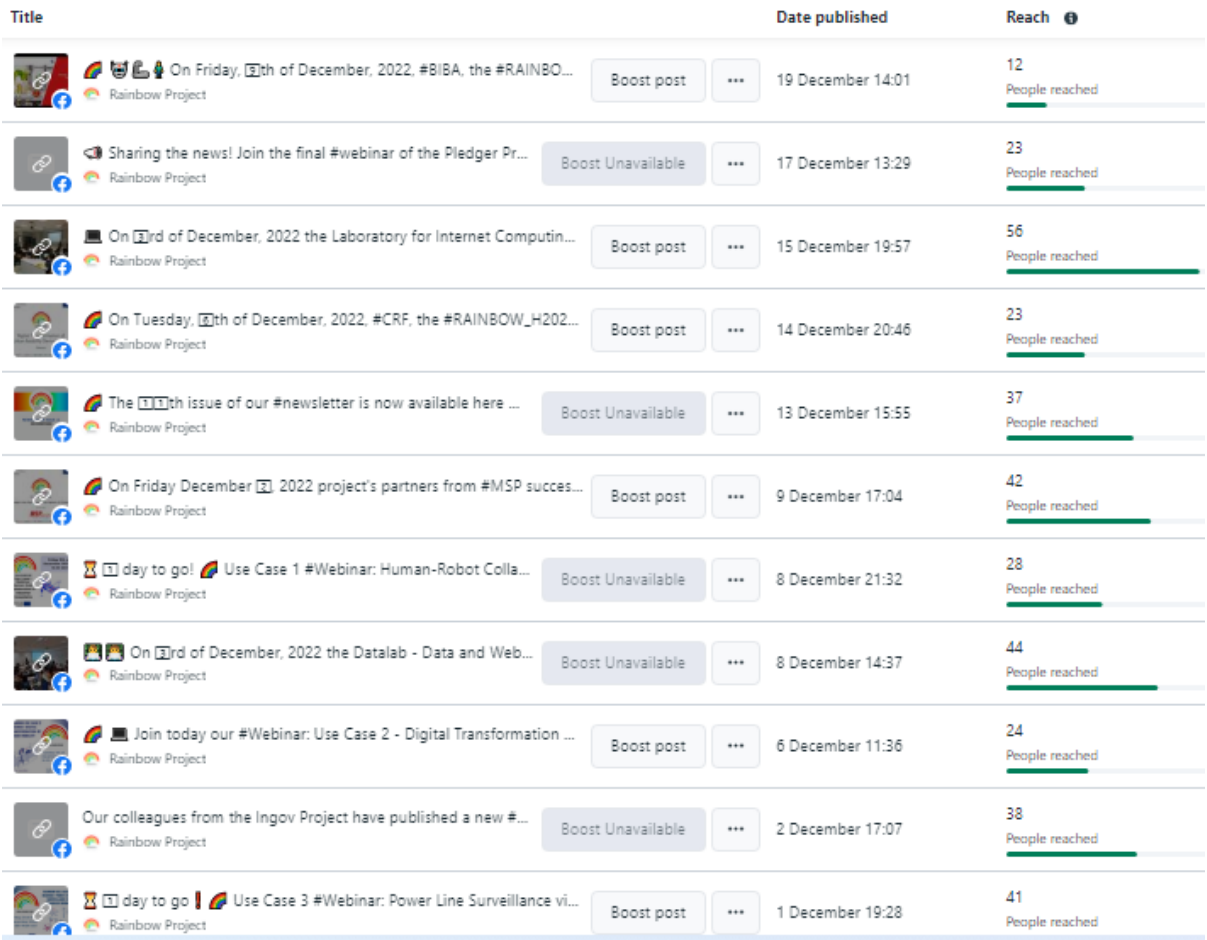


Figure 25: Facebook Posts Statistics

Figure 26 presents an overview on Facebook statistics, and more particularly on Facebook page reach from M25 to M36. It is the number of people who saw any content from or about this page, including posts, stories, ads, social information from people who interact with our page and more. The total number of 2,252 is increased by 19.3% in comparison for the same period concerning second year of the project.

Figure 26: Facebook statistics on post types

4.4 Instagram

The RAINBOW Instagram page was created during M17. On the Instagram account of RAINBOW have been posted important news related to the project such as results, events, achievements, etc. (https://www.instagram.com/rainbow.2020.eu/). The page has 150 followers and published 61 posts.

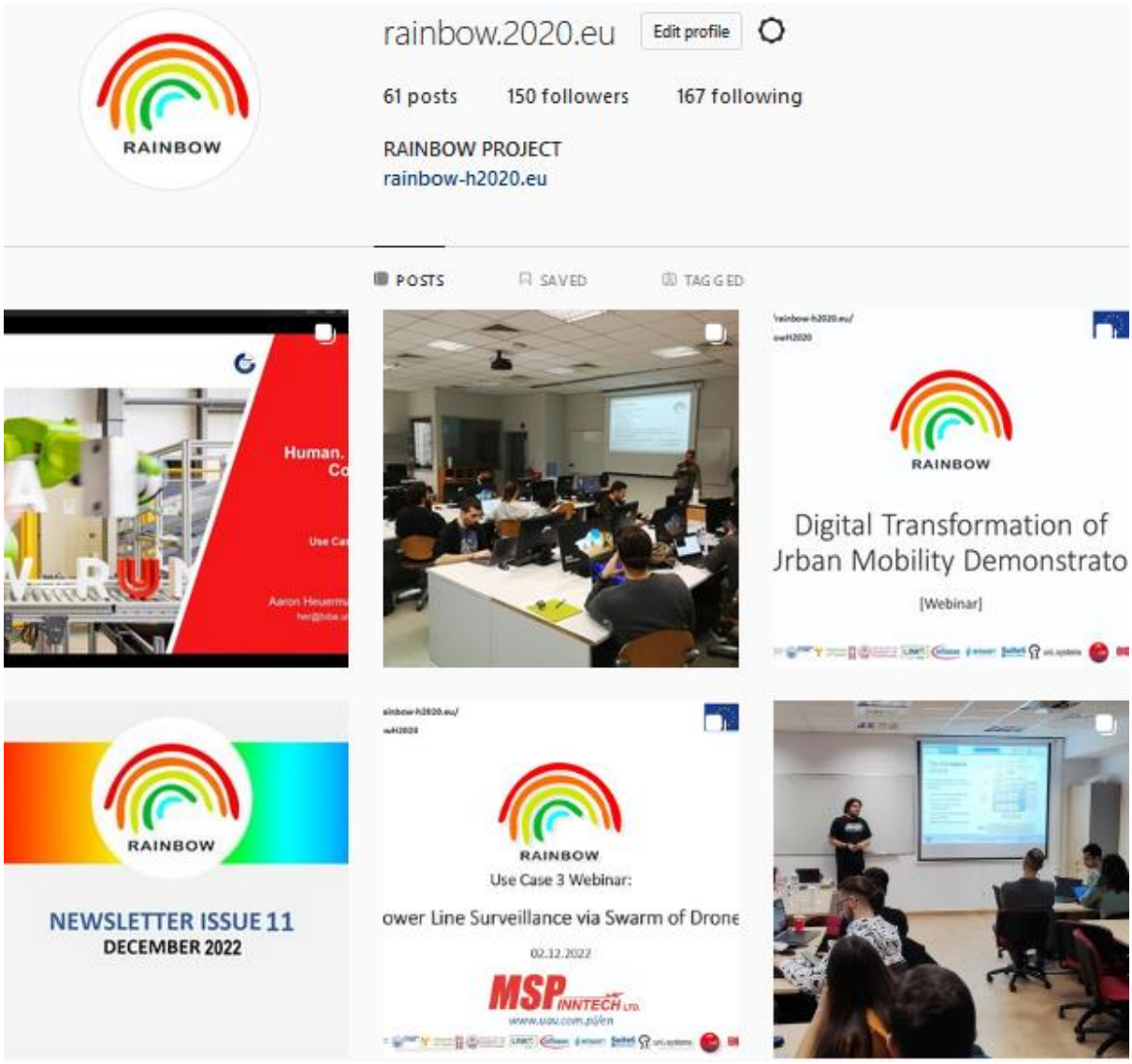


Figure 27: RAINBOW Instagram page

4.5 ResearchGate

ResearchGate is the professional network for scientists and researchers. This account was created in order to increase project's scientific outreach and includes publications

listed on the RAINBOW website. The RAINBOW ResearchGate page was created during M14 and has reached 118 reads.

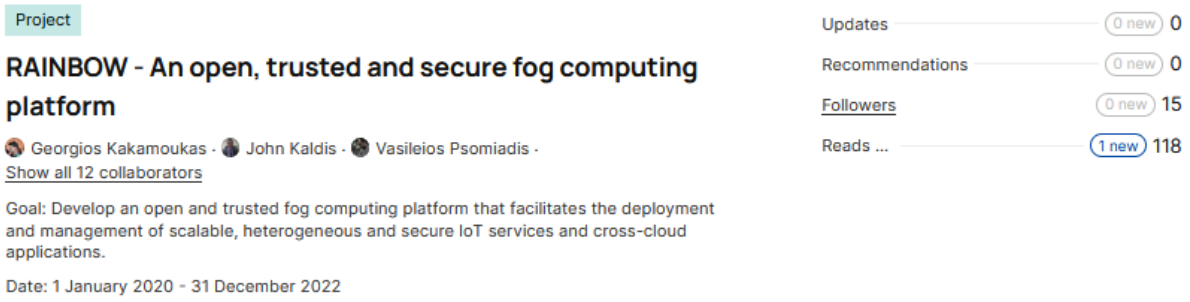


Figure 28: RAINBOW ResearchGate page

4.6 YouTube

The RAINBOW channel on YouTube (https://www.youtube.com/@user-kw4op2xb3k) was created during M17. Three (3) videos covering aspects of RAINBOW (*RAINBOW Approach, RAINBOW Use Cases and RAINBOW: A Fog Computing Platform*) as well as any other related material produced by the RAINBOW project (webinars organised and more). This channel hosts in total 22 videos. Moreover, the channel has had 369 views so far.

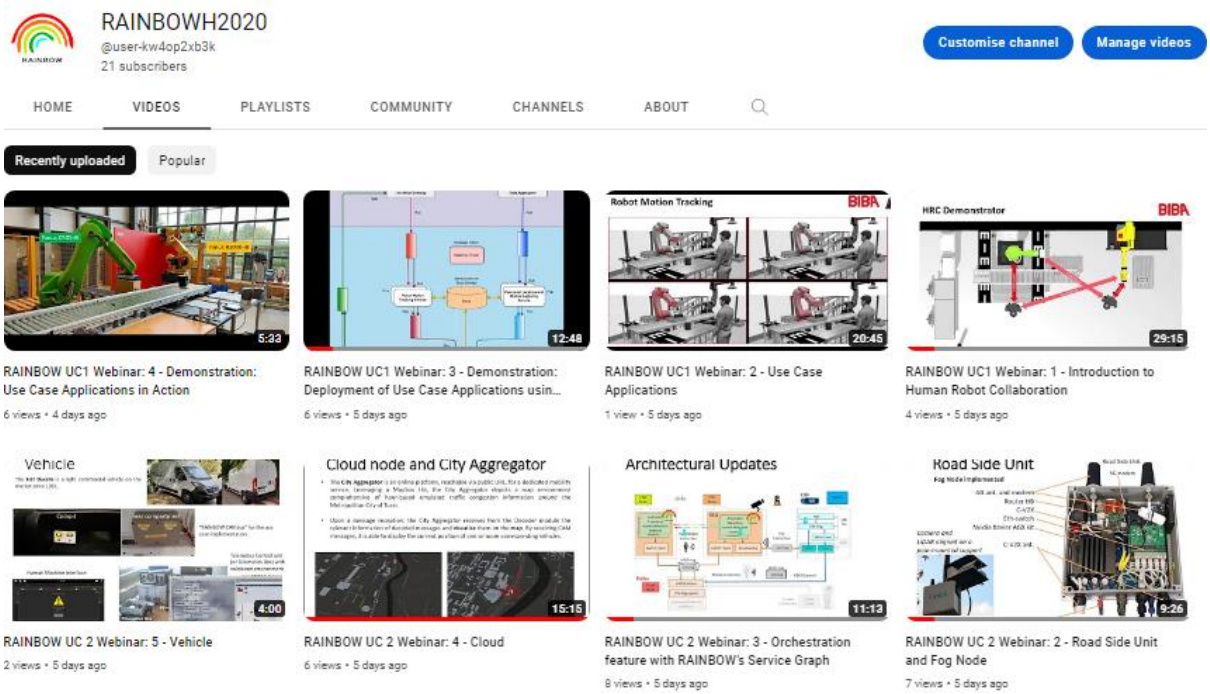


Figure 29: RAINBOW YouTube channel

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 30* and *Figure 31*), as well as online version of the communication material.

Figure 30: Hackathon activity – "Building optimized IoT applications for distributed environments"

Figure 31: RAINBOW participating in the European Big Data Value Forum 2022

Blog posts involve aspects or conventions related to the project, including more extensive descriptions about project achievements and demo versions (*Figure 31*). 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.

Figure 32: Blog post on Human-Robot Collaboration in Industrial Ecosystems Use Case: Reference Scenario

5.1 Roadmap

A first plan for blog posts was introduced by WP7 Leader AUTH in M14, involving monthly publications from partners. The first step of this plan involved 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 was 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 modelling, 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 were three new similar detailed plans involving each partner, with the aim of creating more frequent blog posts publications (every 10 days or every week), in order to achieve the KPI target of 100 blogs. These actions were working in parallel with the blog post publication actions handled by K3Y. As a result, more blog posts published, concerning technical details from the releases of the platform and from the use case demonstrators.

5.2 Blog Posts

The number of posts in the blog section is 109. New interesting content was added regularly in the RAINBOW blog. Our partners provided short technical articles and shared news with regards to the Fog/Edge Computing and research advancements in the European Cloud ecosystem. RAINBOW's consortium contributed on detailed blog posts concerning scientific papers represented the project on conferences and events that the project was hosted or participated (webinars, workshops, hackathons etc.) Additionally, the blog post section provided frequent updates on project progress news through the announcement of newsletters, press releases etc.

The following figures (*Figure 33, Figure 34*) represents only two out of the very interesting blog posts that have been uploaded to the website:

- **High-level Description of the RAINBOW Digital Transformation of Urban Mobility Use Case** (https://rainbow-h2020.eu/high-level-description-of-the-rainbow-digital-transformation-of-urban-mobility-use-case/)

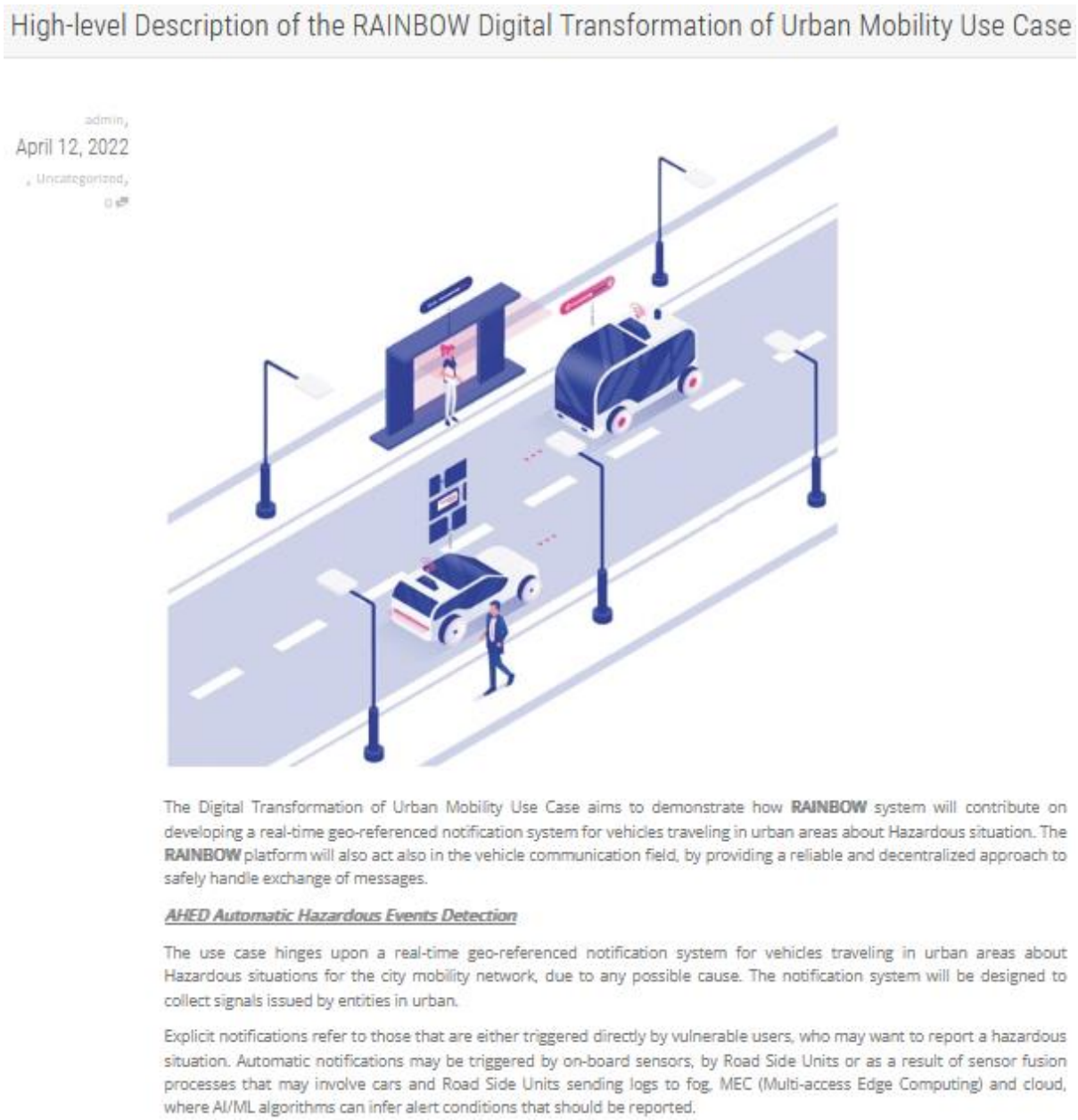
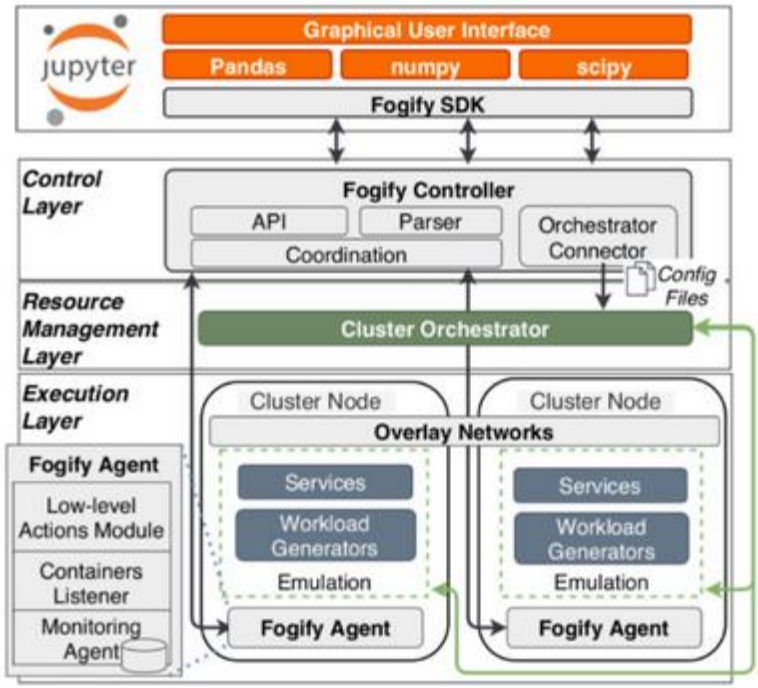


Figure 33: High-level Description of the RAINBOW Digital Transformation of Urban Mobility Use Case

- **Fogify in RAINBOW** (https://rainbow-h2020.eu/fogify-in-rainbow/)

Fogify in RAINBOW

admin,
December 2, 2021
, Uncategorized,
0



A Fog Computing ecosystem consists of actors that range from IoT developers and academic researchers to Fog operators. All fog-related users would like to explore Fog capabilities, though they face new challenges in such a complex environment. For instance, IoT developers and researchers wish to evaluate their applications in Fog environments and analyze their performance metrics. Furthermore, Fog operators wish to evaluate different devices, but this could be costly due to the wide range of options and time-consuming due to their configuration.

Acknowledging and facing all these issues during the development process of the Rainbow Project, we implemented Fogify, a Fog Computing emulation framework. Fogify facilitates modeling, deployment, and experimentation of fog testbeds. Specifically, it provides a toolset to model complex fog topologies comprised of heterogeneous resources, network capabilities, and QoS criteria; deploy the modeled configuration and services using popular containerized infrastructure-as-code descriptions to a cloud or local environment; experiment, measure and evaluate the deployment by injecting faults and adapting the configuration at runtime to test different "what-if" scenarios that reveal the limitations of service before introduced to the public. Watch the demonstration of Fogify here.

Figure 34: Fogify in RAINBOW

6 Traditional Media

The RAINBOW project has issued several **press releases** to highlight the milestones of the project and to announce significant events and developments. Their distribution has been geared towards achieving wide press and media coverage about the project. The RAINBOW project was issued 13 press releases. These press releases were published in all project's communication channels and also circulated by partners to their business networks and media contacts. Also, they have been sent for publication to various local, European and international information providers (e.g. journalists, websites, magazines, electronic newspapers etc.) to maximize their reach and impact.

6.1 Press Releases

The last press release was issued during M35 (*Figure 35*).
In general, press releases were issued for videos developed in the context of disseminating the project, on project's platform releases, regarding outcomes on RAINBOW plenary meeting's. Furthermore, press releases were issued related with major events that the project was participated or hosted.

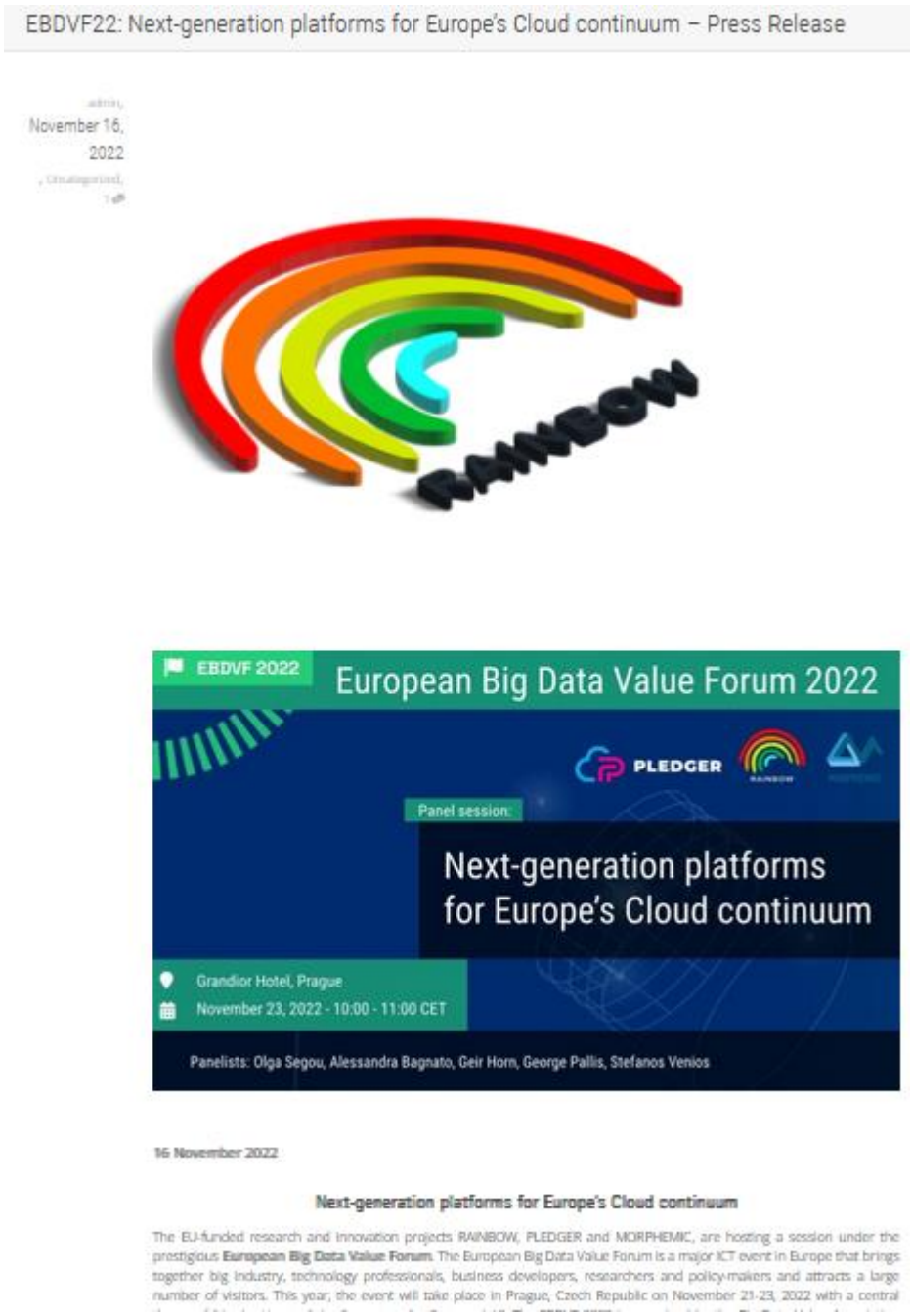


Figure 35: Press Release on EBDVF22: Next-generation platforms for Europe's Cloud continuum

7 Communication Material

AUTH and K3Y prepared some dissemination material, and more specifically, two flyers, two brochures, a banner, a poster and ten e-newsletters. This material was designed and produced in order to communicate to the target audience the RAINBOW's approach, open challenges, KPIs, objectives, stakeholders, consortium, use cases and much more. Flyers, brochures, banner, poster 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, in the second half of the project K3Y created 3 videos covering all major aspects of RAINBOW.

7.1 RAINBOW Flyer

On M12 of the project, 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. Due to COVID-19 restrictions there was no physical event where the first 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 36* & *Figure 37*:

Figure 36: RAINBOW Flyer - Page 1

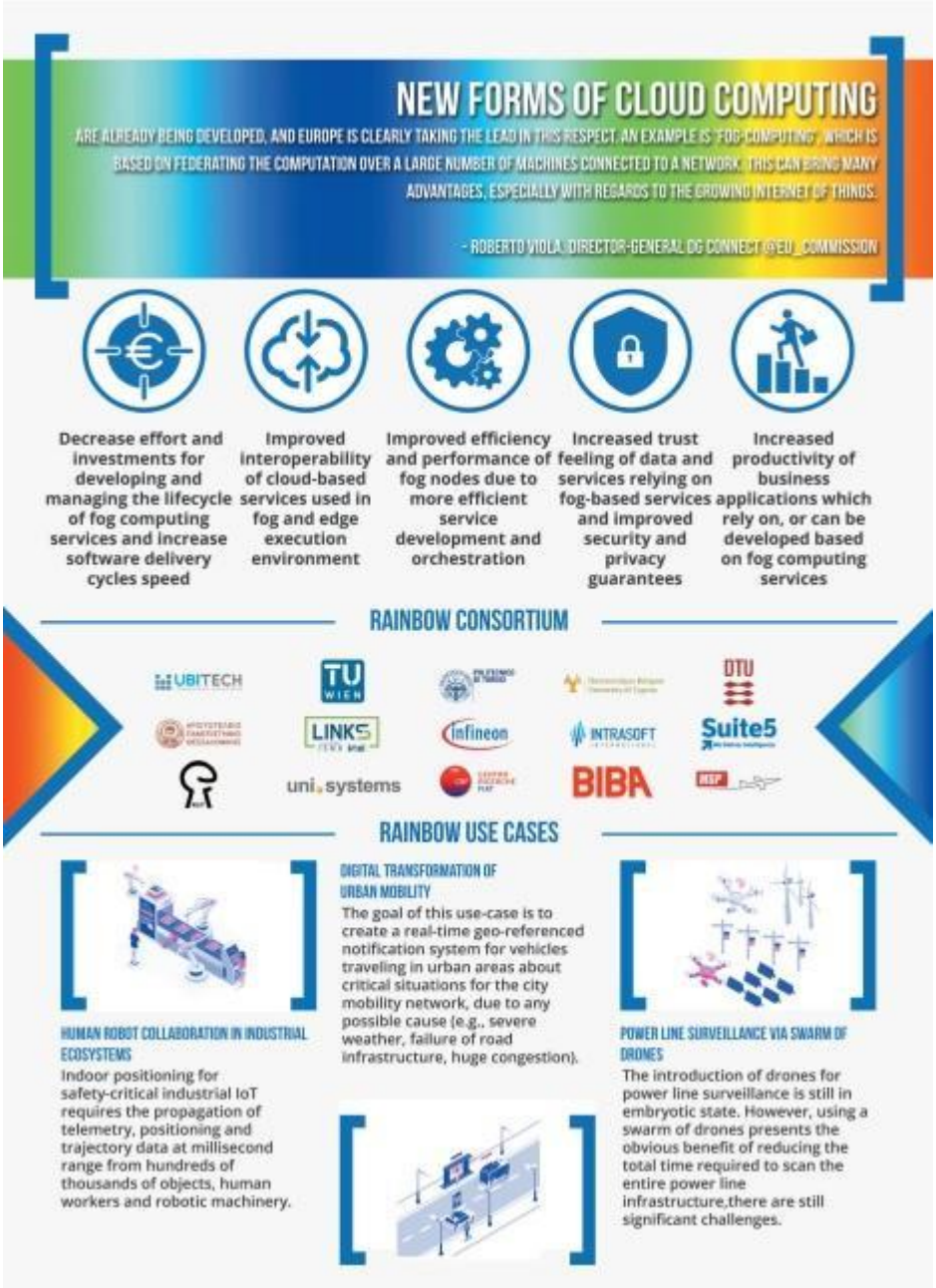


Figure 37: RAINBOW Flyer - Page 2

On M33 of the project, a second version of RAINBOW's flyer was published. This updated version presents among other things the new entries on social media channels, all the latest updates about the project; the 2nd platform release and the early-stage evaluation processes on project's use cases.
The 2nd version of the RAINBOW flyer is presented in *Figure 36* & *Figure 37*:

Figure 38: 2nd RAINBOW Flyer - Page 1

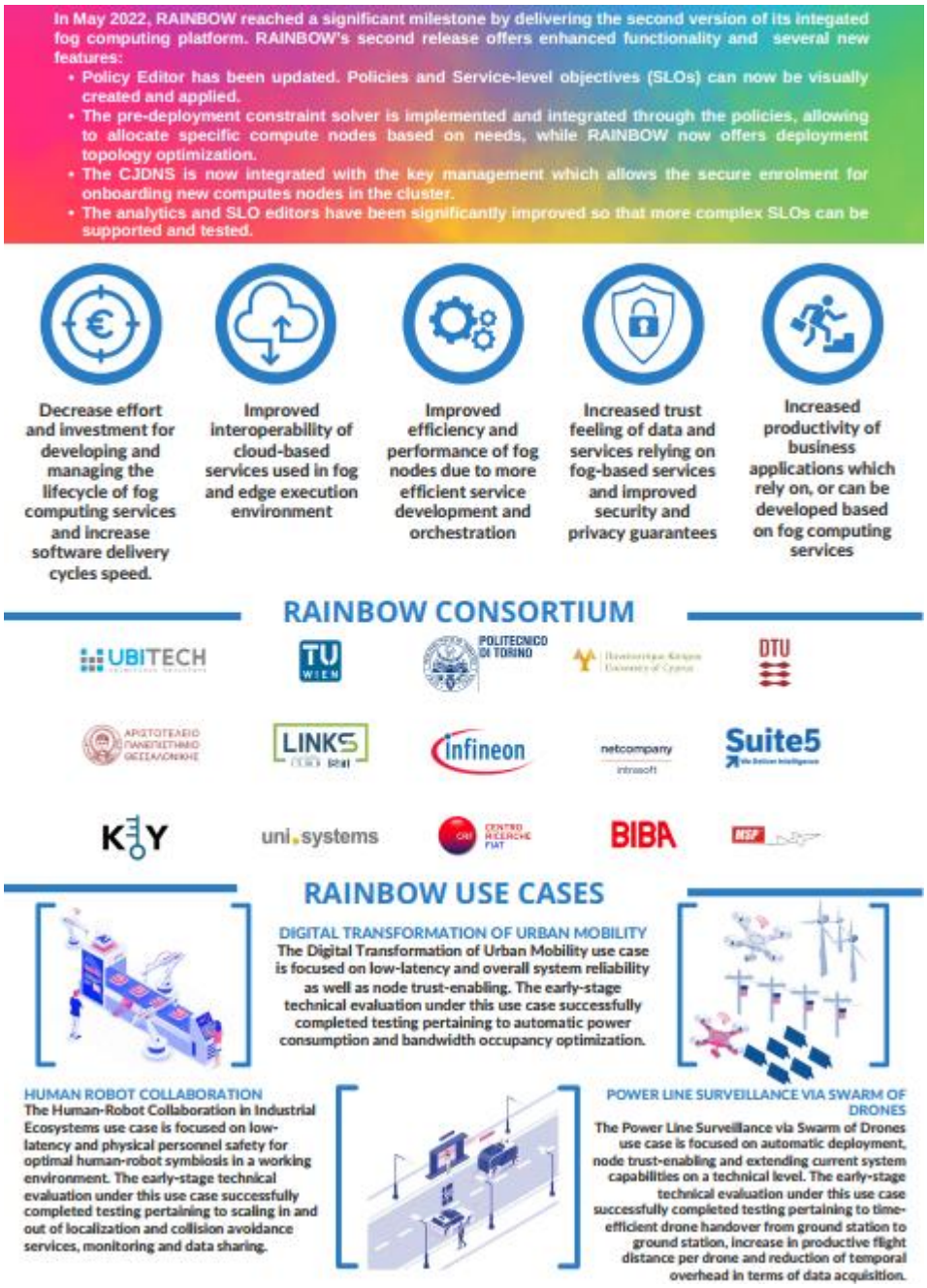


Figure 39: 2nd RAINBOW Flyer - Page 2

The flyers are accessible under the promo material page on the project official website (https://rainbow-h2020.eu/promo-materials/).

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 44-46*. It provides information contact and project details similar like the RAINBOW flyers, the objective of each use case, RAINBOW KPIs, RAINBOW consortium and RAINBOW objectives.

Figure 40: RAINBOW Brochure - Page 1

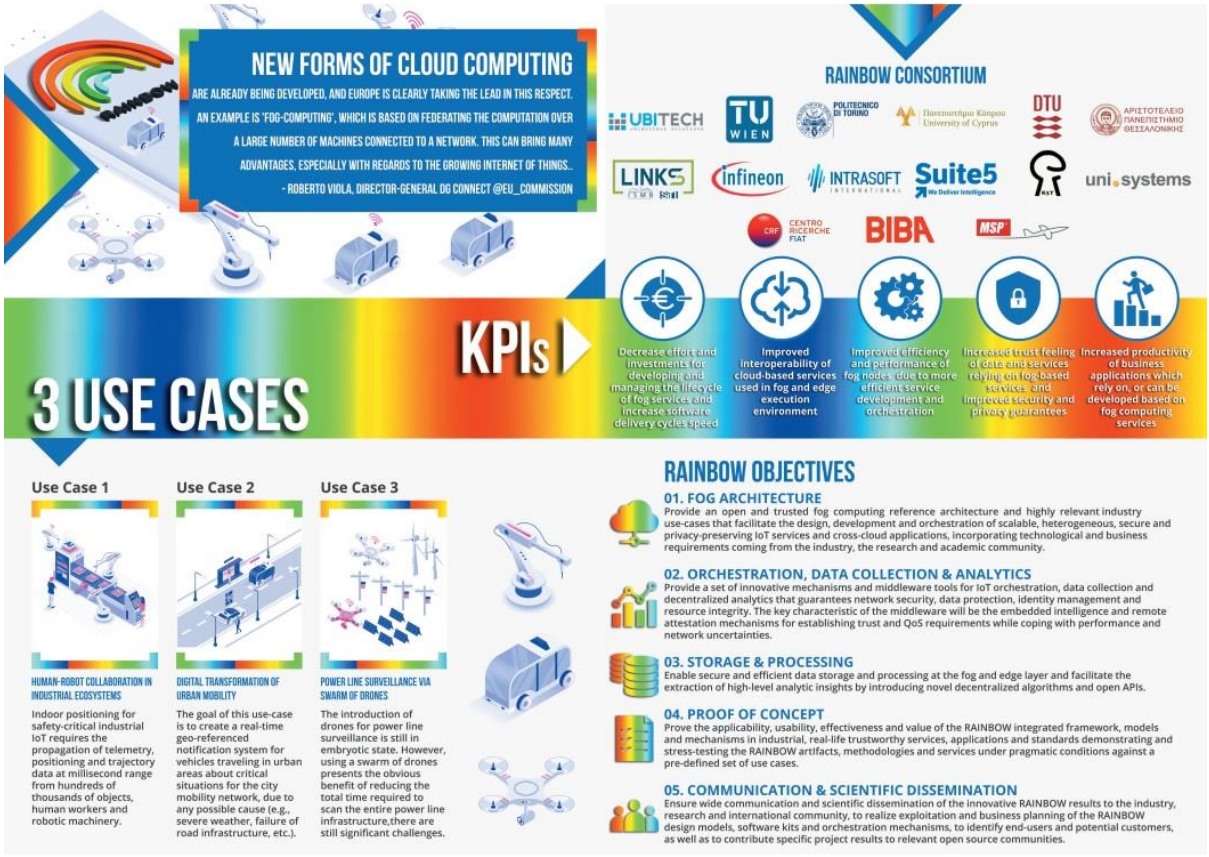


Figure 41: RAINBOW Brochure - Page 2

Figure 42: RAINBOW Brochure - Page 3

On M33 of the project, a second version of RAINBOW's brochure was published. This updated version (*Figures 47-49* presents significant changes: the new entries on social media channels, all the latest updates about the project; the 2nd platform release and the early-stage evaluation processes on project's use cases.
During the 8th plenary meeting of the project on the 20th and 21st of October 2022, in Nicosia, Cyprus, the 2nd brochure was printed and disseminated by K3Y to the consortium. Afterwards, partners used this material on physical events such as hackathon activities, workshops, exhibitions, forums, etc.

Figure 43: RAINBOW 2nd Brochure - Page 1

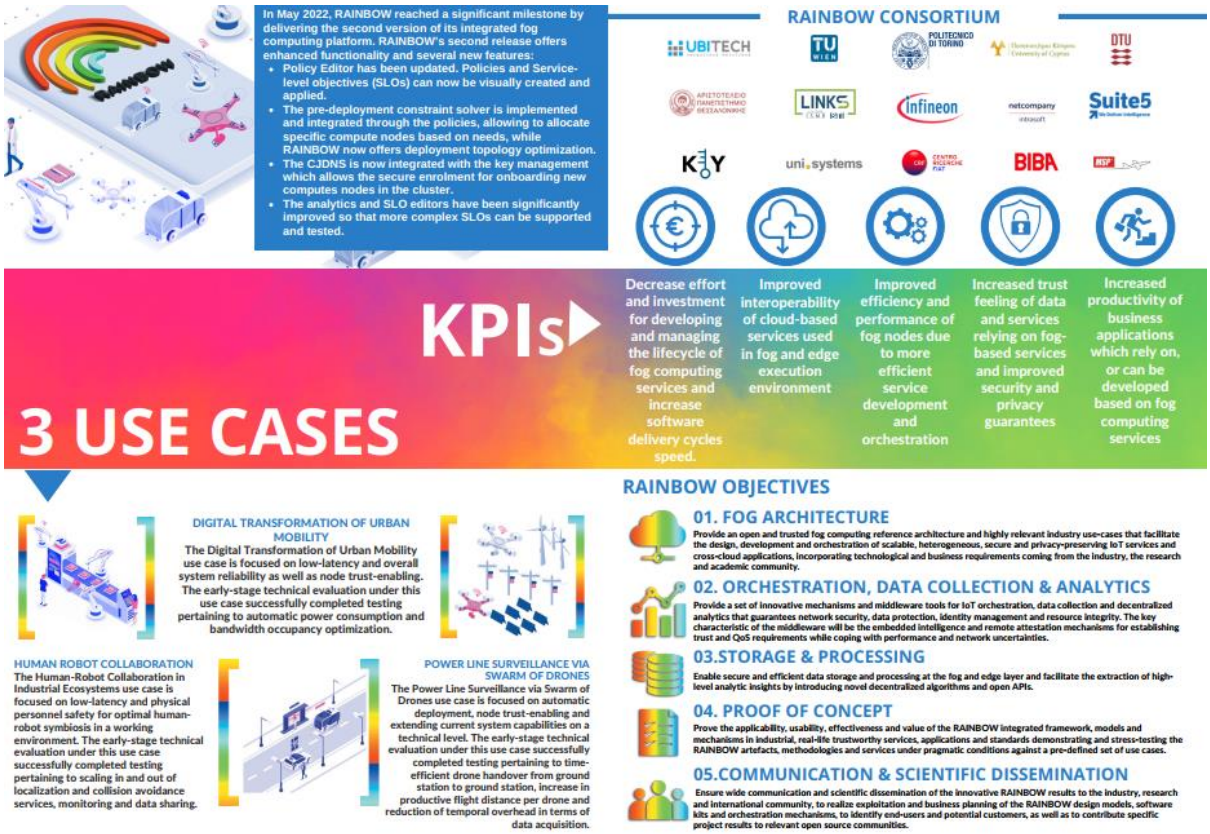


Figure 44: RAINBOW 2nd Brochure - Page 2

Figure 45: RAINBOW 2nd Brochure - Page 3

The brochures are also available under the promo material page on the project official website (https://rainbow-h2020.eu/promo-materials/).

7.3 RAINBOW Banner & Poster

The RAINBOW banner and poster have been published on M34. The plan was to use this material during the live project events during fall.

The banner (*Figure 50*) presents the market potential of RAINBOW, the project's consortium along with its use cases, useful information regarding the social media channels of the project and more.

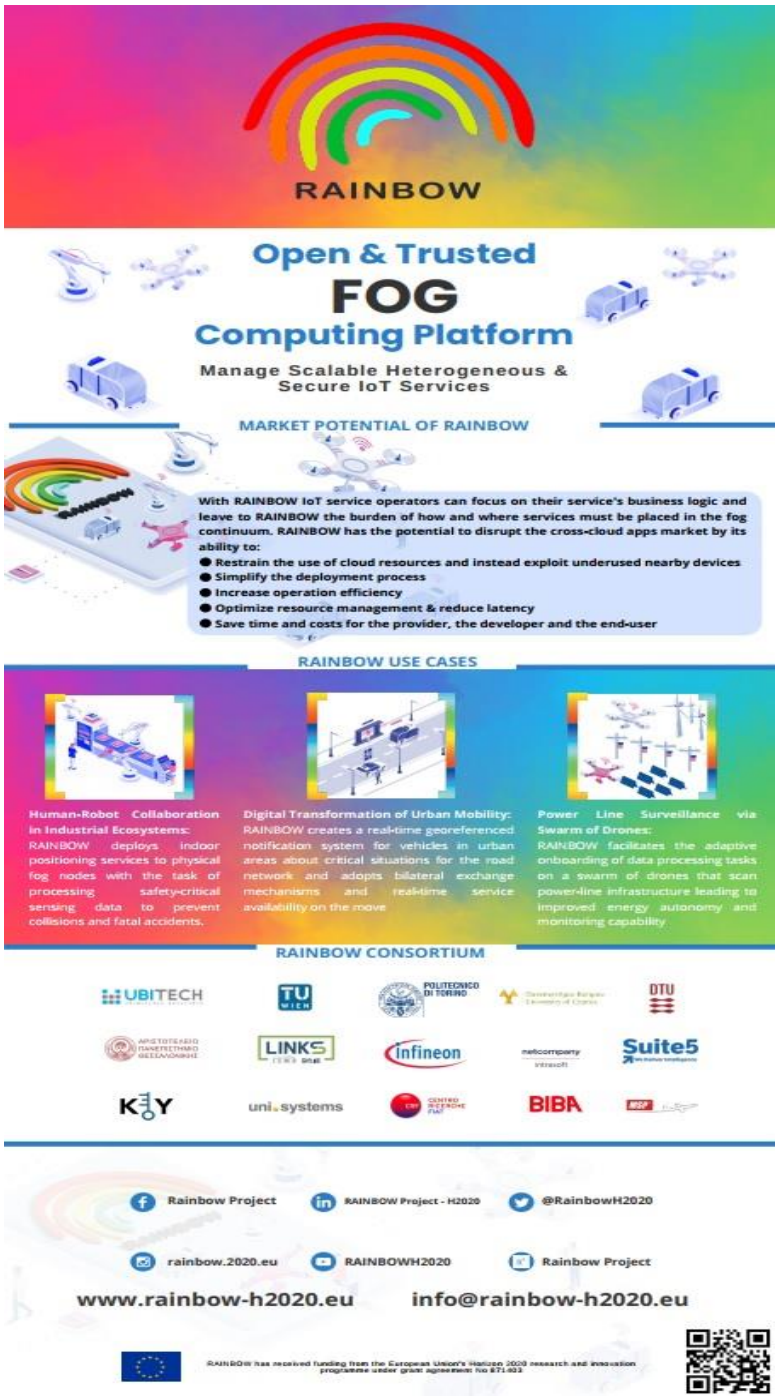


Figure 46: RAINBOW Banner

The banner was used during the successful (physical) 8th plenary meeting that took place in Cyprus (*Figure 51*), in October 2022.

Figure 47: RAINBOW 8th Plenary Meeting in Larnaca, Cyprus (20-21 October 2022)

The RAINBOW poster contains useful information regarding the project such as the market potential of RAINBOW and innovations introduced by RAINBOW. Furthermore, it presents the project's consortium along with its use cases and more. The *Figure 52* below depicts the poster of RAINBOW project.

Figure 48: RAINBOW Poster

The RAINBOW banner and poster are accessible under the promo material page on the project official website (https://rainbow-h2020.eu/promo-materials/).

7.4 RAINBOW e-Newsletter

A plan for delivering twelve e-Newsletters targeted towards the general public was introduced at D7.1. Twelve (12) 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, the fourth in M17, the fifth in M22, the sixth in M24, the seventh in M27, the eighth in M29, the ninth in M31, the tenth in M35 and the eleventh in M36. *Figure 49* & *Figure 50* presents e-Newsletter issues 7 and 10:

Figure 49: RAINBOW e-Newsletter - Issue 7

Figure 50: RAINBOW e-Newsletter - Issue 10

7.5 RAINBOW Videos

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, has been created 3 new videos (based upon the original demo video), each with less than 4-mins duration, with the following content:

- *1st Video – RAINBOW Approach (https://youtu.be/f-1ZDvh8Y0w)*
  This initial production (Figure 8) released during M19. It provides a general introduction, regarding the concept and the targets of the project. More specifically, it presents critical points regarding the RAINBOW project such as:
  - *The philosophy behind RAINBOW's platform*
  - *The vision of RAINBOW project*
  - *What does RAINBOW's offers?*
  - *What are the benefits of the RAINBOW solution?*
  - *In which technological areas RAINBOW will be demonstrated?*

Figure 51: 1st RAINBOW Video (RAINBOW Approach)

- *2nd Video – RAINBOW Use Cases (https://youtu.be/PfUdegKEhWI)*
  This video aims to inform the public about the use cases of RAINBOW. The RAINBOW Fog Computing platform will be evaluated and validated through a set of Use Cases,

inspired by state-of-the-art applications. This production (Figure 8), which released during M28, focuses in describing the three project demonstrators, their challenges and the impact of RAINBOW in each of them:

- *The first Use Case concerns the Collaboration between Humans and Robots in Industrial Ecosystems*
- *The second Use Case regards Digital Transformation of Urban Mobility*
- *The third Use Case is about Power Line Surveillance via Swarm of Drones*

Figure 52: 2nd RAINBOW Video (RAINBOW Use Cases)

- *3rd Video – RAINBOW: A Fog Computing Platform (https://youtu.be/nhWGxcfvUTQ)*
  This video, which released during M36, describes the platform and the components/services that includes.
  RAINBOW platform has been materialized through a multi-layer architecture where each layer comprises a set of discrete components that interact with each other, while five distinct roles are identified as key actors (Orchestration Layer, Modeling Layer and Dashboard Components, Data Management & Analytics Layer, Edge Stack) in the RAINBOW ecosystem and presented through this production. Furthermore, this video (Figure 8), provides the functionality of the platform through a use case scenario.

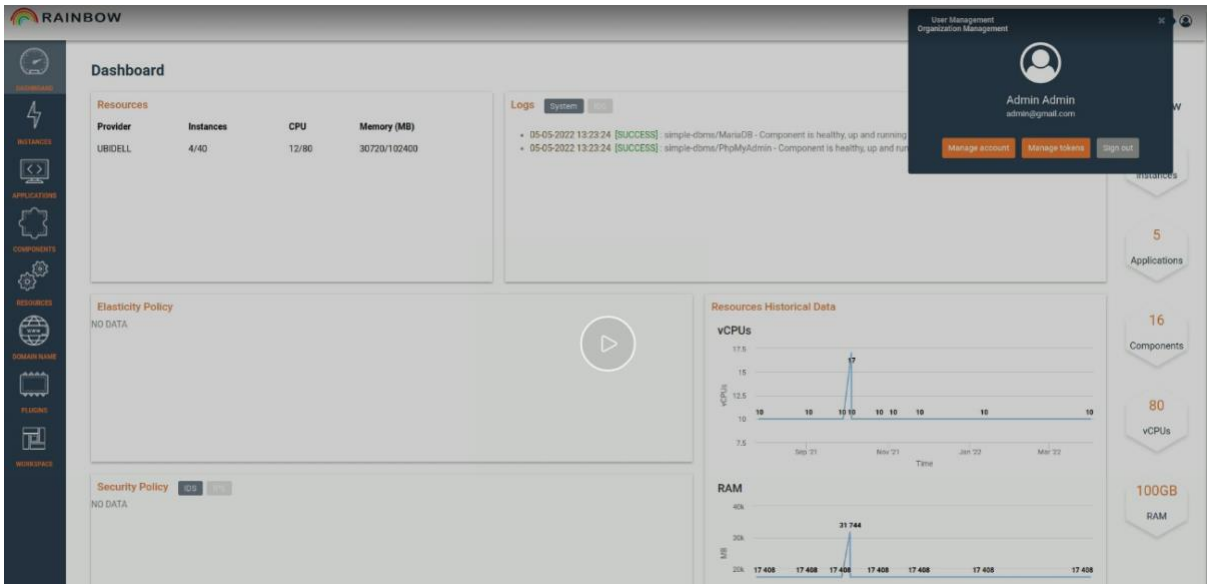


Figure 53: 3rd RAINBOW Video (RAINBOW: A Fog Computing Platform)

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

8 Conclusions

This deliverable presented the communication activities that took place during the whole duration of the project. As expected, project communication activities increased during the second half of the project. Those are highly focused on the platform releases. Moreover, those activities were 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 focused on communicating the Webinars and Workshops that RAINBOW project organised or participated to.

As a result, the visit duration and all numbers regarding website statistics and social media followers have been improved rapidly after M18. Regarding the blog posts as well as the posts on the social media channels of the project, they exceeded the goals that were set. More specifically, blog posts exceeded 100, while social media posts exceeded 1000, with a large contribution from project partners. For this purpose, corresponding related plans were issued during the project which contained clear schedules per partner, with more frequent rates during the second half of the project. Concerning the traditional media, the strategy was the issuing of press releases about every major issue related to the project (platform releases, videos, webinars, developments around critical issues of the project etc.). After the summer of 2022, when the various COVID-19 restrictions were gradually easing, new updated promo material was created and used (2nd flyer, 2nd brochure, banner, poster) by the project partners in physical events that took place during fall of 2022. A series of 3 videos were released in order to introduce and explain all of the project's aspects to the audience.

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.