Grant Agreement N°: 101020259
Topic: SU-DS02-2020

ARCADIAN-IoT

Autonomous Trust, Security and Privacy Management Framework for IoT

D6.8: Outreach activities report M36

Revision: v.1.0

Work package	WP 6
Task	Task 6.1, 6.4
Due date	30/04/2024
Submission date	14/05/2024
Deliverable lead	Martel
Version	1.0

Abstract

This document offers an overview of the activities carried in T6.1 and T6.4 of Work Package 6 - Dissemination, Communication and Exploitation pursued for awareness creation and engagement of top-notch players. These activities are guided by the Dissemination and Communication Strategy and Plan (D6.1). The activities described in this deliverable focus on communication and dissemination activities carried out between M25 and M36 of the project, including news, content for the website, events and social media animation.

Keywords:

IoT, Dissemination, Communication, Marketing, Online Communication, Communications Task Force, Events, Content, Visual Identity, Web Portal, Social Media, Promotional Material, Newsletter, Presentations, Conferences, Workshops.

Document Revision History

Version	Date	Description of change	List of contributor(s)
V0.1	01/04/2024	ToC and first draft of the deliverable	Martel (Valentin Popescu)
V0.2	03/05/2024	Content production	Martel (Valentin Popescu)
V0.3	06/05/2024	Internal review	RGB (Ricardo Nolasco)
V0.4	08/05/2024	Revised and edited	Martel (Valentin Popescu)
V1.0	14/05/2024	Final version	Martel (Valentin Popescu), IPN (Sérgio Figueiredo)

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PU	Public, fully open, e.g. web	√
CI	Classified, information as referred to in Commission Decision 2001/844/EC	
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** R: Document, report (excluding the periodic and final reports)*
DEM: Demonstrator, pilot, prototype, plan designs
DEC: Websites, patents filing, press & media actions, videos, etc.

OTHER: Software, technical diagram, etc

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EXECUTIVE SUMMARY

This report presents the communication and dissemination activities of the ARCADIAN-IoT project during the reporting period (M25-M36). The ARCADIAN-IoT project has demonstrated significant progress in its outreach activities from M25 to M36. These efforts have been crucial in promoting the project's results within the IoT ecosystem. This report encapsulates the range of dissemination and communication strategies employed to engage a wide array of stakeholders and amplify the project's visibility and impact.

Social media communication played a vital role, with the project maintaining an active presence on Twitter and LinkedIn. This effort led to achieving over 484 followers on Twitter and 315 on LinkedIn. The project also established a YouTube channel that shared detailed insights and results from various project activities, which significantly enhanced the project's multimedia outreach and attracted substantial views.

Events and workshops served as crucial platforms for direct stakeholder engagement. The project participated in significant industry events like EBDVF 2023 and the MEDICA Trade Fair 2023 and hosted the ARCADIAN-IoT Summer School and various thematic webinars. These events were important in disseminating project results.

Publications also formed a core part of the project’s dissemination strategy. Numerous scientific articles and conference papers were published, which highlighted the project's research outcomes and technological advancements.

Promotional materials such as posters, newsletters, and brochures were produced and distributed at various events to effectively communicate the project’s objectives and achievements. This approach not only informed participants about ARCADIAN-IoT but also enhanced the visibility of the project’s contributions to IoT security.

The project’s web portal served as a central hub for information, attracting significant traffic and providing updates on the project’s progress and outputs. Key Performance Indicators (KPIs) were used to monitor and reflect the success of the outreach efforts, with notable achievements in social media growth, event participation, and viewership of online content. High engagement rates on social media platforms and substantial interactions on the project’s YouTube channel indicated that the communication strategies were effective and resonated well with the target audience.

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INTRODUCTION

During the period from M25 to M36 of the project, WP6 was dedicated to implementing an extensive range of tools and initiatives to initially disseminate information and engage with relevant stakeholders. WP6 worked in close collaboration with other WPs in the ARCADIAN-IoT project, the European Commission, and other pertinent H2020 projects. The Communication Task Force (CTF) facilitated coordination with these entities, which consisted of dissemination and communication partners from H2020 projects that were funded under the same call.

1.1 Purpose of the document

The Dissemination and Communication Report for the reporting period (May 2023 - April 2024) presents an overview of the communication and dissemination activities of the ARCADIAN-IoT project.

This deliverable expands upon the strategic framework established in Deliverable 6.1, "Dissemination and Communication Strategy and Plan" and aims to achieve the following objectives:

- Describe the implemented communication and engagement activities, as well as the monitoring and evaluation processes.
- Illustrate how the methods, tools, and promotional materials have been utilized in the project's dissemination and communication efforts.
- Provide a comprehensive summary of the communication activities. The report focuses on the key actions carried out during the **third communication phase of the project: ARCADIAN-IoT global outreach and sustainable impact**. In this phase, ARCADIAN-IoT actively engaged and supported the adoption and deployment of the concepts and tools offered by the project, through dedicated promotional activities. This included publications, development and distribution of promo materials and deliverables. ARCADIAN-IoT participated in events, organized the second series of three cybersecurity use cases' training (in collaboration with WP5), and thematic webinars to present the project’s results to, fostered liaisons with relevant initiatives. ARCADIAN-IoT also organized a Summer School to engage the research community.

1.2 Structure of the document

The sections of the deliverable at hand are organised in the following manner:

- Section 1 gives an introduction to the document
- Section 2 presents objectives of the communication and dissemination activities
- Section 3 presents the various types of communication and dissemination activities and tools used in order to support the project’s activities.
- Section 4 describes ARCADIAN-IoT’s synergies and interaction with external initiatives.
- Section 5 depicts the metrics for the evaluation of the dissemination and communication activities.
- Section 6 concludes the document.

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2 DISSEMINATION AND COMMUNICATION FOR ARCADIAN-IOT

2.1 Dissemination and communication objectives

The main aim of ARCADIAN-IoT is to foster a stronger, more innovative, and more resilient European industry by providing a reliable and advanced framework for trust, security, and privacy management in IoT systems. WP6 manages dissemination and communication activities in close collaboration with all ARCADIAN-IoT tasks and work packages as appropriate, which includes refining branding and visual identity, animation of the web portal, social media channels, promotional materials, and main communication tools.

WP6 leads a set of dedicated dissemination and communication actions with the following objectives:

- Ensure broad visibility and awareness of ARCADIAN-IoT, promoting project knowledge and establishing a recognizable identity to support promotional and marketing efforts.
- Engage and stimulate a critical mass of relevant stakeholders to effectively showcase project results, leading to validation and further adoption of the developed technologies.
- Contribute significantly to relevant scientific domains and standardization bodies as appropriate and relevant to planned exploitation plans and project outcomes.
- Establish liaisons and ensure close collaboration with relevant initiatives in the industry and R&I domains, particularly with projects being funded in SU-DS02-2020 call.

2.2 Communication phases

In the reporting period, dissemination and communication activities were carried out related to the **third phase of communication and dissemination** activities, as defined in D6.1: **ARCADIAN-IoT global outreach and sustainable impact (M25-M36),** according to Figure 1.

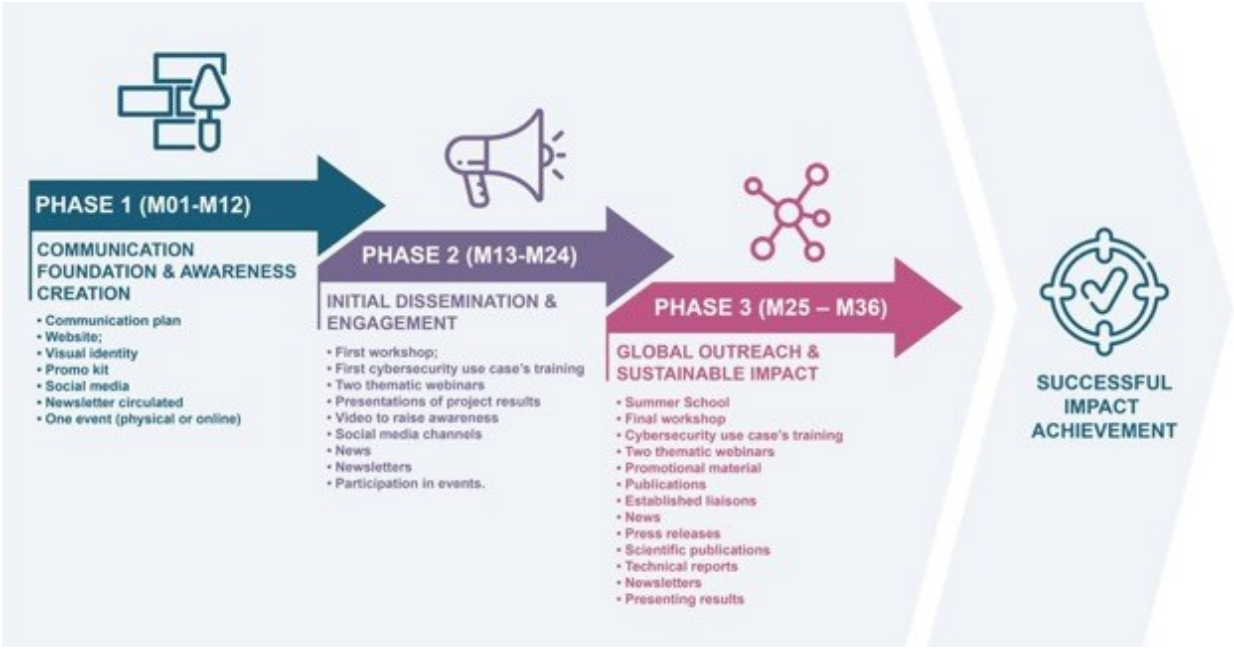

Figure 1: ARCADIAN-IoT communication phases.

In this third phase, the primary focus was to disseminate the results from the project and engaging target stakeholders The following communication strategy and activities were carried out:

- Organisation of the thematic webinars: ARCADIAN-IoT organized four thematic webinars showcasing the different components of the framework.
- Organisation of the ARCADIAN-IoT Summer School: The school aim was to provide a comprehensive understanding of the challenges and opportunities that IoT cybersecurity presents.
- Presentation of project results and demos: ARCADIAN-IoT showcased the outcomes and milestones at various events and conferences.
- Producing videos to raise awareness: These videos were created to highlight the project's objectives, achievements, and impact.
- Animating social media channels: The project team actively engaged with stakeholders and the public through various social media platforms.
- Publishing news items on the project website and media: Regular updates were posted to keep stakeholders informed about the project's progress.
- Distributing newsletters: Periodic newsletters were sent out to stakeholders to maintain interest and update them on project milestones.
- Participating in events through presentations and demos: Team members attended events to network, share knowledge, and promote the results of the project.
- ARCADIAN-IoT final event: The event, hosted by RISE Research Institutes of Sweden, together with SENTINEL project, brought together experts to demonstrate the latest innovations in IoT cybersecurity and personal data protection.

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3 DISSEMINATION AND COMMUNICATION IN ACTION

3.1 Active Communication and Dissemination of Key Content

In order to engage with its target audience and stakeholders, ARCADIAN-IoT employs a diverse range of communication and dissemination methods. The ARCADIAN-IoT website serves as the primary information hub for the community, while social media channels, newsletters, news articles, blogs, and curated stories are also utilized. Content is strategically shared through specialized channels to maximize reach.

3.2 Web Portal

The fully functional ARCADIAN-IoT website (https://www.arcadian-iot.eu) represents the entry point that enables the project to reach to all stakeholders involved. All relevant information about projects, outcomes, events, milestones, developments, etc., are exposed and accessible via the dedicated areas the portal has been structured around.

The website has a clear and clean communication interface that is easily navigable, containing all relevant project related public information. The website also offers direct access to the most relevant documents produced by the consortium.

Since its launch, the website is regularly updated and the content continuously improved to reflect the evolution of the project. In the reporting period, updates where made to the following section:

- **ARCADIAN-IoT Domains: Emergency and Vigilance** (https://www.arcadian-iot.eu/emergency-and-vigilance/), **Industrial Control Systems** (https://www.arcadian-iot.eu/industrial-control-systems/), **Medical IoT** (https://www.arcadian-iot.eu/medical-iot/). On each page, several videos were published to present the domains and how they integrate different ARCADIAN-IoT framework components.
- **Blog section**: https://www.arcadian-iot.eu/blog/
- **Videos:** this page contains all the videos related to the activity of ARCADIAN-IoT project (besides the dedicated Youtube channel): https://www.arcadian-iot.eu/videos/
- **Publications:** this page gives the opportunity to view all the scientific publications from ARCADIAN-IoT: https://www.arcadian-iot.eu/publications/
- **ARCADIAN-IoT Trainings** (https://www.arcadian-iot.eu/trainings/): This page provides access to the trainings organised in collaboration with WP5 on the several components of the framework.
- ARCADIAN-IoT Innovations (https://www.arcadian-iot.eu/arcadian-iot-innovations/): This page provides an in-depth look at the innovations brought by the ARCADIAN-IoT framework, presenting one by one each plane and each component:

During the reporting period, several news items were published on the website:

- Federated AI: the key to dependable and privacy-preserving IoT in the ARCADIAN-IoT framework: https://www.arcadian-iot.eu/ependable-privacy-preserving-federated-ai-arcadian-iot/
- ARCADIAN-IoT Webinar series addressing the IoT security challenges: https://www.arcadian-iot.eu/arcadian-iot-webinar-series-addresses-iot-security-challenges/
- ARCADIAN-IoT partner contributes to study on hospital-based proton therapy during COVID pandemic: https://www.arcadian-iot.eu/arcadian-iot-partner-contributes-to-study-on-hospital-based-proton-therapy-during-covid-pandemic/
- ENISA report: good practices for supply chain cybersecurity: https://www.arcadian-iot.eu/enisa-report-good-practices-for-supply-chain-cybersecurity/
- ARCADIAN-IoT Summer School: a successful start in Stockholm: https://www.arcadian-

iot.eu/arcadian-iot-summer-school-a-successful-start-in-stockholm/

- ARCADIAN-IoT Summer School delivers a comprehensive overview of IoT Security: https://www.arcadian-iot.eu/arcadian-iot-summer-school-delivers-a-comprehensive-overview-of-iot-security/
- ARCADIAN-IoT tales central stage at the Cybersecurity Cluster Projects meeting: https://www.arcadian-iot.eu/arcadian-iot-takes-center-stage-at-the-cybersecurity-cluster-projects-meeting/
- ARCADIAN-IoT spotlights privacy and data protection in latest webinar: https://www.arcadian-iot.eu/arcadian-iot-spotlights-privacy-and-data-protection-in-latest-webinar/
- Security of 6G IoT applications for emergency and vigilance: https://www.arcadian-iot.eu/security-of-6g-iot-applications-for-emergency-and-vigilance/
- Enabling secure and scalable identity management for IoT with SSI in 6G networks: https://www.arcadian-iot.eu/enabling-secure-and-scalable-identity-management-for-the-internet-of-things-iot-with-ssi-in-6g-networks/
- Joint efforts unveiled. SecureCyber Cluster soearheads collaborative approach in cybersecurity: https://www.arcadian-iot.eu/joint-efforts-unveiled-securecyber-cluster-enhancing-cybersecurity-spearheads-collaborative-approach-in-cybersecurity/
- Unleashing the power of connectivity: Navigating the landscape of 6G, Industrial IoT and Industry 4.0 in the cloud era: https://www.arcadian-iot.eu/unleashing-the-power-of-connectivity-navigating-the-landscape-of-6g-industrial-iot-and-industry-4-0-in-the-cloud-era/
- ARCADIAN-IoT webinar explores identity and trust in the evolving landscape if IoT: https://www.arcadian-iot.eu/arcadian-iot-webinar-explores-identity-and-trust-in-the-evolving-landscape-of-iot/
- Privacy and Security: the ARCADIAN-IoT innovative use of Biometric data: https://www.arcadian-iot.eu/privacy-and-security-the-arcadian-iots-innovative-use-of-biometric-data/
- ARCADIAN-IoT and SENTINEL Symposium highlights IoT cybersecurity and data privacy innovations: https://www.arcadian-iot.eu/arcadian-iot-and-sentinel-symposium-highlights-iot-cybersecurity-and-data-privacy-innovations/
-

ARCADIAN-IoT website analytics

In the reporting period (May 2023 - April 2024), the ARCADIAN-IoT website had 1,545 users, 5,006 views and over 13,000 events (how often users interact with specific elements on a website within a given time span). The average duration of the visit was 3m 07s.

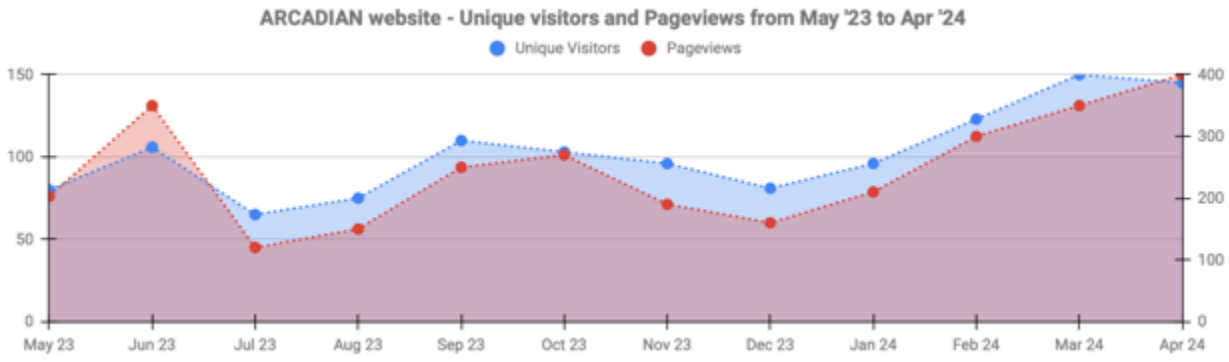

Figure 2: ARCADIAN-IoT website analytics in the reporting period.

The most visited pages of the website were:

	Page title and screen class	↓ Views	Users	Views per user	Average engagement time	Event count All events
		5,006 100% of total	1,545 100% of total	3.24 Avg 0%	3m 07s Avg 0%	13,425 100% of total
1	HOMEPAGE - ARCADIAN-IoT	2,597	979	2.65	3m 59s	7,072
2	ARCADIAN-IoT Summer School "IoT Cybersecurity: Tackling Challenges and Opportunities" - ARCADIAN-IoT	888	288	3.08	1m 17s	2,438
3	IoT Cybersecurity and Privacy Compliance Symposium and Showcase - ARCADIAN-IoT	298	149	2.00	1m 21s	819
4	THE PROJECT - ARCADIAN-IoT	202	161	1.25	23s	538
5	EVENTS - ARCADIAN-IoT	104	68	1.53	14s	226
6	CONSORTIUM - ARCADIAN-IoT	72	62	1.16	30s	183
7	VISION & STRATEGY - ARCADIAN-IoT	60	53	1.13	11s	139
8	Cyber Threat Intelligence: Empowering IoT Security Workshop - ARCADIAN-IoT	38	31	1.23	10s	122
9	PUBLIC DELIVERABLES - ARCADIAN-IoT	38	27	1.41	24s	83
10	ARCADIAN-IoT Webinar Series: Building a secure IoT ecosystem - ARCADIAN-IoT	37	15	2.47	1m 01s	109

Figure 3: Most visited pages of the ARCADIAN-IoT website.

3.3 Social Media

Twitter, LinkedIn and Youtube social media channels were established as communication tools in order to promote activities and outputs of the project on a regular basis, while also encouraging a wider discussion on the topics related to the project's activities. So far, ARCADIAN-IoT created an active presence on the most popular social media channels, such as Twitter and LinkedIn, which are linked to the project's website. In addition, the YouTube channel was opened, and it features videos from the events where ARCADIAN was presented, interviews with the consortium partners and animated video showcasing the use cases.

3.3.1 Twitter

ARCADIAN-IoT has established its Twitter account @ArcadianIoT (https://twitter.com/ArcadianIoT) in April 2021 and since then has used the social medium to inform and engage the relevant audience and create awareness about the project.

The Twitter account is used for promoting and disseminating the development of ARCADIAN-IoT, including news, events, outcomes, etc. Moreover, re-tweets are made of relevant and interesting content from disparate sources.

By the time of writing this report, ARCADIAN-IoT has 484 followers and has posted, on average, one tweet a week, beside the regular retweets from other followed accounts. The number of impressions in the reporting period exceeds 260,000.

ARCADIAN-IoT @ArcadianIoT · Oct 30, 2023
#ARCADIANIoT trainings are now ONLINE!
Dive deep into the world of #IoT #cybersecuirty from the comfort of your home. Our courses for #ICT users are just a click away.
arcadian-iot.eu/trainings/
caps lock
A
Z
X
TRAINING
fn + esc
fn

ARCADIAN-IoT @ArcadianIoT · Jun 1, 2023
The #IoT landscape is expanding rapidly and, with it, the potential for #cyberattacks.
Get insights on how to improve the #cybersecurity of IoT devices and systems at our webinar on June 9.
Register today: t.ly/4B9I
ARCADIAN-IoT
WEBINAR SERIES
Building a secure IoT ecosystem
1
SECURING IoT DEVICES: BEST PRACTICES AND EMERGING TECHNOLOGIES
9 June 2023 - 10:00 am CET - online
SPATIAL Project and 6 others

Figure 4: Examples of top tweets from the ARCADIAN-IoT account.

3.3.2 LinkedIn

LinkedIn is a business-oriented professional networking tool that is used by many as a source of information and inspiration, therefore, it serves as a solid tool to amplify the news shared on the website. It is an important platform for discussions relevant to ARCADIAN-IoT, among experts in the area and various stakeholders in general.

The ARCADIAN-IoT LinkedIn page (https://www.linkedin.com/company/arcadian-iot/) allows reaching a professional audience with more elaborated news and/or specific events highlights. The page was established in April 2021, ahead of the project's start, and has at the time of writing this report 315 followers. During the reporting period, the Linkedin page had over 17,400 impressions.

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Below, a few key figures regarding the LinkedIn account:

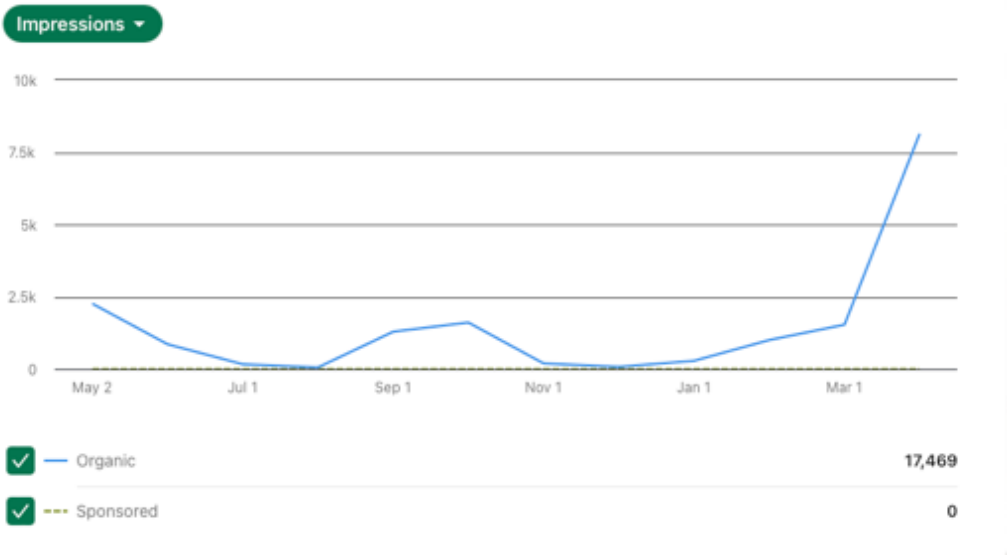

Figure 5: Impressions on the ARCADIAN-IoT LinkedIn page.

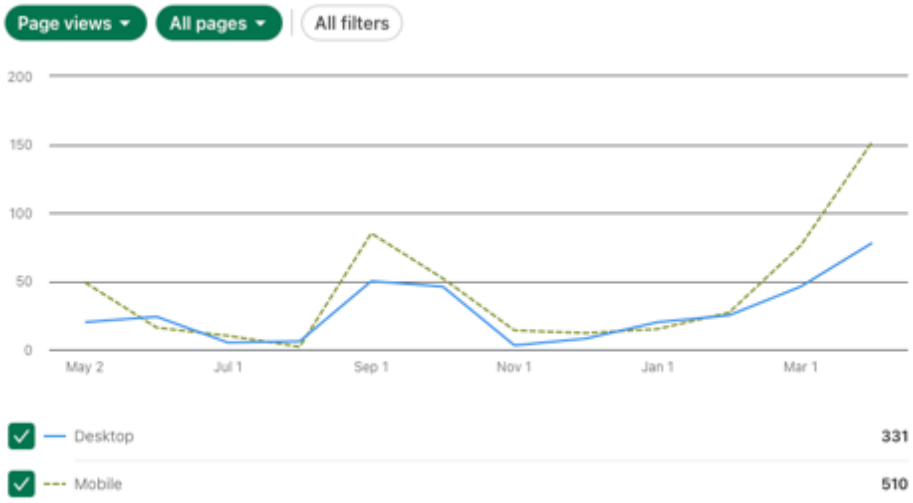

Figure 6: Page views for the ARCADIAN-IoT LinkedIn account.

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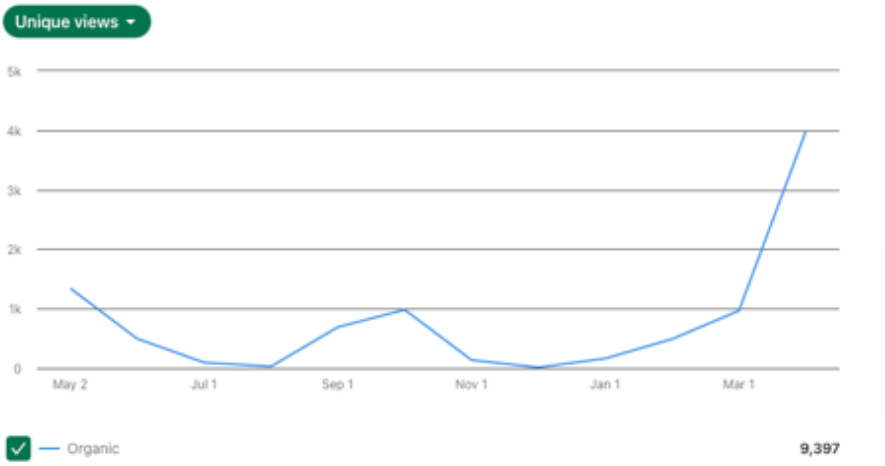

Figure 7: Unique views on the ARCADIN-IoT LinkedIn account.

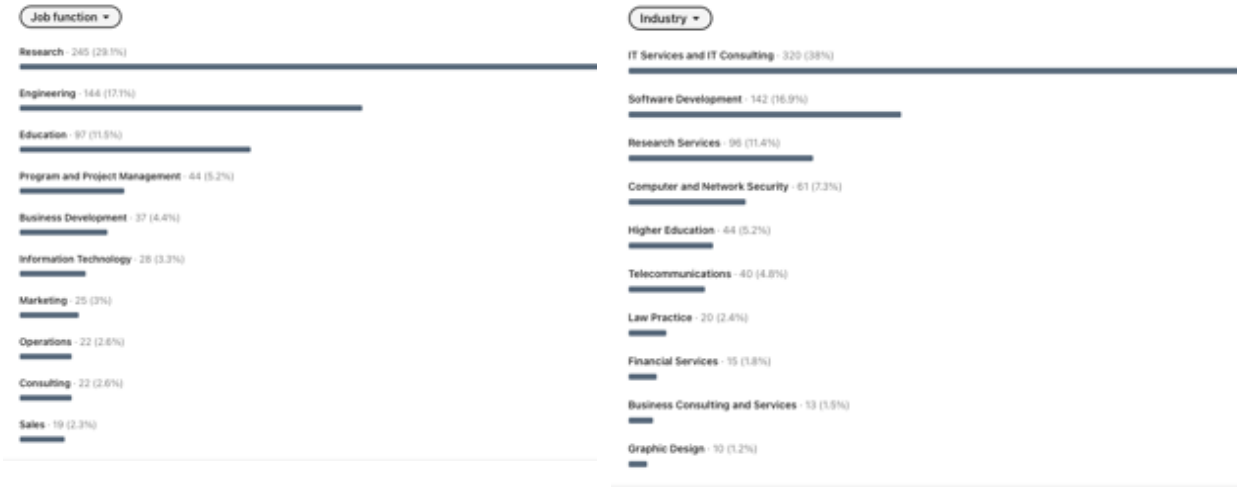

Figure 8: LinkedIn followers' profile based - jobs and industry.

3.4 YouTube

The YouTube channel was established in February 2022: https://www.youtube.com/channel/UCJRCUJktsmglj8ngQmPCavA. The YouTube channel has 60 subscribers. In the reporting period, the videos had 2,600 views in total and generated 20,300 impressions.

The channel featured the presentations ARCADIAN-IoT partners had at different events (webinars, workshops, training) but also the explainer videos related to the domains:

- Cyber Threat Intelligence – Empowering IoT Security Workshop: https://studio.youtube.com/video/9atadq5zsPA/edit
- Reputation System for Persons and IoT Devices: https://youtu.be/HS4MLtvqTz8
- SIM and cellular networks' roles in seamless IoT Authentication and Trust: https://youtu.be/yKPowhUVaG4
- Self-Sovereign Identity serving organisation, persons, and IoT Devices: https://youtu.be/dg6rHOrPtOw

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- Reputation System and Policy Manager: https://youtu.be/1D1mSwAPlVU
- Enabling remote attestation of heterogeneous devices in IoT services: https://youtu.be/Iyj7J-aPMys
- Hardened Encryption in ARCADIAN-IoT: protecting data at rest: https://youtu.be/ki-egDJOBRA
- ARCADIAN-IoT tools to facilitate user-driven data protection: https://youtu.be/mmqT36Ljd7A
- ARCADIAN-IoT technologies and data protection: AI systems, responsibilities, and facial recognition: https://youtu.be/_hB1DV6YscY
- Network self-protection loop: https://youtu.be/p_Ew9TzSILY
- Blockchain for securing IoT networks supporting medical services: https://youtu.be/BdAbWYkn39Q
- Multi factor authentication: https://youtu.be/ASanOCysHos
- Network based authentication: https://youtu.be/qvIwzG9NJic
- Biometrics: https://youtu.be/Fgmj27TJ84o
- Decentralised Identifiers (DIDs) used in the ARCADIAN-IoT platform: https://youtu.be/n4dNVSJrNu0
- Introduction to the ARCADIAN IoT framework: https://youtu.be/ZC-Dy-nVMik
- Cyber Threat Intelligence for IoT: https://youtu.be/PPZl93Zc0RQ
- Federated AI for cybersecurity: https://youtu.be/5z46g6w0cS0
- AI usage for intrusion detection in IoT devices: https://youtu.be/vTZLHh0CrMk
- The ARCADIAN-IoT framework and best practices in securing IoT devices: https://youtu.be/_ebylJdCXnE

3.5 Publications

In this Outreach Report, we will highlight the significant scientific publications produced by the ARCADIAN-IoT team, showcasing the cutting-edge research and innovations that are driving the development of secure, trustworthy, and privacy-centric IoT systems for various industries and applications.

Scientific publications in journals:

1. Han Wang, David Eklund, Alina Oprea, and Shahid Raza. 2023. FL4IoT: IoT Device Fingerprinting and Identification Using Federated Learning. ACM Trans. Internet Things 4, 3, Article 17 (August 2023), 24 pages. https://doi.org/10.1145/3603257
2. Gaspar, Diogo & Silva, Paulo & Silva, Catarina. (2024). Explainable AI for Intrusion Detection Systems: LIME and SHAP Applicability on Multi-Layer Perceptron. IEEE Access. PP. 1-1. 10.1109/ACCESS.2024.3368377.
3. Diez-Tomillo, J.; Alcaraz-Calero, J.M.; Wang, Q. Dynamic-Distance-Based Thresholding for UAV-Based Face Verification Algorithms. Sensors 2023, 23, 9909. https://doi.org/10.3390/s23249909
4. Diez-Tomillo, J., Martinez-Alpiste, I., Golcarenarenji, G. et al. Efficient CNN-based low-resolution facial detection from UAVs. Neural Comput & Applic 36, 5847–5860 (2024). https://doi.org/10.1007/s00521-023-09401-3
5. J. Diez-Tomillo, J. Alcaraz-Calero and Q. Wang, "Face Verification Algorithms for UAV Applications: An Empirical Comparative Analysis," in Journal of Communications Software and Systems, vol. 20, no. 1, pp. 1-12, January 2024, doi: 10.24138/jcomss-2023-0165
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10. Adaptive Robustness against Denial of Service in the Internet of Things. Rikard Höglund, Marco Tiloca, Shahid Raza. Under Review.
11. "Protecting IoT Data against Membership Inference Attack with Robust Synthetization in ML-based IDS". Han Wang, Seonghyun Kim, Luis Barriga, Alfonso Iacovazzi, Shahid Raza. ACM Transactions on Knowledge Discovery from Data. Under Review
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3. Enhancing Point Cloud Resolution for Autonomous Driving with Deep Learning AI Models. Javier Saez Perez, Qi Wang, Jose M. Alcaraz Calero, Jose Garcia Rodriguez. The 22nd International Conference on Pervasive Computing and Communications (PerCom 2024). Not yet published.
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5. Andrade-Hoz, J., Alcaraz-Calero, J. M., & Wang, Q. (Accepted/In press). Handling imbalanced 5G and beyond network tabular data using conditional generative models. In *Proceedings of the 20th International Wireless Communications & Mobile Computing Conference* IEEE. DOI: not available yet

Tutorials:

1. Reputation Systems in 5G/6G Networks. Bruno Sousa. IEEE IF/IP NOMS 2024. Link: https://noms2024.ieee-noms.org/tutorials

MSc an PhD Thesis supported through ARCADIAN-IoT

1. João Nunes, "Data Processing and Visualisation in Reputation Systems for Entities in IoT", September, 2023 (MSc Thesis – University of Coimbra)

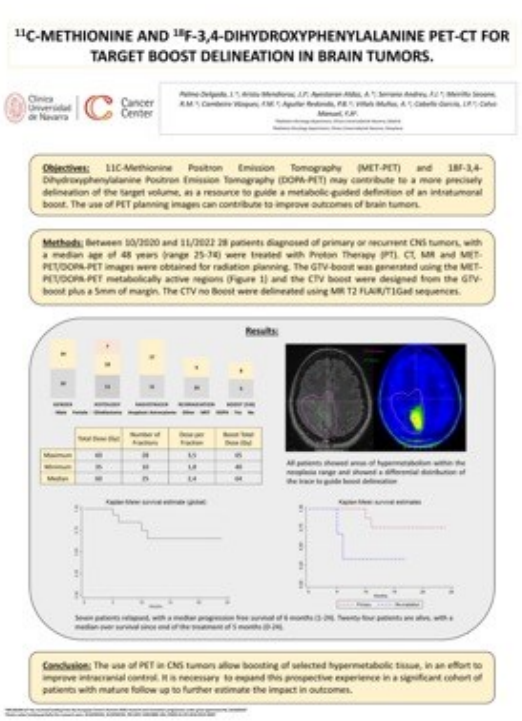
2. Daniel Vasconcelos, "Distributed Reputation Systems and Blockchain Data Storage", September, 2023 (MSc Thesis – University of Coimbra)
3. António de Ser, "IoT Device Functionality Attestation Mechanisms", September, 2022 (MSc Thesis – University of Coimbra)
4. Wang, H. (2023). Robust and Efficient Federated Learning for IoT Security (PhD dissertation, Acta Universitatis Upsaliensis). Retrieved from https://urn.kb.se/resolve?urn=urn:nbn:se:uu:diva-511774 (PhD Thesis – RISE).
5. Gaspar, José Diogo Caleiras. Explainable AI models for Transparent and Trustworthy Systems. MS thesis. 2023. (MSc Thesis – IPN)
6. Holubenko, Vitalina. Mecanismos Inteligentes para Monitoria e Deteção de Intrusões em Dispositivos IoT. MS thesis. 2022. (MSc Thesis – IPN)
7. Brás, Joana. Remote Attestation for IoT Services. 2024. (MSc Thesis – IPN)
8. Julio Diez-Tomillo, UAV-Based Face Verification, 2024 (PhD thesis – UWS)[1]
9. Angel Gama-Garcia, Process Slicing for Cybersecurity, 2024 (PhD thesis – UWS) **Error! Bookmark not defined.**
10. Javier Saez-Perez, Improving the Operation of Autonomous Vehicles, 2024 (PhD thesis – UWS) **Error! Bookmark not defined.**
11. Pablo Benlloch-Caballero, Self-protection and Self-healing for Cybersecurity, 2024 (PhD thesis – UWS) **Error! Bookmark not defined.**
12. Jimena Andrade-Hoz, Improving the Data-driven Autonomous Systems, 2024 (PhD thesis – UWS) **Error! Bookmark not defined.**
13. Mohamed Khadmaoui-Bichouna, Improving the Operation of 5G RAN, 2024 (PhD thesis – UWS) **Error! Bookmark not defined.**
14. Christopher Troy, Generative AI for Cybersecurity, 2024 (PhD thesis – UWS) **Error! Bookmark not defined.**

3.6 Promotional materials and posters

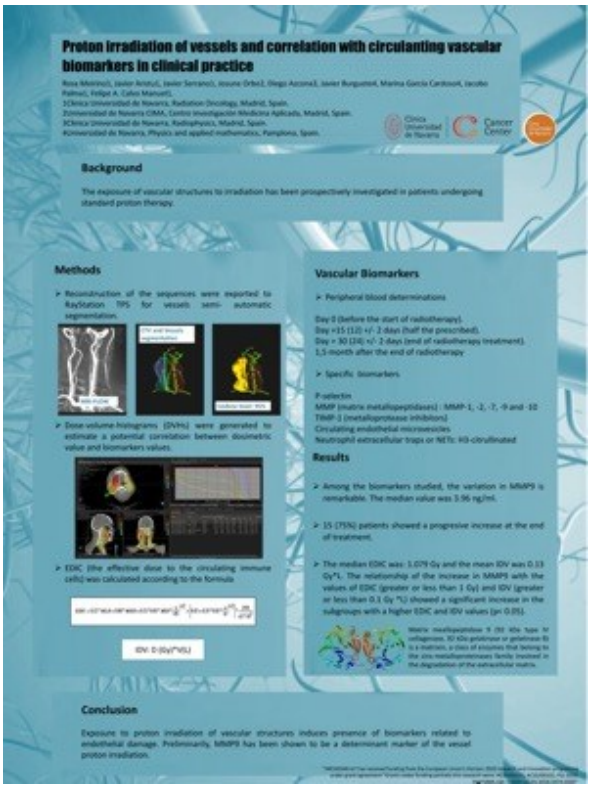
With the resumption of events with physical presence, the consortium produced the promotion materials and posters for the participation at different events, as well as scientific conferences.

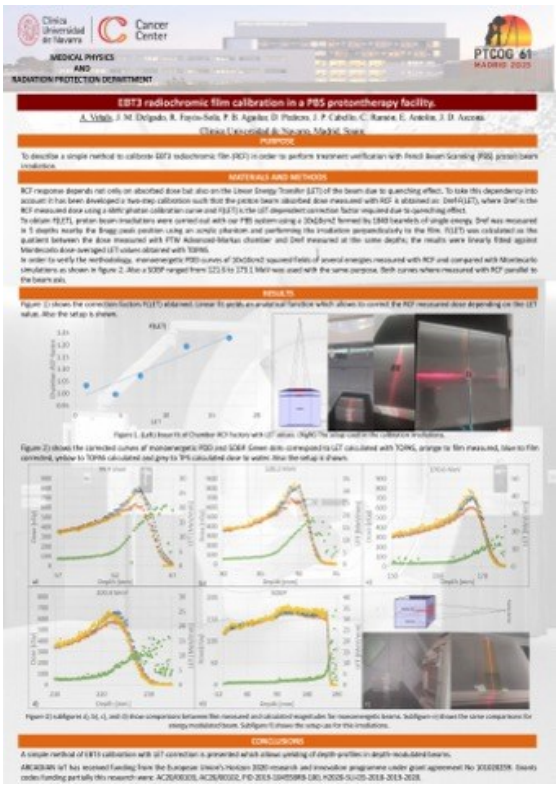
[1] PhD thesis work ongoing, and final title to be defined

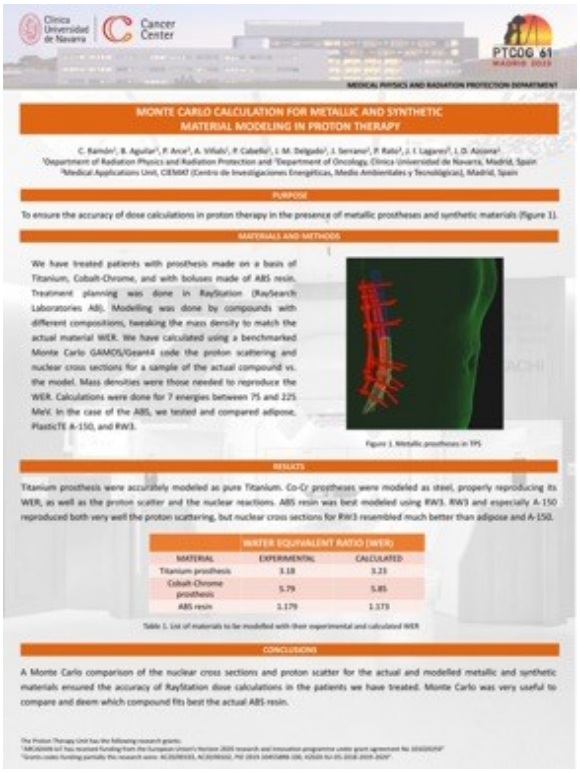
Figure 9: Posters presented at the ARCADIAN Symposium and Showcase.


11C-METHIONINE AND 18F-3,4-DIHYDROXYPHENYLALANINE PET-CT FOR TARGET BOOST DELINEATION IN BRAIN TUMORS.
Objectives:
Methods:
Results:
Conclusion:

A streamlined method for checking the output for all the beam energies available in a proton therapy synchrotron
PURPOSE:
MATERIALS AND METHODS:
RESULTS:
CONCLUSIONS:


Proton irradiation of vessels and correlation with circulanting vascular biomarkers in clinical practice
Background
Methods
Vascular Biomarkers
Results
Conclusion


EBT3 radiochromic film calibration in a PBS protontherapy facility.
PURPOSE
MATERIALS AND METHODS
RESULTS
CONCLUSIONS



MONTE CARLO CALCULATION FOR METALLIC AND SYNTHETIC MATERIAL MODELING IN PROTON THERAPY

C. Ramón[1], B. Aguilar[1], P. Arce[1], A. Viñals[1], P. Cabello[1], I. M. Delgado[1], J. Serrano[1], P. Ratia[1], J. I. Lagares[1], J. D. Azcona[2]
[1]Department of Radiation Physics and Radiation Protection and [2]Department of Oncology, Clínica Universidad de Navarra, Madrid, Spain
[3]Medical Applications Unit, CIEMAT (Centro de Investigaciones Energéticas, Medio Ambientales y Tecnológicas), Madrid, Spain

PURPOSE

To ensure the accuracy of dose calculations in proton therapy in the presence of metallic prostheses and synthetic materials (figure 1).

MATERIALS AND METHODS

We have treated patients with prosthesis made on a basis of Titanium, Cobalt-Chrome, and with boluses made of ABS resin. Treatment planning was done in RayStation (RaySearch Laboratories AB). Modelling was done by compounds with different compositions, tweaking the mass density to match the actual material WER. We have calculated using a benchmarked Monte Carlo GAMOS/Geant4 code the proton scattering and nuclear cross sections for a sample of the actual compound vs. the model. Mass densities were those needed to reproduce the WER. Calculations were done for 7 energies between 75 and 225 MeV. In the case of the ABS, we tested and compared adipose, PlasticTE A-150, and RW3.

Figure 1. Metallic prostheses in TPS

RESULTS

Titanium prosthesis were accurately modeled as pure Titanium. Co-Cr prostheses were modeled as steel, properly reproducing its WER, as well as the proton scatter and the nuclear reactions. ABS resin was best modeled using RW3. RW3 and especially A-150 reproduced both very well the proton scattering, but nuclear cross sections for RW3 resembled much better than adipose and A-150.

WATER EQUIVALENT RATIO (WER)

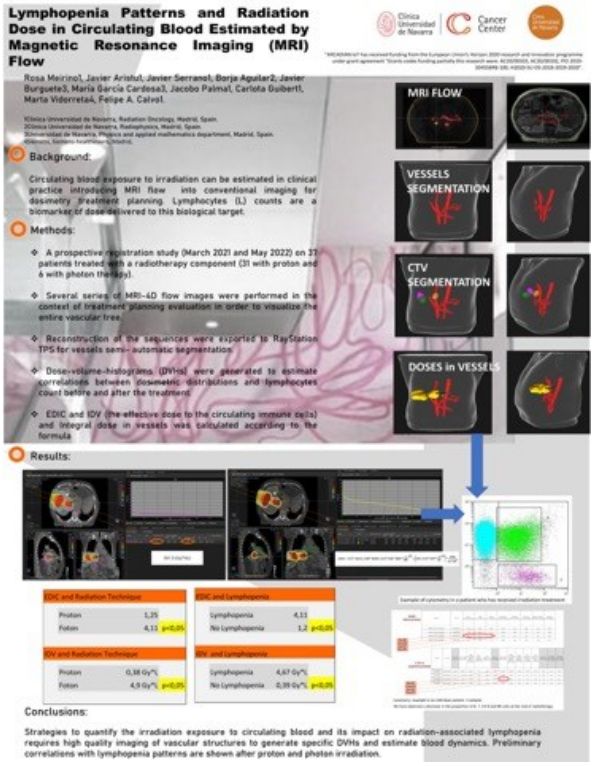
MATERIAL	EXPERIMENTAL	CALCULATED
Titanium prosthesis	3.18	3.23
Cobalt-Chrome prosthesis	5.79	5.85
ABS resin	1.179	1.173

Table 1. List of materials to be modelled with their experimental and calculated WER

CONCLUSIONS

A Monte Carlo comparison of the nuclear cross sections and proton scatter for the actual and modelled metallic and synthetic materials ensured the accuracy of RayStation dose calculations in the patients we have treated. Monte Carlo was very useful to compare and deem which compound fits best the actual ABS resin.

The Proton Therapy Unit has the following research grants:
[1]ARCADIAN-IoT has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101016509
[2]Grants codes funding partially this research were: RC2020/0020, RC2019/0032, PID 2019-104488RB-100, H2020-EU.3.5.-2018-2019-2020



Lymphopenia Patterns and Radiation Dose in Circulating Blood Estimated by Magnetic Resonance Imaging (MRI) Flow

Rosa Meirinol, Javier Arishul, Javier Serranol, Borja Aguilar2, Javier Burguete3, María García Cardosa3, Jacobo Palmal, Carlota Guibertl, Marta Vidorreta4, Felipe A. Calvol.

[1]Clínica Universidad de Navarra, Radiation Oncology, Madrid, Spain
[2]Clínica Universidad de Navarra, Radiophysics, Madrid, Spain
[3]Universidad de Navarra, Physics and applied mathematics department, Madrid, Spain.
[4]Siemens Healthineers, Madrid.

*ARCADIAN-IoT has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement [illegible]

Background:

Circulating blood exposure to irradiation can be estimated in clinical practice introducing MRI flow into conventional imaging for dosimetry treatment planning. Lymphocytes (L) counts are a biomarker of dose delivered to this biological target.

Methods:

- A prospective registration study (March 2021 and May 2022) on 37 patients treated with a radiotherapy component (31 with proton and 6 with photon therapy).
- Several series of MRI-4D flow images were performed in the context of treatment planning evaluation in order to visualize the entire vascular tree.
- Reconstruction of the sequences were exported to RayStation TPS for vessels semi- automatic segmentation.
- Dose-volume-histograms (DVHs) were generated to estimate correlations between dosimetric distributions and lymphocytes count before and after the treatment.
- EDIC and IDV (the effective dose to the circulating immune cells) and integral dose in vessels was calculated according to the formula

MRI FLOW
VESSELS SEGMENTATION
CTV SEGMENTATION
DOSES in VESSELS

Results:

EDIC and Radiation Technique	
Proton	1,25
Foton	4,11 p=0,05

EDIC and Lymphopenia	
Lymphopenia	4,11
No Lymphopenia	1,2 p=0,05

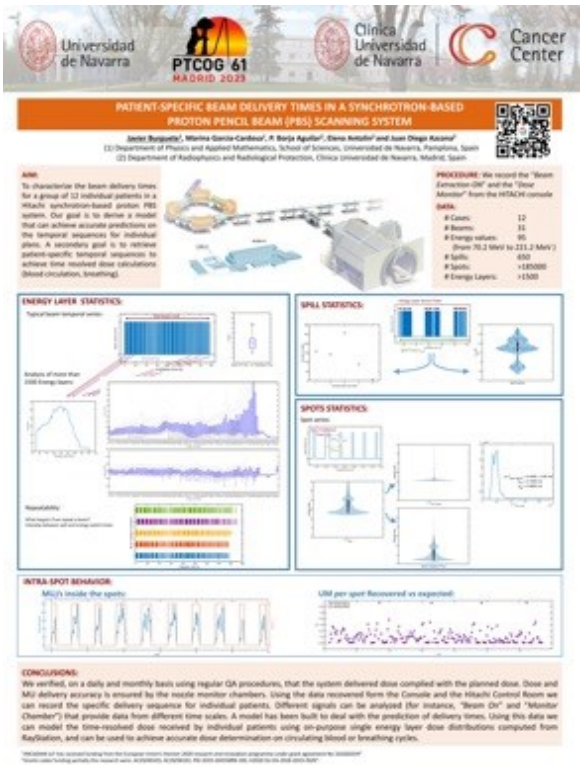
IDV and Radiation Technique	
Proton	0,38 Gy*L
Foton	4,9 Gy*L p=0,05

IDV and Lymphopenia	
Lymphopenia	4,67 Gy*L
No Lymphopenia	0,39 Gy*L p=0,05

Example of symmetry in a patient who has received irradiation treatment

Conclusions:

Strategies to quantify the irradiation exposure to circulating blood and its impact on radiation-associated lymphopenia requires high quality imaging of vascular structures to generate specific DVHs and estimate blood dynamics. Preliminary correlations with lymphopenia patterns are shown after proton and photon irradiation.



PATIENT-SPECIFIC BEAM DELIVERY TIMES IN A SYNCHROTRON-BASED PROTON PENCIL BEAM (PBS) SCANNING SYSTEM

Javier Burguete[1], Marina García-Cardosa[2], P. Borja Aguilar[2], Elena Antolín[2] and Juan Diego Azcona[2]
(1) Department of Physics and Applied Mathematics, School of Sciences, Universidad de Navarra, Pamplona, Spain
(2) Department of Radiophysics and Radiological Protection, Clínica Universidad de Navarra, Madrid, Spain

AIM:

To characterize the beam delivery times for a group of 12 individual patients in a Hitachi synchrotron-based proton PBS system. Our goal is to derive a model that can achieve accurate predictions on the temporal sequences for individual plans. A secondary goal is to retrieve patient-specific temporal sequences to achieve time resolved dose calculations (blood circulation, breathing).

PROCEDURE: We record the "Beam Extraction ON" and the "Dose Monitor" from the HITACHI console

DATA:

# Cases:	12
# Beams:	31
# Energy values: (from 70.2 MeV to 221.2 MeV)	95
# Spills:	650
# Spots:	>185000
# Energy Layers:	>1500

ENERGY LAYER STATISTICS:

SPILL STATISTICS:

SPOTS STATISTICS:

INTRA-SPOT BEHAVIOR:

MU/s inside the spots

MU per spot Recovered vs expected

CONCLUSIONS:

We verified, on a daily and monthly basis using regular QA procedures, that the system delivered dose complied with the planned dose. Dose and MU delivery accuracy is ensured by the nozzle monitor chambers. Using the data recovered form the Console and the Hitachi Control Room we can record the specific delivery sequence for individual patients. Different signals can be analyzed (for instance, "Beam On" and "Monitor Chamber") that provide data from different time scales. A model has been built to deal with the prediction of delivery times. Using this data we can model the time-resolved dose received by individual patients using on-purpose single energy layer dose distributions computed from RayStation, and can be used to achieve accurate dose determination on circulating blood or breathing cycles.

*ARCADIAN-IoT has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101016509
[2]Grants codes funding partially this research were: RC2020/0020, RC2019/0032, PID 2019-104488RB-100, H2020-EU.3.5.-2018-2019-2020

LYMPHOPENIA PATTERN DURING PHOTON VS PROTON CRANIOSPINAL IRRADIATION FOR MEDULOBLASTOMA.

[illegible]

Objectives: Analyze variations in lymphocyte counts in medulloblastoma pediatric patients (p) using proton or photon craniospinal irradiation (CSI).

Methods: Two consecutive pediatric cohorts from two institutions were prospectively registered and retrospectively analyzed. All p were treated with conformal-3D photon radiotherapy (3DCRT) or pencil-beam scanning protontherapy (PBSPT) under identical protocol. Patients received between 23.4-39.6 Gy CSI (median=36 Gy) and 54-59.4 Gy boost (median=55.8 Gy) using daily 1.8 Gy fractions. Complete blood test including lymphocyte values were obtained pre, during and after CSI completion. Platelets were transfused if <30.000 and GCSF if <1.000 neutrophil count.

Results:

Organ at risk	Proton	Photon
Thoracic aorta	36,11 cm³	44,55 cm³
Heart	28,72 cm³	292,55 cm³
Liver	28,75 cm³	612,66 cm³
Body integral dose	5902,95 cm³	13488,71 cm³

Table 1. Comparative volumes that received lymphocyte lethal doses (V_{lethal}) in following structures using protons Vs photons.

PROTONS

PROTONS

PROTONS

PROTONS

	Proton	Photon	p
Mean lymphocytes count	317 per mm³	461 per mm³	0,005
Minimum lymphocytes count	155 per mm³	170 per mm³	0,053

Table 2. Statistically significant protective was observed on mean and minimum lymphocytes count in favor of proton group.

Conclusion: Proton PBSPT CSI significantly preserve from lymphopenia in medulloblastoma pediatric patients compared to photon 3DCRT.

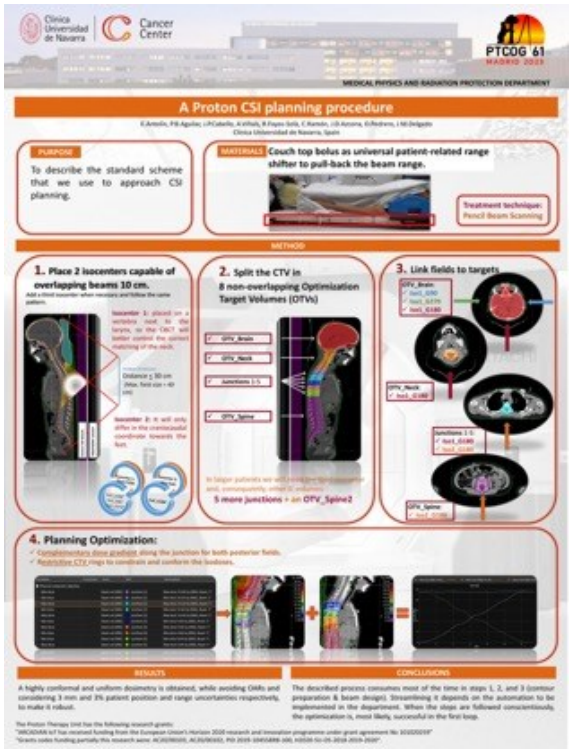


Figure 10: Conference posters from ARCADIAN-IoT.

3.7 Newsletter

ARCADIAN-IoT produced e-newsletters and newsflashes, which provided regular updates on the project, future events, as well as news from project partners and stakeholders upon subscription and news availability. In the reporting period, three editions were developed and distributed. The ARCADIAN-IoT e-Newsletters are uploaded to the project website: https://www.arcadian-iot.eu/newsletter/

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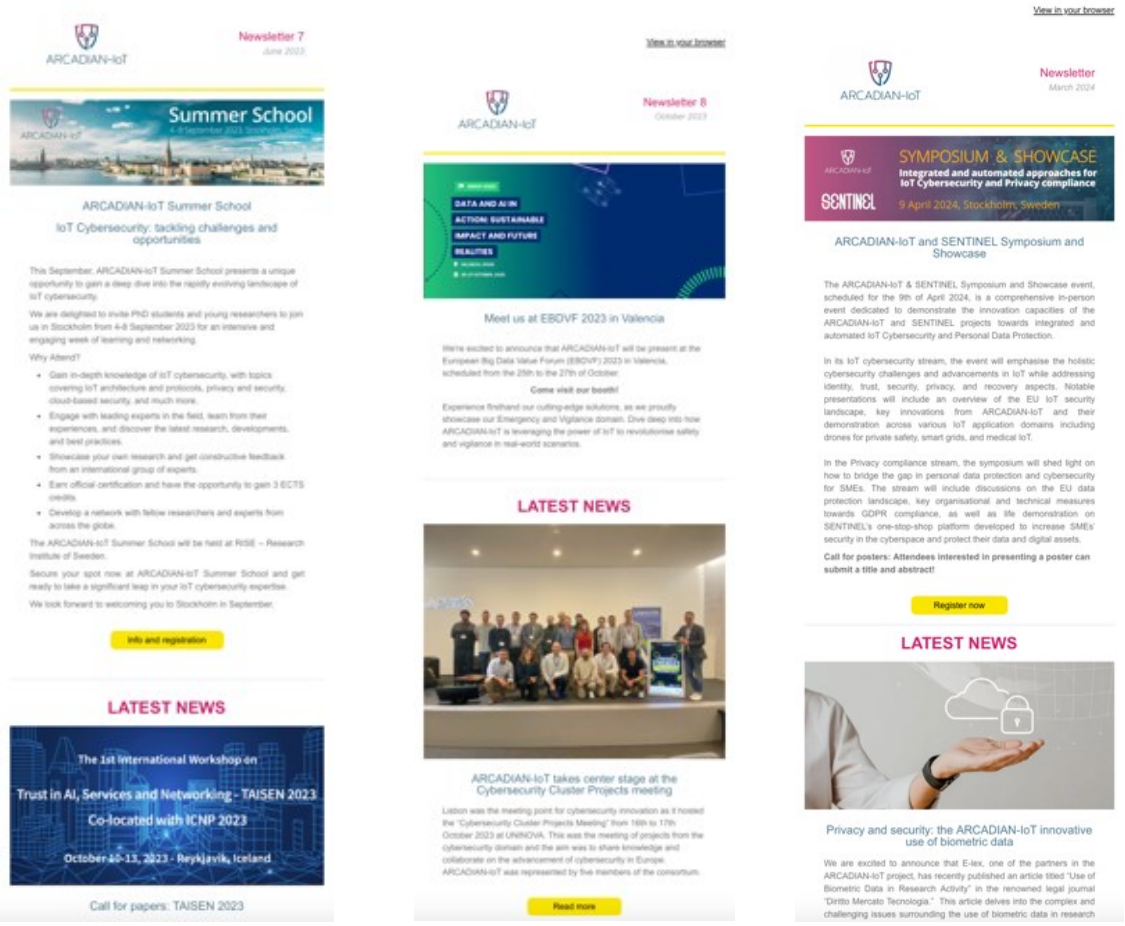

Figure 11: ARCADIAN-IoT Newsletters.

3.8 Media Relations and Engagement

In the reporting period, three press releases was distributed. The press releases were releated to the activities within the project:

- Summer School on IoT Cybersecurity to be held in Stockholm at RISE: https://www.arcadian-iot.eu/wp-content/uploads/sites/76/2023/06/summer-school-on-iot-cybersecurit.pdf
- Joint Efforts Unveiled: “SecureCyber Cluster – Enhancing Cybersecurity” spearheads collaborative approach in cybersecurity: https://www.arcadian-iot.eu/wp-content/uploads/sites/76/2024/01/1706257010529.pdf
- ARCADIAN-IoT and SENTINEL projects showcase the future of IoT cybersecurity and data privacy at upcoming symposium: https://www.arcadian-iot.eu/wp-content/uploads/sites/76/2024/05/arcadian-iot-and-sentinel-project.pdf

Another press release is scheduled in April/May to announce the results of the project.

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3.9 Events

During the reporting period, ARCADIAN-IoT and its project partners organised and participated several events (online and in-person) where they presented the activities or contributed to topic related to cybersecurity.

1. **RISE Computer Science and AI Open House (14 September 2023, in-person)**

RISE organised and participated in this event where ARCADIAN-IoT project was presente. The event was dedicated to presenting the latest research in AI, cybersecurity, IoT, data centers, and more. On behalf of ARCADIAN-IoT, RISE presented posters on Federated Learning and Cyber Threat Intelligence components.

2. **EBDVF 2023 (25-27 October 2023, in-person)**

ARCADIAN-IoT participated with a booth to the EBDVF 2023 event, which took place in Valencia, Spain on 25-27 October 2023. ARCADIAN-IoT partner, LOAD, showcased the Emergency and Vigilance Domain and the Drone Guardian Angel application. Over the three days, the event gathered 1,500 attendees.

Snapshots from the event: https://twitter.com/ArcadianIoT/status/1717477117015761054

Figure 12: ARCADIAN-IoT booth at the EBDVF 2023

3. **MEDICA Trade Fair 2023 (13-16 November 2023)**

RGB Medical participated in MEDICA Trade Fair, the world's largest event for the medical sector, that took place in Dusseldorf, Germany in November 2023. This is the most important international Fair in the world, with over 175.000 visitors. RGB has presented the ARCADIAN project though flyers and videos.

4. ARCADIAN-IoT Webinar Series

Securing IoT Devices: Best Practices and Emerging Technologies (9 June 2023, online): The webinar commenced with a welcome address by Sérgio Figueiredo, the project coordinator of ARCADIAN-IoT and then delved into topics such as "AI usage for intrusion detection in IoT devices" (IPN), "Federated AI for cybersecurity" (RISE), and "Cyber Threat Intelligence for IoT" (RISE). Agenda of the event: https://www.arcadian-iot.eu/event/arcadian-iot-webinar-series-building-a-secure-iot-ecosystem/. The webinar gathered 31 participants.

Figure 13: Securing IoT Devices: Best Practices and Emerging Technologies.

Privacy and Data Protection in IoT Systems (6 October 2023, online): This event focused on privacy and data protection mechanisms in IoT systems. Discussions covered privacy-by-design, data minimization, compliance with data protection regulations, and the importance of user awareness in maintaining privacy. Presentations included "ARCADIAN-IoT technologies and data protection: AI systems, responsibilities and facial recognition" (E-lex), "ARCADIAN-IoT tools to facilitate user-driven data protection" (MARTEL), and "Hardened Encryption in ARCADIAN-IoT: protecting data at rest" (X-LAB). Agenda of the event: https://www.arcadian-iot.eu/event/arcadian-iot-webinar-series-privacy-and-data-protection-in-iot-systems/. The event gathered 31 participants.

Identity and trust in IoT ecosystems provided by ARCADIAN-IoT (14 february 2024, online): The webinar explored the evolving landscape of trust and identity verification within the Internet of Things (IoT) ecosystems. Presentation included "Introduction to the chain of trust" (IPN), "Self-Sovereign Identity serving organisation, persons and IoT Devices" (EVIDEN), "SIM and cellular networks' roles in seamless IoT Authentication and Trust" (1GLOBAL), and "Reputation System for persons and IoT Devices" (University of Coimbra). The agenda of the event: https://www.arcadian-iot.eu/event/identity-and-trust-in-iot-ecosystems-provided-by-arcadian-iot/. The event gathered 28 participants.

IoT Security in Key Industry Sectors (30 April 2024, online): In this webinar, ARCADIAN-IoT partners presented three key domains where the project is driving innovation: Medical IoT (RGB), Emergency & Vigilance (LOAD), and Industrial Control Systems (BOX2M). The agenda of the event: https://www.arcadian-iot.eu/event/arcadian-iot-webinar-series-iot-security-in-key-industry-sectors/ The event gathered 23 participants.

5. ARCADIAN-IoT Trainings

The ARCADIAN-IoT Trainings for ICT-users and non-ICT users are organised as part of the WP5 (details in D5.7), but WP6 provided support in the organisation of these events. In addition, the trainings are hosted on the ARCADIAN-IoT website and Youtube channel: https://www.arcadian-iot.eu/trainings/

6. ARCADIAN-IoT Summer School (4-8 September 2023, in person)

The week-long ARCADIAN-IoT Summer School, hosted from 4th to 8th September, offered participants an in-depth dive into the realm of Internet of Things (IoT) security, providing insights into the latest research, techniques, and challenges in the field. Initiated by a warm welcome from Alfonso Iacovazzi of RISE Research Institutes of Sweden, the event set the tone by introducing the ARCADIAN-IoT project, spearheaded by Sérgio Figueiredo of Instituto Pedro Nunes. One of the standout presentations was by Shahid Raza, also from RISE, who shed light on the evolving feasibility of asymmetric cryptography for IoT. The discourse underscored the importance of automated, lightweight re-certification methods in the face of constant software updates, especially concerning the EU Cybersecurity Act. João Casal from 1GLOVAL elaborated on the increasing role of eSIM and Programmable Networks in IoT cybersecurity, indicating the potential of these technologies in ensuring a more secure digital environment. The trend of cyber threats,

both from traditional and emerging technologies, was adeptly addressed by Mauro Conti from the University of Padua, emphasizing the covert and side channels threats.

The Summer School also offered hands-on tutorials like Contiki-NG Cybersecurity, led by Nicolas Tsiftes and Joakim Eriksson from RISE. Participants got hands-on experience with real IoT platforms and the Cooja simulator. Other highlights included Andrei Sabelfeld's talk from Chalmers University on the security and privacy of IoT apps. Andreas Kurth from lowRISC delved into the promising realm of open-source silicon for security applications, emphasizing its advantages over proprietary models. Interactive sessions, such as the Ethical Hacking workshop by Gustav Midéus, Alexios Stournaras, and Erik Mickols, engaged participants in practical hacking scenarios, enhancing the understanding of cybersecurity from an attacker's perspective. By the end of the week, participants had traversed a gamut of topics from Lightweight Cryptography with Maria Eichlseder to IoT Protocols for Constrained Networks by Marco Tiloca.

On the final day, Kai Rannenberg from Goethe University Frankfurt provided a comprehensive overview of the challenges and considerations for security and privacy in the age of IoT, culminating in a captivating talk by Stewart Kowalski from the Norwegian University of Science and Technology on the Socio-Technical Modeling of IoT Security Eco-Systems.

Page of the event: https://www.arcadian-iot.eu/summerschool/

Figure 14: Participants at the ARCADIAN-IoT Summer School

7. ARCADIAN-IoT and SENTINEL projects Symposium and Showcase (9 April 2024, in-person)

The ARCADIAN-IoT and SENTINEL projects held a successful Integrated and Automated Approaches for IoT Cybersecurity and Privacy Compliance Symposium and Showcase on April 9th, 2024 in Stockholm, Sweden. The event, hosted by RISE Research Institutes of Sweden,

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brought together experts to demonstrate the latest innovations in IoT cybersecurity and personal data protection.

The morning session kicked off with insights from Juuso Stenfors of the European Commission on the afterlife of European projects. It then split into two streams – one focused on holistic IoT cybersecurity, and the other on security and data protection for SMEs.

The IoT cybersecurity stream provided an overview of the EU IoT security landscape from Shahid Raza of RISE. Sérgio Figueiredo, coordinator of ARCADIAN-IoT, discussed enabling holistic cybersecurity for IoT. Real-world applications were also highlighted, with presentations on drones for private safety, smart grids, and medical IoT.

In the data privacy stream, the EU data protection landscape and challenges were examined by experts from the SENTINEL project. The SENTINEL project's one-stop-shop platform for increasing SME cybersecurity and data protection was demonstrated.

Eva Fogelström of Ericsson delivered a keynote address. This was followed by a panel discussion on the European research and industry landscape for cybersecurity and data privacy. The panelists included representatives from ARCADIAN-IoT, SENTINEL, Ericsson, E-lex and the SECURED project.

Figure 15: ARCADIAN-IoT and SENTINEL projects Symposium and Showcase

8. AI, Medical Devices and Data Protection (23 April, online)

E-Lex Law Firm, partner of ARCADIAN-IoT, organised an online workshop entitled “AI, Medical Devices & Data Protection”. Keynote speakers inlcuded Luigi Montuori, Director of the Health and Research Department of the Italian Garante per le protezione dei dati personali, Valeria Glorioso, Director of the “Confindustria medical devices” Study Center, Italo Cerno, Global Data Protection Officer of Angelini Pharma; Giovanni Stracquadaneo, COO of Omzey, a company active in genome analysis; Ricardo Nolasco Ruiz, of RGB Medical Devices. The workshop was moderated by Prof. Giovanni Maria Riccio, partner of E-Lex. Agenda of the event: https://www.arcadian-iot.eu/event/ai-medical-devices-data-protection/. The event gathered 50 participants.

Figure 16: Poster of the AI, medical devices and data protection webinar.

3.9.1 Cyberwatching.EU Project Radar

As part of the dissemination activities, ARCADIAN-IoT is now present on the Cyberwatching.EU Project Radar. The radar provides an interactive “birds-eye” view of the complete collection of EU funded projects in the cybersecurity space landscape. Targetting researchers, policy makers and SMEs, the tool zooms in on technology and vertical sectors. The tool enables the finding of results, projects and partners and understanding of the market readiness levels of project results.

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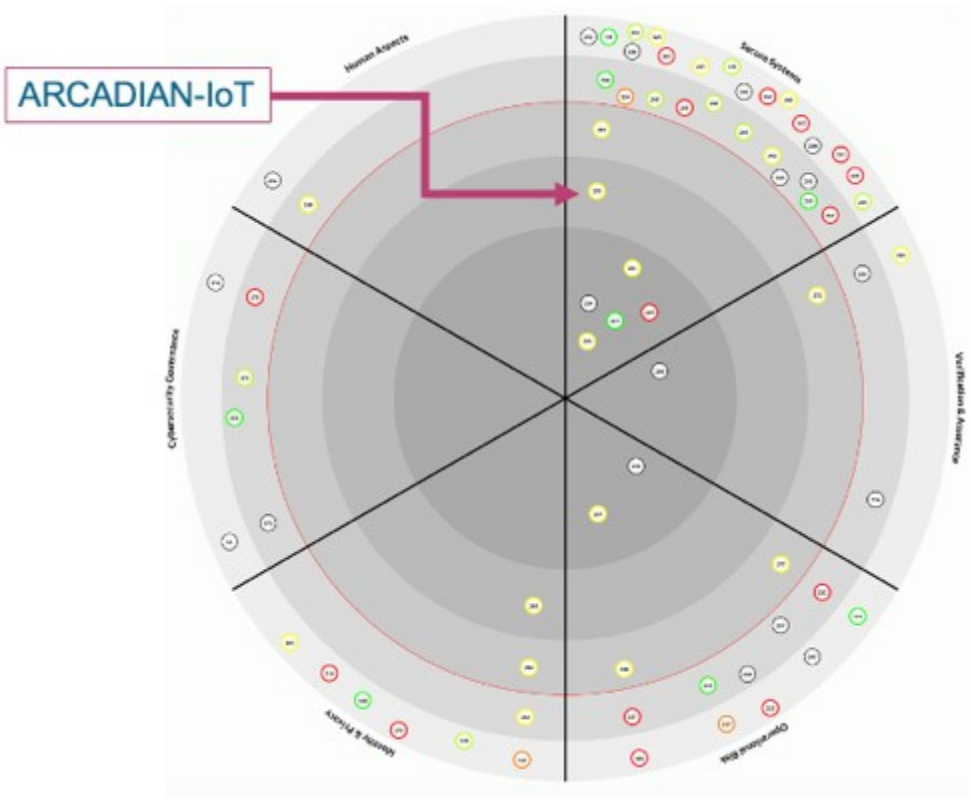

Figure 17: Cyberwatching.EU Project Radar.

4 SYNERGIES WITH OTHER PROJECTS AND INITIATIVES

In Task 6.4, ARCADIAN-IoT's goals was to create synergies with other initiatives. To this end, we reached out to other EC-funded projects and organisations, informing them about ARCADIAN-IoT's aims and objectives and inviting them to share information on their project with us. Below is a list of the projects approached for collaboration.

4.1.1 Communication Task Force

In line with T6.4 - Synergies and interaction with external initiatives, ARCADIAN-IoT initiated and organised the Communication Task Force (CTF) that gathers the projects funded under the same call - H2020 SU-DS02-2020.

This Communication Task Force (CTF) has been set up by WP6 to address specific plans and activities around communication and dissemination. The main objective of the CTF was to coordinate and create synergies to amplify outreach and increase the impact of activities.

During the reporting period, ARCADIAN-IoT organised 12 monthly meetings with the communication and dissemination specialists from the other cluster project.

To promote the activities of the cluster several actions were taken:

1. **SecureCyber Cluster – enhancing cybersecurity LinkedIn page** (https://www.linkedin.com/company/securecyber-cluster-–enhancing-cybersecurity) with a distinct visual identify where each project in the cluster can publish news, upcoming events.

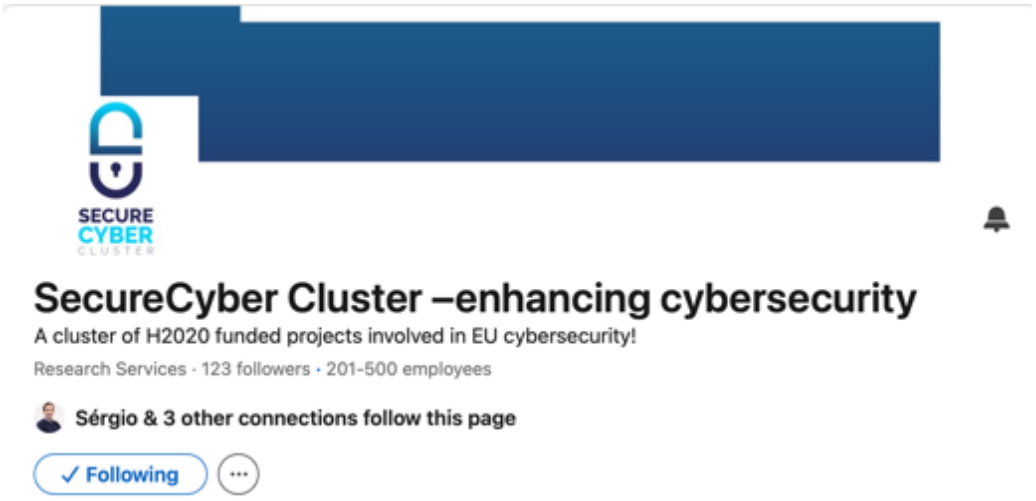

Figure 18: SecureCyber Cluster LinkedIn page

2. **SecureCyber Cluster Newsletter** – the cluster publishes a monthlt newsletter which provides updates from each project. Until April 2024, the cluster published four newsletters:

Newsletter 1: https://www.linkedin.com/feed/update/urn:li:activity:7153659042471501825

Newsletter 2: https://www.linkedin.com/feed/update/urn:li:activity:7163815608919216132

Newsletter 3: https://www.linkedin.com/feed/update/urn:li:activity:7176495269591584769

Newsletter 4: https://www.linkedin.com/feed/update/urn:li:activity:7186679875318013952

4.2 Joint events

In the reporting period, the cluster held an in-person meeting in Lisbon, organised by ARCADIAN-IoT and SENTINEL project. The meeting was dedicated to identifying collaboration opportunities and to organising one training session.

1. **Cyber Security and Data Protection (17 October 2023, in-person):**

This event the public had the opportunity to engage with professionals and learn about the different components developed within the projects. The topic covered “Cyberrange for security professionals training” (SECANT project), “Integrating Blockchain with IoT for Secure and Scalable Decentralised Identity Management” (ERATOSTHENES project), “Enabling Remote attestation of heterogeneous devices in IoT services” (ARCADIAN-IoT project), Reputation System and Policy Manager (ARCADIAN-IoT project), “Modelling and recording your personal data processing activities for GDPR compliance” (SENTINEL Project).

Figure 19: Cluster projects meeting in Lisbon.

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2. **Cyber Threat Intelligence: Empowering IoT Security Workshop (6 March 2024, online)**

Figure 20: Cyber Threat Intelligence: Empowering IoT Security Workshop.

This workshop focused on the efforts of multiple EU-funded projects that have developed a Cyber Threat Intelligence (CTI) component, with a specific emphasis on IoT systems. The goal of this workshop was to equip participants with the skills and knowledge to gather, produce, elaborate, and share critical information about cyber threats and attacks, especially in IoT environments. The workshop also focused on how CTI can be seamlessly incorporated into several vertical industries, addressing industry-specific challenges and needs. The workshop consisted of presentations and demos.

Agenda of the event: https://www.arcadian-iot.eu/event/cyber-threat-intelligence-empowering-iot-security-workshop/

Recording of the workshop: https://www.youtube.com/watch?v=9atadq5zsPA&t=11s

The event gathered 73 participants.

4.3 Cluster White Paper

The SecureCyber Cluster is working also on a White Paper titled "**6G-enabled IoT**", coordinated by SPATIAL project. The paper will begins with an introduction providing an overview of 6G, IoT, and their evolution. It then delves into the security and privacy challenges faced in 6G and IoT deployments across various application domains such as smart homes, energy systems, manufacturing, healthcare, and smart cities. The White Paper will highlight several contributions from ARCADIAN-Iot to addressing these challenges. The White Paper aims to provide a forward-looking perspective on the future implications and opportunities of these technologies, with contributions from various research projects.

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4.4 Horizon Results Booster

Together with the Cluster projects, ARCADIAN-IoT applied to the Horizon Results Booster – Module A - Identifying and creating the portfolio of R&I project results.

This module supported the creation of a portfolio of results that are suitable for joint dissemination. It also included a comprehensive mapping of the relevant stakeholders/target audience for each particular portfolio.

The analysis was used to create a common dissemination plan thate take into account the recommendation from the service: use of social media channels, press releases, newsletters, presentations, demos (as descibed in the above sections).

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5 IMPACT CREATION MONITORING

5.1 Dissemination and Communication KPIs

The following metrics are used to monitor and assess the progress of the dissemination and communication activities and provide some measurable outcomes related to their impact created (as far as this is feasible from a quantitative point of view).

Table 1: Dissemination and Communication KPIs

Measure	Indicators and Target (M36)	Results at M36
Flyers Posters / roll-ups	*Nº of flyers *:* 6 *Nº of posters/roll-ups *:* 4	6 4 roll-ups/14 posters
Project Website	*Nº of unique visitors to the website:* 1,500 (average per year)	4,000
Social Networks	*Nº followers on Twitter:* 300 *Nº followers on LinkedIn:* 200 *Nº of views on YouTube:* 300	*Nº followers on Twitter:* 484 *Nº followers on LinkedIn:* 315 *Nº of views on YouTube:* 3,240
Press Releases* / publication in press*	*Nº of press releases issued to specialized and general media channels:* 6	5 press releases Another planned for May 2024
Videos	*Nº of videos published on the project website and social media:* 3 videos per year *Average number of views:* 60 views /video	Nº of videos: 26 Average number of views: 124
Participation to events and presentations	*Nº of external events partners attended to promote the project:* at least 4 events per year	15
Workshops (2)	*Average Nº of participants: At least 30 participants each*	3 workshops with 70 participants (average)
Cybersecurity Training (6, 2 per use case)	*Average Nº of participants:* At least 20 participants each	6 Trainings, 2 per use case 29 average participants per training
4 thematic webinars in (M20,24,30,36)	*Average Nº of participants:* At least 50	5 thematic webinars organised Average number of participants: 33
Scientific publications	*Nº of peer-reviewed publications in journals:* At least 10. *Nº of peer-reviewed publications in conferences and workshops:* At least 14	21 13
Newsletters	*Nº of newsletters: 9 (every 4*	12

	months)	
Summer School (1, M32-M36).	*Nº of participants:* At least 25 participants	Summer School 4-8 September 2023 hosted by RISE Number of participants: 40

5.2 Dissemination and Communication Deliverables and Milestones

Table 2: ARCADIAN-IoT Communication Deliverables.

No	Deliverable name	Lead	Type	Level	Delivery date (in months)	Status at M12
D6.1	Dissemination and communication strategy and plan	MAR	PU	R	M03	Submitted
D6.4	Outreach activities report	MAR	PU	R	M12	Submitted
D6.7	Outreach activities report	MAR	PU	R	M24	Submitted
D6.8	Outreach activities report	MAR	PU	R	M36	Submitted

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6 CONCLUSIONS

The outreach activities reported from M25 to M36 have demonstrated success and progress in disseminating the activities of ARCADIAN-IoT. This report has summarized these efforts, showcasing the broad strategies implemented to communicate the project's objectives and results.

The project successfully used multiple communication platforms, including social media, web portals, and direct engagement through events and publications, to enhance visibility and impact.

Significant achievements include:

- **Strengthened online presence**: The project's robust strategy in maintaining and updating its websire and active engagement on social media channels like Twitter, LinkedIn, and YouTube significantly expanded its reach.
- **Impactful publications**: The wide array of scientific publications produced by the project contributed valuable knowledge to the field of IoT security and privacy.
- **Community building and trainings**: Through various workshops, conferences, and the ARCADIAN-IoT Summer School, the project not only disseminated its findings but also gathered insights from external experts.

The ARCADIAN-IoT project has exceeded many of its dissemination and communication objectives.

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