



Horizon 2020 Program

Dynamic countering of cyber-attacks

SU-ICT-2018



Cyber security 4.0: Protecting the Industrial Internet of Things

### **D6.6: Dissemination strategy and activities**

**Abstract:** This deliverable presents the work performed in WP6 – Task 6.2 “Communication strategy triggering awareness and new business opportunities” with respect to the framework of the dissemination strategy and activities of C4IIoT project. The report consists of the reporting/monitoring of the respective dissemination and communication activities during the 2nd year of the project (M12-M24) and planning for the following period.

Contractual Date of Delivery	31/05/2021
Actual Date of Delivery	31/05/2021
Deliverable Security Class	Public
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### Revisions

<b>Version</b>	<b>Date</b>	<b>By</b>	<b>Overview</b>
6.6.6	28/05/2021	Spiros Fotis Jr.	Final Version
6.6.5	26/05/2021	Spiros Fotis Jr.	2 <sup>nd</sup> version (Revised by UP1PS)
6.6.4	26/05/2021	Spiros Fotis Jr.	2 <sup>nd</sup> Version (Revised by STS)
6.6.3	21/05/2021	Spiros Fotis Jr.	First draft updated
6.6.2	17/05/2021	Spiros Fotis Jr.	First draft
6.6.1	06/05/2021	Spiros Fotis Jr.	Comments on the ToC
6.6.0	26/04/2021	Spiros Fotis Jr.	ToC

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## List of Abbreviations

<b>D</b>	Deliverable
<b>EAB</b>	External Advisory Board
<b>EC</b>	European Commission
<b>EU</b>	European Union
<b>IoT</b>	Internet of Things
<b>IIoT</b>	Industrial Internet of Things
<b>KPIs</b>	Key Performance Indicators
<b>M</b>	Month
<b>SME</b>	Small-Medium Enterprise
<b>WP</b>	Work Package



## Executive Summary

This deliverable presents the work performed in WP6 – Task 6.2 “Communication strategy triggering awareness and new business opportunities” and consists mainly of the reporting and monitoring of the respective dissemination and communication activities during the second year of the project (M12-M24). As the objective of WP6 is to supervise the integrity and consistency of all dissemination efforts for creating awareness on the C4IIoT project, the main purpose of the current deliverable is to present the achievements made during the second year of the project based on the framework of the dissemination strategy presented on D6.3. All dissemination and communication activities are being continuously monitored and measured against a set of KPIs, to ensure project’s maximum awareness and at the same time its presence in relevant IIoT and IoT communities.

The second year of the project proved to be a challenge with respect to execution of dissemination and communication activities due to the COVID-19 Pandemic outbreak and the following worldwide lockdown that forced the consortium to revise the Dissemination and Communication strategy for C4IIoT project. The dissemination strategy sets out the plan to raise awareness, share knowledge, attract potential end-users and stakeholders, and explore future commercial use in the context of the C4IIoT project through various means. Considering the above, guided by the new conditions brought about by the coronavirus pandemic, the C4IIoT Consortium focused on using online means to achieve the goals set during the planning of the strategy. These means were called to fill the gap in the conduction of events of physical attendance.

Apart from revisions due to COVID-19 pandemic, the C4IIoT Consortium considered all the recommendations made by the reviewers during the M18 review meeting. Approach regarding collaborations with other RIAs has been redefined and efforts towards this end have been intensified. As suggested by the reviewers, focus has been given to dissemination and communication activities with respect to the Scientific and Academic community. Additionally, social media activity has been increased and different methods to evaluate impact with reference to dissemination and communication efforts were investigated.

Finally, future planning is being unfolded with respect to dissemination and communication efforts for the final year of the project. Moreover, it becomes clear that Dissemination is a “living” task and this deliverable provides an overview of what is known and planned at the time of the document preparation.

# 1 Introduction

## 1.1 About this deliverable

This deliverable serves as a report for the dissemination, collaboration, and communication activities for C4IIoT under WP6 carried out during the second year of the project. In addition, it provides an update on the project dissemination strategy presented at M12 (D6.3, May 2020).

In addition, this deliverable aims to evaluate the outcome of the planned dissemination and communication strategy, based on the measured KPIs. Conclusions are drawn from the overall dissemination and communication activities during the 2<sup>nd</sup> year of the development of the project.

Finally, M18 review comments and recommendations are addressed alongside with an outline of the future planning for the Dissemination and Communication strategy.

## 1.2 Relationship with other deliverables

The dissemination plan is a key document which gets all partners aligned in a common framework. It also relates to all exploitation tasks as well as the implementation progress. This deliverable is closely linked to other public documents, namely:

- D6.1 Project website
- D6.2 Market analysis and preliminary business modelling
- D6.5 Exploitation and standardization activities and best practices – final version

Additionally, this document serves as a follow up for the D6.3 Interim Version of Dissemination strategy and activities.

## 1.3 Document Structure

The deliverable is organized into seven sections whose purpose is briefly described next.

Section 1 introduces the deliverable and highlights the relationship to other C4IIoT deliverables and tasks.

Section 2 outlines the dissemination and communication strategy, presents the targeted groups, and determines the role and responsibilities of partners in a specific roadmap.

Section 3 enlists the promotional material created for Dissemination and communication purposes during the 2<sup>nd</sup> year of the project.

Section 4 provides an overview of the online tools of C4IIoT used for dissemination and communication activities and tools alongside with statistics and analytics that indicate the performance for each tool.

Section 5 lists dissemination and communication activities for the 2<sup>nd</sup> year of the project with special reference to events organized by C4IIoT consortium members.

Section 6 shows the collaboration activities during M12-M24.

In Section 7, the dissemination and communication strategy is being revised via the review of KPIs set for WP6 and comments and recommendations by M18 Review are being addressed.

In Section 8 future planning, based on the current outcomes presented here, is briefly presented.

Finally, section 9 concludes the present deliverable.

## 2 Dissemination & Communication Strategy

### 2.1 Dissemination phases

C4IIoT dissemination and communication activities are based on a strategy that is being executed in four distinctive phases in dependence with the progress of C4IIoT framework implementation. This strategy is continuously monitored and revised accordingly in order to effectively raise the impact of dissemination and communication for the project.

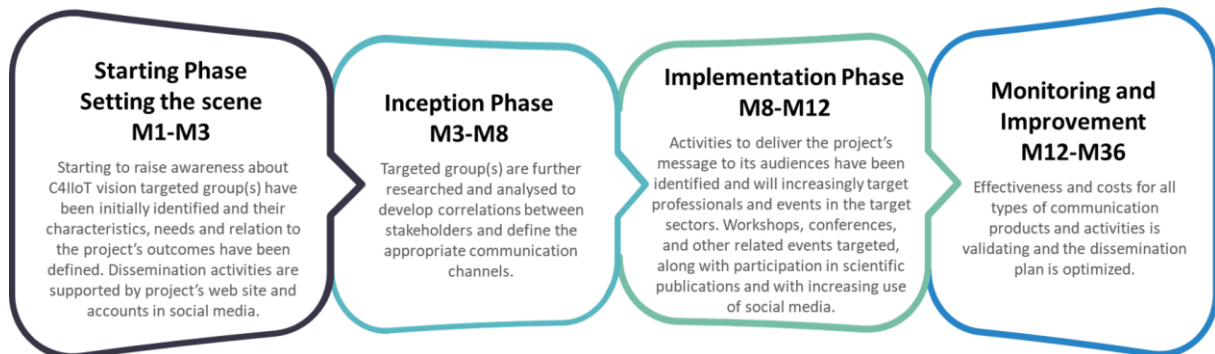


Figure 1 - Dissemination strategy phases

### 2.2 Targeted Groups

Based on the C4IIoT identity, objectives the market analysis, presented on D6.2, and the exploitation activities, outlined in D6.4, the main strategic stakeholder groupings have been identified for the dissemination and communication of the project and are listed in Table 1 below:

Table 1 - Dissemination & Communication Targeted Groups

Community	Goals – Activities	Groups
<i>Scientific</i>	<b>Goals:</b> Will be mainly interested in the research results of C4IIoT, the scientific publications generated by the project and advance beyond the state of the art. The scientific community will be able to reuse and leverage research project results in future projects.	<ul style="list-style-type: none"> <li>• <i>Research &amp; Academic organizations</i></li> <li>• <i>Research Committees and Societies</i></li> <li>• <i>Research driven hubs</i></li> <li>• <i>Research networks, platforms</i></li> <li>• <i>EU and national funded sister- projects</i></li> </ul>
	<b>Activities:</b> Scientific dissemination will include an emphasis on conferences, scientific workshops, academic papers and scientific magazines (online and print). The main messages include the approach taken, the results gained, the innovation and processes. The intention is to spread knowledge of the project and to foster feedback on complementary approaches.	
<i>Industrial</i>	<b>Goals:</b> Industrial community includes any kind of enterprise or individual that can be interested in the adoption of C4IIoT results because it brings a benefit to their business, competitiveness or return on investment.	<ul style="list-style-type: none"> <li>• <i>smart factories</i></li> <li>• <i>manufacturing, transport &amp; logistics</i></li> <li>• <i>IIoT providers</i></li> <li>• <i>research-market oriented institutions</i></li> <li>• <i>SMEs</i></li> <li>• <i>private investors</i></li> </ul>
	<b>Activities:</b> Industrial dissemination builds interest in the project to complement the exploitation plan, garner feedback from the market and identify potential partners and end-users. It will focus on typically shorter and more generic communication items (web	

	coverage, flyers, press releases, whitepaper, magazines, etc.). The key messages revolve around the C4IIoT superior capabilities, the benefits it will confer, the conditions under which it can be used and how and when users can become involved. The intention is to prepare the market, identify potential collaborators and users and to gather feedback.	
<i>Other</i>	<b>Goals:</b> It would be an omission not to mention several other groups like EU and EAB whose role is to support and guide the project. For each one of these groups the dissemination goals differ.	<ul style="list-style-type: none"> <li>• <i>EAB members</i></li> <li>• <i>EC, policy makers</i></li> <li>• <i>individuals</i></li> <li>• <i>experts</i></li> </ul>
	<b>Activities:</b> Already mentioned in the previous communities	

Bringing the project results to the attention of non-scientific audiences, scientific peers, potential business partners, and policymakers is a continuous activity which aims to foster collaboration and innovation since the 1<sup>st</sup> year of the project. Thus, dissemination activities have been targeting technology experts and stakeholders from public, private, and academic sectors familiar with technical issues. In contrast, communication activities addressed wider groups, e.g., manufacturers, telecom providers, banks (key-stakeholders), policymakers, and investors.

After the 1<sup>st</sup> review of the project, the dissemination strategy has been revised to include more effective collaborations with other projects through online activities, workshops, hackathons, webinars etc. that will enhance dissemination activities with a more efficient engagement of all target groups. To this end, identifying target groups will be a continuous task performed in the different events in which the project participates. Thus, additional tools such as the use of questionnaires and polls during online activities will allow for effectively targeting audiences identified and receive feedback from potential early adopters of the C4IIoT framework. The activation of different industrial clusters from the partners is also part of the strategy to reach potential end-users to test the platform and collect feedback for the project's long-term sustainability.

### 2.3 Individual Dissemination Plans

Following the initial individual planning for dissemination and communication, each C4IIoT partner has reviewed their planning to meet expected results during the 2<sup>nd</sup> year of the project. Revised individual Dissemination Plans are enlisted in table 2 below:

**Table 2 - Revised Individual Dissemination Plans**

Business Partner	Dissemination & communication plan
FORTH	FORTH as project coordinator joined the Observer Stakeholder Group (OSG) of Concordia open door 2020 where the C4IIoT project exhibited a virtual booth. In addition, it reached out to other European projects for joint organization of events, such as the C4IIoT winter school which occurred in December 2020 and the International Workshop on Secure and resilient smart manufacturing environments (SecRS) which is set to happen alongside the ARIS conference on year 3 of the project. In the Joint Standardisation Workshop Dynamic Counter of Cyber-Attacks projects (held online on January 22) FORTH presented an overview of the project. FORTH published various journals and papers in conferences such as the IEEE Cloud 2020 where part of the work deployed in C4IIoT was presented.
CRF	Dissemination activities in CRF have been related mainly to the participation to events, i.e., the Info Day organized last year, and to the contribution to project's social

	<p>channels. CRF will disseminate the project also participating to other future events or workshops that will be organized in the last year of the project and by means of promotion in other projects CRF is involved in.</p> <p>C4IIoT implementation in Campus Melfi has been delayed because of the pandemic, so the dissemination activities planned there have been postponed for the moment.</p>
IFAG	<p>IFAG is raising the awareness about the results of the C4IIoT project, e.g., the Hyperledger Fabric Hardware wallet, through its periodical participation in several tradeshows, conferences, and standardization bodies, such as a webinar with Coindesk or participating in the standardization workgroup of ITSA. Furthermore, synergies with concurrent EU funding projects, e.g., COLLABS, are exploited, by promoting the work among the different consortia. First prototype of Blockchain-enabled secure edge nodes has already been showcased to customers, obtaining favorable early impressions. IFAG is exploring new exploitation activities using the first prototype as a base of the work. Furthermore, high-impact journal publications to further disseminate the results are expected during the second half of the project. In addition, dissemination efforts include sharing content regarding its technology in the social media accounts of the C4IIoT project.</p>
TSG	<p>Thales is promoting C4IIoT in the other collaborative projects related to the cybersecurity of industrial domains such as COLLABS and in the community of projects from the same call. Thales will promote C4IIoT during the last year in the cybersecurity events once the framework will be more completed and adapted to the use-case.</p> <p>Concerning the standardisation organisations, Thales will disseminate on C4IIoT in the Trusted Computing Group (TCG) as an active member, in particular the entire C4IIoT project with the focus on the TPM usage will be presented on June 18 to all TCG members.</p> <p>Closer to its specific activity in the project and in the scope of enhancing the 5G security, Thales will disseminate on the usage of Software Defined Networking to limit attack surfaces by taking advantage of having the lead of the WG Security in the 5G PPP.</p> <p>Thales has organised the first INFODAY on C4IIoT, which is unfortunately postponed due to COVID-19 issues, focusing on the architecture and use-cases, the first MVP, and certain innovations in anomaly detection and the security at the edge.</p>
HPE	<p>As a leading industrial organization in IT relevant domains, HPE will utilize its large network of contacts and customers to raise awareness of the project. Examples of such activities is internal conferences like Network Security bootcamp, Bi-Weekly WW Security COE, NWI Workplace &amp; IOT Sec. Furthermore, HPE discussing on how to disseminate C4IIoT in a public event according to company's policy.</p>
CEA	<p>CEA is promoting C4IIoT among its partners in other (EU-, national, or industrially) funded projects, raises awareness through its participation in events such as A/A* cybersecurity conference, invitation to seminars, or workshops. Finally, some of the results of C4IIoT will be integrated in the open-source BINSEC platform, ensuring a wide distribution among users of the platform. In particular, CEA published a paper in the A-ranked cybersecurity conference RAID (Research in Attacks, Intrusions and Defenses) and in the top-tier cybersecurity conference Black Hat USA.</p>
IBM	<p>IBM plans to contribute to C4IIoT dissemination efforts by sharing content regarding its technology in the social media accounts of the C4IIoT project. The content will include information of IBM's decentralized access control solution in C4IIoT, the core technologies it relies on, its integration and usage within the project, and a video with demonstration of the technology.</p>
AEGIS	<p>AEGIS guides all dissemination activities and fosters dissemination while being responsible of coordinating and monitoring all C4IIoT dissemination activities. AEGIS constantly raises awareness for C4IIoT among its customers and partners in other EU-funded projects that is engaged to. Finally, AEGIS is promoting C4IIoT achievements</p>

	through its website and social networks and by participating in events and workshops.
UP1PS	<p>UP1PS will organize a summer school in Paris in the spring of 2022 on the topic of Cybersecurity for the Industrial Internet-of-Things where it will invite several C4IIoT partners to present the cutting-edge technologies that they are developing and integrating in an industrial setting for the project.</p> <p>As the CARMAS tool that UP1PS contributes to C4IIoT is based on Artificial Intelligence (AI) technologies, in particular the integration of ontologies with constraint optimization, UP1PS will also demonstrate the tool as an industrial innovative application example of these AI technologies to the vast ecosystem of the 80 partner strong H2020 AI4EU Project <a href="https://www.ai4eu.eu/">https://www.ai4eu.eu/</a> A European On-Demand Artificial Intelligence Platform and Ecosystem sole laureate of the ICT-26-2018 call and in which UP1PS leads the Verifiable AI task of the Filling AI Technology Gaps work package.</p> <p>The AI4EU ecosystem is integrated with those of the laureates of the H2020 ICT-48-2020 and H2020 ICT-49-2020 calls . These integrations bring together an exceptionally large and diverse set of industrial, societal and academic partners making the integrated ecosystem a high-impact dissemination medium</p> <p>UP1PS presented CARMAS and its integration with TSG Software Defined Network (SDN) controller at a meeting where over a dozen TSG researchers and managers were present to discuss the potential of this integration for the TSG product lines in both SDN and 5G.</p> <p>UP1PS also regularly contributes to C4IIoT dissemination efforts by sharing content regarding CARMAS, its integration with other C4IIoT technologies it interacts with and their unique benefits in the social media accounts of the C4IIoT project</p>
ITML	<p>ITML has a global business division whose mission is to seize the opportunities within the digital world and deliver new growth through venture capital, global partnerships and digital services. The dissemination strategy is based on the use of the know-how generated in this project to maintain and expand the visibility of ITML in machine learning and anomaly detection. Additionally, ITML is connecting with local and EU big solution providers and potential stakeholders in order to disseminate C4IIoT assets and services (big data management tools, integration methodology, services and processes). Furthermore, ITML is establishing dissemination activities particularly with regard to social media, existing collaborations and partnerships while also aims to deliver and transfer knowledge regarding technological advancements to the academic partners enhancing and strengthening its positioning within the EU market and research domain and built new collaborations and partnerships in the research domain of Europe. In particular, we are using our LinkedIn, Twitter and Facebook channels to post and share any project-related information, including the sharing of regular posts from C4IIoT LinkedIn &amp; Twitter accounts, as well as content related to ITML's Data Fusion Bus technology and privacy awareness and data &amp; analytics modules. We have already circulated C4IIoT's LinkedIn account among ITML's staff, especially those who are members of the project, to increase its visibility. In addition, ITML actively participated in the C4IIoT winter school held in December 2020 and its members involved in C4IIoT shall attend and/or participate in events such as workshops and conferences to further publicize the project among stakeholders and entities concerned.</p>
STS	<p>STS is responsible for the long-term sustainability and commercialisation of the C4IIoT framework, and its dissemination and communication efforts focus on promoting C4IIoT-related updates and events through the company's communication and social media channels. A number of industrial and academic events are planned where C4IIoT will be promoted, while the project is also indirectly disseminated in the context of promoting STS' activities and expertise to customers and partners.</p> <p>More specifically, STS uses its Tweeter, LinkedIn, and Facebook accounts to share information related to C4IIoT, progress updates related to the development of STS's components found in the C4IIoT platform as well as resharing content from the project's social media. Also, all STS members have been requested to join C4IIoT's social media accounts and reshare their contents to increase the project's visibility.</p>

	Furthermore, STS participates to industrial and academic events, such as the 3rd International Conference on CyberSecurity 4 Maritime - Oil & Gas - Energy CypBER 2020 and the C4IIoT Virtual International Winter School on Cybersecurity, where C4IIoT's visions and development are being communicated. In the future, STS will continue to utilize its social media accounts to publicize the project and participate in related events, aiming to publicize C4IIoT. Finally, STS aims to offer contributions and recommendations to a number of planned publications.
UNSPMF	UNSPMF constantly disseminates information about the C4IIoT project through seminars and workshops (for instance: "NB-IoT Testbed and Use Cases: Device Design and Experience with Real-World Operator Network" workshop held in Barcelona in 2020) and similar activities. Publications related to the project outcomes and results in scientific journals and conferences have been planned for the 2020-2022 period. One paper has been recently published in a top journal in the field, with at least one more in plan. Moreover, we organized the C4IIoT Winter School on Cyber Security for IIoT in December 2020.
UOG	UOG plans to publish its results through journal and conference publications. For example, we are currently preparing a journal paper, to be submitted in IEEE Internet of Things, showcasing the use of its offloading tool not only for security tasks but also for computationally intensive IoT tasks. We also plan to submit a conference paper on security-aware offloading for cross-layer anomaly detection, showcasing the benefits that dynamic offloading has for cross-layer based anomaly detection in IIoT environments. We also plan to disseminate our results through the university's website and twitter account and the C4IIoT YouTube channel.
A1 (Former VIP)	A1 contributes to dissemination activities through internal activities, within company and group of companies (A1 Srbija is part of Telekom Austria Group) – workshops and Hackathons. Contribution through external activities is done through workshops with IoT Partners and ICT/IoT conferences. A1 held a big online conference related to ICT/IoT solutions, where enterprises from government and non-government sector were invited. C4IIoT project is presented to enterprises with PDF material and through online and live meetings with enterprises.



### 3 Creation, elaboration, and provision of dissemination & communication material

#### 3.1 Design of project's promotional material

Dissemination of project's progress and outcomes during the 2<sup>nd</sup> year through different channels included the design and use of promotional material that, based on the project's visual identity, would enhance C4IIoT recognizability in target areas of interest and increase project outreach. To this end, much effort was spent on creating banners to promote events where consortium partners presented the project results (Figure 2) and also on creating a series of videos from online sessions and demonstrations of tools and technologies used in the C4IIoT solution. The following table enlists all the promotional material created during the 2<sup>nd</sup> year of the project.

Table 3 - C4IIoT List of Dissemination Material 2<sup>nd</sup> year

Dissemination & Communication Material	Description	Link
C4IIoT Overview Prezi presentation	A Prezi presentation publicly available online that outlines the project statement, main objectives and use cases.	<a href="#">Prezi Presentation</a>
C4IIoT Overview video presentation	A high quality, HD video presentation of the project and its main aspects.	<a href="#">C4IIoT Overview</a>
C4IIoT Tools Demo videos	A series of videos demonstrating tools and technologies used in the C4IIoT solution	<a href="#">Video playlist</a>
C4IIoT 1 <sup>st</sup> INFO DAY video	The recorded session of the 1 <sup>st</sup> C4IIoT INFO DAY	<a href="#">1<sup>st</sup> INFO DAY</a>



Figure 2 - C4IIoT Promotional Banners for Events

## 4 Online Dissemination & Communication of C4IIoT

### 4.1 Project website

The C4IIoT website has been designed and developed by AEGIS. The developing activities started in M1 (June 2019) and by the beginning of M2 (July 2019) it was fully operational. After a year of operation, the website was renewed with the addition of a blog page and the ability to register visitors in a newsletter service.

Table 4 - C4IIoT Website Analytics

Website Analytics			
Metric	M12	M24	% Change
Unique Users	588	2600	77%
Downloads	32	442	93%
Page Views	2089	6201	66%

#### 4.1.1 Newsletter

Email newsletters are an excellent way for an organization to share useful knowledge and demonstrate its expertise. Therefore, email newsletters will assist the C4IIoT consortium in disseminating information of project's progress, new outcomes and activities. During the 2<sup>nd</sup> year of C4IIoT's lifespan, 6 e-mail newsletters have been released with more to follow.

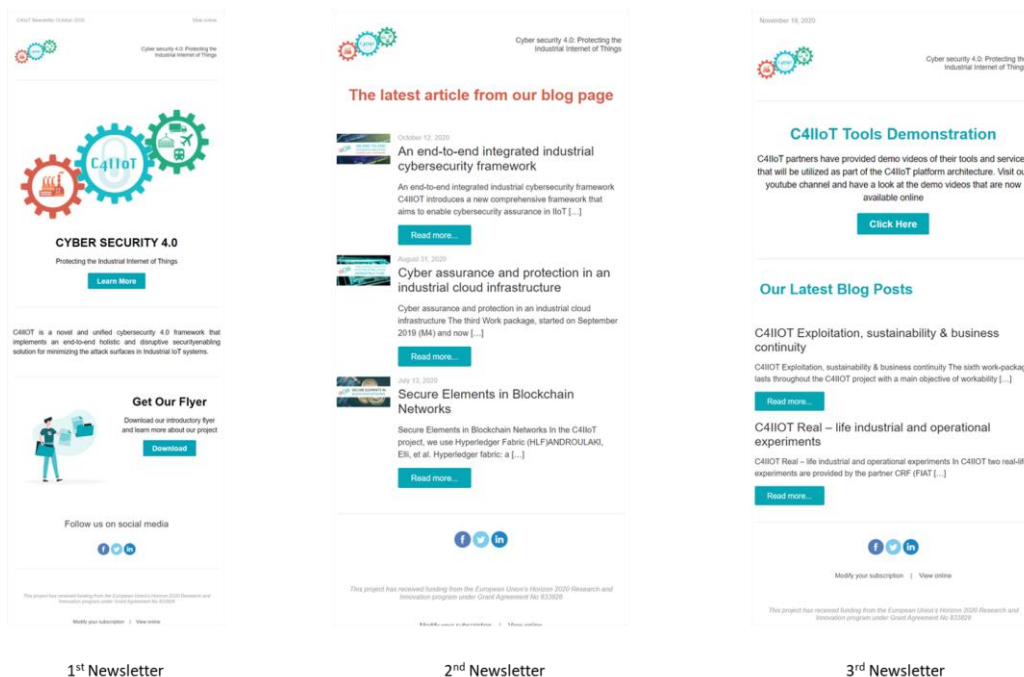


Figure 3 - C4IIoT Published Newsletters

## 4.2 Social media accounts

During the last year of the project, social media channels were heavily used to share information on project results and organization/participation in relevant events. Twitter has remained the leading channel in terms of reach, followed by the project's LinkedIn profile and the introduced (in the 2nd year) YouTube channel, which accommodates all the videos created by the consortium.

### 4.2.1 Twitter

Along with the website, a Twitter account for the C4IIoT project was launched in June 2019. During the 1<sup>st</sup> year of the project more than 17000 people we reached. On the 2<sup>nd</sup> year dissemination efforts via Twitter were intensified and that resulted to an impressive increase of 223% in audience reach.

**Table 5 - C4IIoT Twitter Analytics**

Twitter Analytics			
Metric	M12	M24	% Change
<b>Tweets</b>	13	70	<b>438%</b>
<b>Followers</b>	108	223	<b>106%</b>
<b>Audience Reached</b>	17100	65384	<b>282%</b>

### 4.2.2 Facebook

Since the start of the project, a Facebook page dedicated to C4IIoT's dissemination has been created. However, in contrast to the majority of C4IIoT's social media profiles, the page struggled in reaching a broad attention. However, Intensified activity during the 2<sup>nd</sup> year of the project resulted in extensively increasing the attention on Facebook.

**Table 6 - C4IIoT Facebook Analytics**

Facebook Analytics			
Metric	M12	M24	% Change
<b>Posts</b>	8	62	<b>87%</b>
<b>Followers</b>	29	46	<b>37%</b>
<b>Audience Reached</b>	189	2893	<b>93%</b>

### 4.2.3 LinkedIn

Following the launch of the website and Twitter account, the C4IIoT LinkedIn page was launched in June 2019. The statistics for the C4IIoT LinkedIn Page are shown in the table below.

**Table 7 - C4IIoT LinkedIn Analytics**

LinkedIn Analytics			
Metric	M12	M24	% Change
Posts	3	50	94%
Followers	45	69	35%
Audience Reached	1041	4353	76%

#### 4.2.4 YouTube

In the second year of the project, a YouTube channel was created to host demonstration videos for the C4IIoT tools. The table below shows the results of the YouTube account's analytics.

**Table 8 - C4IIoT YouTube Channel Analytics**

YouTube Analytics			
Metric	M12	M24	Change
Videos	-	13	n/a
Subscribers	-	33	n/a
Views	-	291	n/a

### 4.3 Other Web platforms

Following the project partners' commitment to promote Open Access to scientific publications and research data, C4IIoT's research outcomes have also been published in the open-access repository Zenodo:

**Table 9 - Other Web Platforms & Repositories**

Other Web Platforms	
Zenodo	<a href="https://zenodo.org/communities/c4iiot/?page=1&amp;size=20">https://zenodo.org/communities/c4iiot/?page=1&amp;size=20</a>

## 5 Dissemination & Communication activities during the 2<sup>nd</sup> year of the project

### 5.1 Publications

#### 5.1.1 Scientific Publications

##### 5.1.1.1. Journals

**Table 10 - C4IIoT Journal Publications**

Title	Authors	Link
Dynamic decision support for resource offloading in heterogeneous internet of things environments	Jaddoa, A., Sakellari, G., Panaousis, E., Loukas, G., & Sarigiannidis, P. G.	<a href="https://doi.org/10.1016/j.simpat.2019.102019">https://doi.org/10.1016/j.simpat.2019.102019</a>
Primal–Dual Methods for Large-Scale and Distributed Convex Optimization and Data Analytics	D. Jakovetic, D. Bajovic, J. Xavier, J. M. F. Moura	<a href="https://ieeexplore.ieee.org/abstract/document/9151295">https://ieeexplore.ieee.org/abstract/document/9151295</a>
On Architectural Support for Instruction Set Randomization	Christou, G, Vasiliadis, G, Papaefsthathiou, V., Papadogiannakis, A., Ioannidis, S.	<a href="https://dl.acm.org/doi/10.1145/3419841">https://dl.acm.org/doi/10.1145/3419841</a>
Primal-dual methods for large-scale and distributed convex optimization and data analytics	Dusan Jakovetic; Dragana Bajovic; Joao Xavier; Jose M. F. Moura	<a href="https://doi.org/10.5281/zenodo.4427251">https://doi.org/10.5281/zenodo.4427251</a>
Towards a Collection of Security and Privacy Patterns	M. Papoutsakis, K. Fysarakis, G. Spanoudakis, S. Ioannidis, and K. Koloutsou	<a href="https://www.mdpi.com/985826">https://www.mdpi.com/985826</a>
Deep Learning Anomaly Detection for Cellular IoT With Applications in Smart Logistics	M. Savic, M. Lukic, D. Danilovic, Z. Bodroski, D. Bajović, I. Mezei, D. Vukobratovic, S. Skrbic, D. Jakovetić	<a href="https://ieeexplore.ieee.org/document/9402912">https://ieeexplore.ieee.org/document/9402912</a>

##### 5.1.1.2. Conferences

**Table 11 - C4IIoT Conferences Publications**

Conference/ Workshop	Title	Authors	Link
Research in Attacks, Intrusions and Defenses, RAID 2020	Binary-level Directed Fuzzing for Use-After-Free Vulnerabilities	M-D. Nguyen, S. Bardin, R. Bonichon, R.Groz, M. Lemerre	<a href="https://www.usenix.org/conference/raid2020/presentation/nguyen">https://www.usenix.org/conference/raid2020/presentation/nguyen</a>
Proceedings of the 2020 IEEE CLOUD 2020	The Million Dollar Handshake: Secure and Attested Communications in the Cloud	Nikolaos Chalkiadakis, Dimitris Deyannis, Dimitris Karnikis, Giorgos Vasiliadis, Sotiris Ioannidis	<a href="https://ieeexplore.ieee.org/document/9284285">https://ieeexplore.ieee.org/document/9284285</a>
2020 6th IEEE Conference on Network Softwarization (NetSoft)	Pythia: Scheduling of Concurrent Network Packet Processing Applications on	Giannis Giakoumakis, Eva Papadogiannaki, Giorgos Vasiliadis, Sotiris Ioannidis.	<a href="https://ieeexplore.ieee.org/document/9165447/">https://ieeexplore.ieee.org/document/9165447/</a>

	Heterogeneous Devices		
3rd ACM International Workshop on Edge Systems, Analytics and Networking (EdgeSys '20)	An Enclave Assisted Snapshot-based Kernel Integrity Monitor	Dimitris Deyannis, Dimitris Karnikis, Giorgos Vasiliadis, Sotiris Ioannidis	<a href="https://dl.acm.org/doi/abs/10.1145/3378679.3394539">https://dl.acm.org/doi/abs/10.1145/3378679.3394539</a>
10th ACM Conference on Data and Application Security and Privacy (CODASPY '20)	TrustAV: Practical and Privacy Preserving Malware Analysis in the Cloud.	Dimitris Deyannis, Eva Papadogiannaki, George Kalivianakis, Giorgos Vasiliadis, and Sotiris Ioannidis	<a href="https://dl.acm.org/doi/abs/10.1145/3374664.3375748">https://dl.acm.org/doi/abs/10.1145/3374664.3375748</a>
27th Telecommunications Forum (TELFOR), Belgrade, Serbia, 2019	Robot Task Allocation based on Greedy-Face-Greedy Algorithm	J. Stanulovic, N. Mitton and I. Mezei	<a href="https://ieeexplore.ieee.org/document/8971163">https://ieeexplore.ieee.org/document/8971163</a>
2020 IEEE International Conference on Smart Internet of Things (SmartIoT), Beijing, China	In-depth Real-World Evaluation of NB-IoT Module Energy Consumption	M. Lukic, S. Sobot, I. Mezei, D. Vukobratovic and D. Danilovic	<a href="https://ieeexplore.ieee.org/document/9192393">https://ieeexplore.ieee.org/document/9192393</a>

### 5.1.2 Other Publications

Table 12 - Other Publications

Mean of publication	Title	Link
<a href="#">Black Hat USA 2020</a>	About Directed Fuzzing and Use-After-Free: How to Find Complex & Silent Bugs?	<a href="https://i.blackhat.com/USA-20/Thursday/us-20-Bardin-About-Directed-Fuzzing-And-Use-After-Free-How-To-Find-Complex-And-Silent-Bugs.pdf">https://i.blackhat.com/USA-20/Thursday/us-20-Bardin-About-Directed-Fuzzing-And-Use-After-Free-How-To-Find-Complex-And-Silent-Bugs.pdf</a>

## 5.2 Events

Table 13 - C4IIoT Events attended and/or organized

Event Title	Place	Date
Seminar at Telecommunications Technology Center of Catalonia	Barcelona, Spain	01/02/2020
3rd International Workshop on Edge Systems, Analytics and Networking (EdgeSys)	Virtual Conference	27/04/2020
6th IEEE International Conference on Network Softwarization (NetSoft)	Virtual Conference	29/06 – 03/07, 2020
Train the Trainer Program - HLRS Parallel Programming Workshop – MPI and OpenMP for beginners and advanced topics in parallel programming	Online Event	10/10/2020
IEEE CLOUD 2020	Virtual Conference	18-24/10/2020
CONCORDIA OPEN DOOR 2020	Virtual Event	28-29/10/2020

Crypto Assets Conference	Frankfurt/Germany	29-31/10/2020
Infineon's virtual show 2020	Virtual Event	10-13/11/2020
Math for Industry 4.0 - Models, Methods and Big Data, European Consortium for Mathematics in Industry (ECMI)	Online Event	2-3/12/2020
21st ECMI Conference on Industrial and Applied Mathematics (ECMI 2021)	Online Conference	13-15/04/2021
A1 Talk	Online Conference	15/04/2021
C4IIoT related talk in Robust, federated and distributed learning session on the 31st European Conference on Operations Research, <a href="https://euro2021athens.com/">https://euro2021athens.com/</a>	Hybrid event	Scheduled for 11-14/07/2021

### 5.2.1 C4IIoT 1<sup>st</sup> INFO DAY (TSG)

Due to the sanitary situation, the first INFODAY has been organized by TSG in September 2020 on the form of a Webinar. FORTH as coordinator has presented the project and its interest in the future industrial world while UNSPMF as technical leader and CRF as main end-user have presented the architecture and its applications in the automotive industry. The MVP version of C4IIoT, after 15 months, has been shown and certain specific innovations too. These innovations were first the way to adapt the anomaly detection algorithms to the calculus resources and the security at the edge. The INFODAY has been a success with more than 75 attendees.

### 5.2.2 C4IIoT at the CONCORDIA OPEN DOOR 2020

On the 28th and 29th of October 2020, C4IIoT participated in CONCORDIA's Open Door 2020 virtual event.

CONCORDIA is operating a pilot for a Cybersecurity Competence Network to develop and implement a European Cybersecurity Research and Innovation Roadmap. Consisting of 50+ partners (universities, industries, and public bodies) and funded by the European Commission, CONCORDIA is part of a significant European-wide effort to accelerate cybersecurity sovereignty. It aims to bring together experts across domains and borders.

CONCORDIA Open Door (COD) is a chance for stakeholders of all backgrounds (such as IT, entrepreneurship, education, economy, and policy) to discuss societal and technological needs in the cybersecurity field and to discover others' competences for potential collaborations.

C4IIoT held a virtual exhibitor stand to present the project to industry specialists and other event participants. Our booth can be seen below:

**Exhibitors > C4IIoT**

**Industry 4.0**  
**Automotive**  
**Logistics 4.0**

**Trustworthiness**  
**Accountability**  
**Industrial IoT**  
**Blockchain**  
**Security Assurance**  
**Machine Learning**  
**Behavioural Analysis**  
**Privacy**  
**Hardware Security**  
**Cyber attacks**  
**Secure Execution**  
**Risk Management**  
**Secure Execution**

**big idea.**

**A novel and unified cybersecurity 4.0 framework that implements an end-to-end holistic and disruptive security solution for...**

**C4IIoT**  
Visit booth  
Go to website

**Contact people**

- Georgos Tsirantonakis - FORTH
- Spiros Fotis Jr.
- Spyros Vantolas

**About**

C4IIoT is an EU funded project that aims to design, build and demonstrate a novel and unified Cybersecurity 4.0 framework that implements an innovative IoT architecture paradigm to provide an end-to-end holistic and disruptive security-enabling solution for minimizing the attack surfaces in Industrial IoT systems. C4IIoT bridges cyber assurance and protection, machine (deep) learning (ML/DL), edge/cloud computing, blockchain and Big Data technologies to provide a viable scheme for enabling security and accountability, preserving privacy, enabling reliability and assuring trustworthiness within evolving IIoT applications and processes (e.g. automotive). C4IIoT novel cybersecurity mechanisms are carefully orchestrated across all infrastructure elements involved within an IIoT system (e.g., IIoT devices, field gateways, cloud resources) and is based upon analysis of various data flows (e.g., IIoT device data, encrypted network flows).

**C4IIoT Consortium**

**C4IIoT Introductory Flyer**

[[insert: Feel free to download our introductory flyer and learn more about the C4IIoT Project v1]]

C4IIoT Introductory Flyer.pdf [Download](#)

**Media**

**C4IIoT-Media**

**Figure 4 - C4IIoT Virtual Booth on CONCORDIA OPEN DOOR 2020**

### 5.2.3 C4IIoT International Winter School on Cybersecurity (UNSPMF)

Virtual International Winter School on Cybersecurity, coordinated by the University of Novi Sad and C4IIoT consortium, has been held at 2-4 December 2020. During the three days of the school, several presentations from cybersecurity experts, entrepreneurs and researchers attracted the attention of the audience. Beside the detailed presentation of C4IIoT that included demonstration of the C4IIoT framework, during day 2, the projects CYBERSANE and COLLABS have also been presented. More than 60 people attended the sessions while 36 were registered.



## 6 Collaboration Activities

### 6.1 Overview

When it comes to addressing and driving innovation, collaboration is a central principle. C4IIoT focuses on collaborating with and contributing to other relevant European initiatives in this context. As a result, proposals and project results will be widely disseminated and actively promoted to the target audience. The basic concept behind collaboration is that projects operating in similar fields will benefit from synergies, complement each other in research and industry, join forces to meet their target audiences, and achieve the critical mass needed to make a real difference, and so on.

To that end, C4IIoT consortium participants connected with related initiatives and participated in a variety of concrete partnership activities, such as collaborative events, information exchange, sharing outcomes, and integrating findings in cybersecurity-driven innovation.

### 6.2 Collaborations with other projects

#### 6.2.1 C4IIoT & Collabs

Table 14 - C4IIoT & COLLABS

Characteristic	Description
<b>COLLABS</b>	<p>COLLABS will develop, validate, demonstrate, and support a comprehensive cyberintelligence framework for collaborative manufacturing, which enables the secure data exchange across the digital supply chain while providing high degree of resilience, reliability, accountability and trustworthiness, and addresses threat prevention, detection, mitigation, and real-time response.</p> <p>COLLABS will achieve these goals by utilising state-of-the-art technologies and making significant scientific and technological advances in several key relevant domains, including secure multi-party computations and homomorphic encryption, distributed deep learning and anomaly detection, distributed ledger technologies (blockchain) and smart contracts, and distributed remote software attestation.</p>
<b>C4IIoT in comparison to COLLABS</b>	Both projects aim to improve Industry 4.0. C4IIoT focuses on providing unified Cybersecurity 4.0 framework to industries while COLLABS focuses on providing a framework for enhanced data exchange in the industry 4.0 environment.
<b>Concrete collaboration activities</b>	Both projects will collaborate by co-organizing the 1 <sup>st</sup> International Workshop on Secure and resilient smart manufacturing environments (SecRS).

#### 6.2.2 C4IIoT & CyberSane

Table 15 C4IIoT & CyberSane

Characteristic	Description
<b>CyberSane</b>	CyberSANE enhances the security and resilience of Critical Information Infrastructures (CIIs) by providing a dynamic collaborative, warning and response system supporting and guiding security officers and operators to recognise, identify, dynamically analyse, forecast, treat and respond to advanced persistent threats (APTs)

	and handle their daily cyber incidents using structured and unstructured data such as logs, network traffic, or data coming from social networks.
<b>C4IIoT in comparison to CyberSane</b>	Both CyberSane and C4IIoT aim to enhance security by developing frameworks that will provide end users with unified solutions towards cyber-attacks.
<b>Concrete collaboration activities</b>	Both projects will collaborate by co-organizing the 1st International Workshop on Secure and resilient smart manufacturing environments (SecRS).

### 6.2.3 C4IIoT & FISHY

**Table 16 - C4IIoT & FISHY**

<b>Characteristic</b>	<b>Description</b>
<b>FISHY</b>	FISHY aims to deliver a coordinated cyber resilient platform towards establishing trusted supply chains of ICT systems through novel evidence-based security assurance methodologies and metrics as well as innovative strategies for risk estimation and vulnerabilities forecasting leveraging state-of-the-art solutions, leading to resilient complex ICT systems.
<b>C4IIoT in comparison to FISHY</b>	Both projects aim to provide unified Cybersecurity frameworks with FISHY focusing on supply chains and C4IIoT on Industry 4.0 systems.
<b>Concrete collaboration activities</b>	Both projects will collaborate by co-organizing the 1 <sup>st</sup> International Workshop on Secure and resilient smart manufacturing environments (SecRS).

## 7 Dissemination & communications strategy revision

### 7.1 KPIs evaluation and revision.

Table 17 - C4IIoT Dissemination & Communication KPIs

	#dKPI	Description	Target	Progress	% reach of goal
Online Dissemination KPIs	dKPI#1	Web access to project related information	>1000 access annually >100 downloads	2600 accesses in 2 years 442 downloads	<b>260%</b> <b>442%</b>
	dKPI#2	Push announcements through social media	>50 push announcements	185	<b>370%</b>
	dKPI#3	Newsletter with C4IIoT technical activities	>9	6	<b>67%</b>
	dKPI#4	High-quality electronic brochure with the technical approach of C4IIoT	>2000 hard copies >2000 downloads	0 hard copies 442 downloads	<b>0%</b> <b>22%</b>
	dKPI#5	5 min high-quality video presentations	>1000 views >10 events	284 views 1 event	<b>28%</b> <b>10%</b>
Scientific Publications KPIs	dKPI#6	Publications in International referred technical journals in cybersecurity	>10	5	<b>50%</b>
	dKPI#7	Publications in International magazines in cybersecurity	>10	0	<b>0%</b>
	dKPI#8	Publications in International referred technical conferences in cybersecurity	>12	8	<b>67%</b>
	dKPI#9	Publications of special issues in International referred technical journals and magazines, with more than 10 selected papers per issue	>2	3	<b>150%</b>
Events related KPIs	dKPI#10	International conferences in cybersecurity organised	>1 with >100 attendees	TBA	<b>0</b>
	dKPI#11	Workshops organised	>2 with >30 attendees	1	<b>50%</b>
	dKPI#12	Demo presented on major fairs and exhibitions	>1	0	<b>0</b>
	dKPI#13	Demos at major EU events	>2	0	<b>0</b>
	dKPI#14	Demos at major conferences	>2	0	<b>0</b>
	dKPI#15	Education and training activities events organised	>3 with >70 attendees	1	<b>33%</b>
	dKPI#16	International summer schools in cybersecurity in the IIoT domain organised	>2	1	<b>50%</b>

**Table 18 - C4IIoT Impact KPIs**

#eKPI	Description	Success Indicator	Progress	% reach of Goal
eKPI#1	C4IIoT website	>5000 accesses annually >500 downloads	2600 accesses 442	52% 88%
eKPI#2	Press echoes in Europe	>=10	0	0%
eKPI#3	Newspapers (business and normal) in Europe	>=10	3	30%
eKPI#4	Newsletters worldwide	>9	6	67%
eKPI#5	Social Media	>500 followers	336	67%
eKPI#6	Public lectures and/or networking events for end users & general public	>=2 with >50 attendees	2	100%
eKPI#7	Public lecture and/or networking event for policy makers	>=2 with >20 attendees	2	100%
eKPI#8	Policy events targeting policy makers of EU, National, Regional and Local Authorities	>=4 with >50 attendees	4	100%

Tables Table 17 and Table 18 outline the progress made on KPIs during the 1<sup>st</sup> and 2<sup>nd</sup> year of the project. As can be seen from the above tables, the efforts so far have yielded encouraging results that in some cases manage to surpass the goals set during the planning of the strategy. During the 2<sup>nd</sup> year the efforts are intensified further with the aim of achieving all the goals. From the same tables it also becomes clear that some targets are far from the results reported so far as the coronavirus pandemic made it quite difficult to carry out actions that required physical presence. Given the gradual return to normalcy, but also the implementation of more tangible results from the project, we hope to achieve the specific goals by intensifying efforts towards this direction within the 3<sup>rd</sup> year of the project.

## 7.2 Project Monitoring Review Recommendations

During the project's mid-term official review (M18) by the EU Commission, we received from the reviewers some comments and recommendations about dissemination strategy and activities.

Table 19 summarizes the comments received and actions taken or considered to address these issues.

**Table 19 - C4IIoT M18 Review comments**

M18 Review Comments & Recommendations	Addressing Actions
Dissemination and communication results are of good quality in terms of impact. However, during the next period scientific dissemination has to be stressed.	Scientific contribution in terms of papers and publications submission for C4IIoT have been intensified during the 2 <sup>nd</sup> year.
Scientific contributions are of good quality and directly related with the activity performed within the project, however number of publications in journals have to increase in the next period.	The participation of C4IIoT on the online repository "Zenodo" aims to further promote scientific dissemination focusing on Open Access notion.
The industrial community has been addressed.	Industrial community remains a pivotal target group

<p>However, it is needed that during the second period of the project more events are planned.</p> <p>The consortium has to be involved in industrial events as much as possible during the next period, although many events are being cancelled and others are becoming virtual. It is highly recommended that the consortium re-evaluate the strategy towards these kind of events.</p>	<p>with respect to C4IIoT dissemination and communication activities.</p> <p>To this end, identifying relevant events has become a priority for C4IIoT partners in addition with efforts to attend such events either online or with physical presence when possible.</p>
<p>Actions towards SME dissemination have to be enhanced, a part of liaisons with different RIAs. It is advised to contact and disseminate project results in SME clusters and Digital Innovation Hubs related with the results of the project</p>	<p>The consortium and especially the SMEs participating in C4IIoT agreed to intensify their efforts to disseminate project results in related SME clusters.</p> <p>We are currently in discussions with Athena Research Center<sup>1</sup> and PRAXI<sup>2</sup> Digital Innovation Hub to demonstrate C4IIoT.</p>
<p>Research publications need to increase its number, it is recommended to write a publication related with the project architecture which can be a relevant contribution and may create impact associated with the project.</p>	<p>Scientific contribution in terms of papers and publications submission for C4IIoT has been intensified during the 2<sup>nd</sup> year.</p> <p>The participation of C4IIoT on the online repository “Zenodo” aims to further promote scientific dissemination focusing on Open Access notion.</p> <p>A publication related with the project’s architecture is being prepared by Consortium members.</p>
<p>The dissemination and communication strategy need to identify targets, for the next period an analysis of the potential target and the actions taken towards them associated with an evaluation of corresponding KPIs has to be included in the deliverable D6.6</p>	<p>Table 2 of section 2.2 addresses this in detail.</p> <p>Section 7 evaluates dissemination and communication KPIs.</p>
<p>For dissemination and communication actions it is recommended to use different metrics, to evaluate impact. For example, attendees to a workshop, but in parallel increase of accesses to the website or followers in a social network. This may provide help to understand if dissemination/communication actions are successful.</p>	<p>Google Analytics is being used for website metrics. This provides insight in detail and the impact of dissemination and communication activities can be identified and estimated.</p> <p>Analytics for social media accounts are being monitored in monthly basis and significant changes are easily identified, estimated and associated with dissemination activities.</p> <p>During the forthcoming events organised by C4IIoT we will monitor their impact in online dissemination channels.</p>
<p>The website is online and offers information about the project (i.e. publications, deliverables, and news). Although social network profiles have been created, activity is limited, and the number of followers is reduced. The consortium is encouraged to identify the most adequate target groups and increase the number of followers.</p>	<p>As presented in tables 3 to table 7 all social media accounts have increased in numbers and audience reach.</p>

<sup>1</sup> <https://www.athenarc.gr/en>

<sup>2</sup> <http://praxinetwork.gr/en/>

## 8 Future Planning

What is expected for the following period is to increase C4IIoT activities in expanding our audience and by engaging even more target groups. Given the fact that the prototype of C4IIoT is recently released, the consortium will utilize the dissemination toolkit at its fullest to promote the final product release that is expected by the end of M36.

Emphasis will be given to the organization of events for specific target groups and general audience. Intensifying efforts towards the further increase in numbers with respect to the C4IIoT online dissemination and communication channels remains a priority as well. Based on the allowed conditions due to COVID-19 pandemic, the C4IIoT consortium expects the organization of a big event towards the end of the project which will also mark the beginning for the further exploitation of the final solution.

## 9 Conclusions

This deliverable aims to outline the achievements with respect to the Dissemination and Communication activities planned and organized during the 2<sup>nd</sup> year of the C4IIoT project.

As it has been demonstrated throughout this document, the main goals set in the dissemination and communication plan created for the project have been achieved. This is reflected by the key achievements reported through this report and the level of completion of the KPIs outlined in Table 17 of this deliverable.

During the second year of the project, a notable presence on the web and social media has been achieved and this has been reflected on the KPIs.

The outbreak of COVID-19 led to a setback for creating more events with physical presence since physical meetings were prohibited. The C4IIoT partners investigate alternatives for the conduction of planned events that have been postponed due to the pandemic.

In addition, and in order to have a complete picture of the performance of the planned strategy, the consortium decided to create an additional final report on the dissemination and communication activities. Although this is not required by the GA, it is considered that this final report is necessary as efforts will be intensified during the last year of the project and this should be recorded in writing.