D8.1: Dissemination and Communication Strategy and Plan

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Abstract	This document presents a sound and well-articulated communication strategy that has been developed to increase awareness of the TaRDIS vision, objectives, and achievements and a stakeholders engagement strategy for an open, participatory, and sustainable community. The document describes the strategic approach, sets the overall framework, and provides directions regarding all planned communication and engagement activities and will be regularly updated to match the evolving needs and opportunities.
Keywords	Dissemination, communication, events, impact creation

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V0.1	20/02/2023	1st version of the template for comments	Margherita Facca (*Martel Innovate*)
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Project funded by the European Commission in the Horizon Europe Programme		
Nature of the deliverable:	**R**	
Dissemination Level		
PU	*Public, fully open, e.g. web (Deliverables flagged as public will be automatically published in CORDIS project's page)*	✓
SEN	*Sensitive, limited under the conditions of the Grant Agreement*	
Classified R-UE/ EU-R	*EU RESTRICTED under the Commission Decision No2015/ 444*	
Classified C-UE/ EU-C	*EU CONFIDENTIAL under the Commission Decision No2015/ 444*	
Classified S-UE/ EU-S	*EU SECRET under the Commission Decision No2015/ 444*	

* R: Document, report (excluding the periodic and final reports)

DEM: Demonstrator, pilot, prototype, plan designs

DEC: Websites, patents filing, press & media actions, videos, etc.

DATA: Data sets, microdata, etc.

DMP: Data management plan

ETHICS: Deliverables related to ethics issues.

SECURITY: Deliverables related to security issues

OTHER: Software, technical diagram, algorithms, models, etc.

EXECUTIVE SUMMARY

The document at hand presents a comprehensive communication, dissemination, and community-building strategy that has been developed to maximise the impact of TaRDIS and ensure that the following communication-related project objectives are met:

- Establishing a distinctive and recognizable brand identity that will support promotional and marketing efforts.
- Achieving broad visibility and raising awareness about TaRDIS and its results.
- Support other tasks and WPs in attracting new stakeholders to the TaRDIS ecosystem by creating meaningful communications.
- Produce appealing promotional artefacts, and provide support in event organisation.
- Establishing liaisons with relevant initiatives.

In addition to setting the communication framework, the strategy provides clear directions for the consortium and can be viewed as a guiding document for project partners, so that they can better align on the communication objectives and planned dissemination activities.

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ABBREVIATIONS

IP	Internet Protocol
TCP	Transmission Control Protocol
5GPPP	5G Public Private Partnership
EU	European Union
EC	European Commission
CNCF	Cloud Native Computing Foundation
SDO	Standards Development Organization
IRTF	Internet Research Task Force
SEO	Search Engine Optimization
GDPR	General Data Protection Regulation
HPC	High Performance Computing
WP	Work Package
KPI	Key Performance Indicators
M	Month
ADRA	AI, Data and Robotics Association
BDVA	Big Data Value Association
AIOTI	Alliance for the Internet of Things Innovation

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1 INTRODUCTION

1.1 THE TARDIS VISION

Developing and managing distributed systems is a highly complex task requiring expertise across different domains, from programming languages to hardware, networking, operating systems, and distributed protocols. This complexity becomes more pronounced when considering swarm systems which are highly dynamic and require decentralised (or partially decentralised) solutions to cope with the scale and heterogeneity of execution environments. Properly configuring a swarm of low orbit satellites, coordinating a network of devices in a smart city, taking advantage of data generated at the edge to perform privacy-aware federated learning, or planning and evolving a factory shop floor with autonomous machines share construction and coordination challenges that are far from reach of the average software engineer. Developing correct, reliable, and secure systems in such contexts requires developers to reason about aspects across multiple layers of the system and across heterogeneous devices and communication mediums including, considering errors or anomalies across communication channels, hardware, operating systems, or other software components, as well as changes in the system membership.

TaRDIS addresses the ever-increasing complexities of developing correct and performant **heterogeneous swarms**

- swarm systems that are heterogeneous, intelligent, dynamic, and decentralised
- by providing a novel programming model, integrated development and analysis environment, and corresponding runtime support.

TaRDIS proposes a language-independent event-driven programming model that allows developers to specify the behaviour of different components in their distributed system as a collection of autonomous collaborative nodes. This programming model exposes, through an event-based interface, simple and effective distribution abstractions and access to powerful decentralised machine learning algorithms and models, that programmers leverage to develop their applications.

1.2 MOVING AHEAD

In order to achieve the goal of creating intelligent, dynamic, decentralised and heterogeneous swarm system, TaRDIS has defined a set of objectives, which are:

- To develop a language-independent, event-driven programming model that offers distribution abstractions and decentralised machine learning primitives.
- To build a development environment for correct-by-design heterogeneous swarms with embedded semantic analyses to achieve a correctness-by-design approach.
- To develop schemes to support decentralised intelligence for the purpose of heterogeneous swarms.
- Development of decentralised algorithms and protocols for supporting the TaRDIS programming model at runtime.
- To ensure a high level of interoperability of TaRDIS distribution runtime, a significant number of different devices and programming languages are supported.

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1.3 DOCUMENT LAYOUT

The main purpose of the Dissemination and Communication Strategy and Plan is the creation of a reliable document and a solid plan for efficient knowledge dissemination among the target groups. This deliverable defines the communication and dissemination plan with clear guidelines for the activities undertaken within the objectives of this Work Package. The main goal of this plan is defined throughout the objectives of the TaRDIS communications and dissemination activities. Crucial target groups and bodies that are interested in the project and appropriate key messages are identified in this deliverable. The strategy also includes all communication and dissemination methods, tools and channels for each identified target group. The dissemination time plan presents the overview of all planned activities and their realisation. The monitoring of the dissemination activities provides evaluation of the progress and ensures that the set-out objectives will be realised. This deliverable is intended for internal and public usage. The partners will benefit from a common and shared communication plan to guide the on-going work, while it represents the plan of activities to be submitted to the European Commission for review and made public on the TaRDIS' website.

In order to have an impactful communication and dissemination plan and expand TaRDIS' outreach, there are a set of objectives identified under this work package. The activities undertaken endorse those objectives, which are:

- Ensure visibility of the project and raise awareness towards its results;
- Reach, stimulate and engage stakeholders;
- Facilitate large scale adoption of developed concepts, technologies and tools;
- Foster impactful contribution to relevant scientific domains and standardisation bodies;
- Establish liaisons and ensure close collaboration with relevant initiatives;
- Organise and promote special training and demonstration events.

In the following sections, the plan of activities has been detailed which will steer the project towards achieving its communication and dissemination objectives.

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2 TARDIS COMMUNICATION AND DISSEMINATION STRATEGY

Communication, dissemination and exploitation activities are essential to ensure the success of TaRDIS and are closely coordinated among all the work packages to ensure a cohesive plan of action that will create large scale impact in the European heterogeneous/swarm computing ecosystem and in a global perspective. In order to widen the outreach of the project's efforts and maximise the impact TaRDIS activities will have, the consortium pursues and ensures close coordination with the European Commission, other ongoing swarm computing projects and other relevant initiatives in closely linked domains, such as the EUCloudEdgeIoT, ADRA, BDVA, AIOTI, HPC and GAIA-X.

In this respect, TaRDIS gradually and systematically builds up and mobilises a community with major players on the distributed and decentralised computing scene including innovators, researchers, big, medium and small businesses, committed to adopting and exploiting the project's outcomes in a sustainable way by embracing nationally and internationally related efforts. The main idea is to involve a critical mass of relevant stakeholders early in the project by properly tuning promotional and marketing activities and by keeping them engaged through a continuous and dynamic approach.

For this purpose, TaRDIS puts in place a comprehensive set of measures, which are aimed at maximising the envisaged impact in a coordinated way: by tightly integrating the communication and dissemination activities with exploitation and sustainability work.

A set of dedicated outreach and communication activities will ensure that the below project objectives are met.

- Establish a distinctive and easily recognizable identity that will support promotional and marketing efforts;
- Raise awareness about TaRDIS results and benefits and ensure the project's broad visibility and uptake among the European swarm computing communities;
- Reach, stimulate, and engage a critical mass of relevant stakeholders to ensure that the project results are effectively showcased, leading to validation, improvement, and possible further adoption of the developed technologies and concepts;
- Facilitate sustainability and exploitation of the project's outcomes and promote the development of innovative solutions based on the TaRDIS technologies and concepts;
- Support the key players' engagement strategies and activities, while providing visibility and echo to the swarm computing community within the European ecosystem and beyond;
- Foster impactful contributions to relevant scientific domains, open source and standardisation bodies as appropriate;
- Create and grow the community around the project and foster interactions with other initiatives and EU-funded projects on similar topics facilitating discussion, scaling up, and experience sharing;
- Design and implement a framework for the monitoring and assessment of the impact created by TaRDIS.

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2.1 COMMUNICATION AND DISSEMINATION PHASES

TaRDIS' communication and dissemination strategy and plan includes offline and online communication, digital presence, participation in and organisation of events, interaction with other research and innovation projects within the domain, as well as liaisons with relevant stakeholders and related EU research and innovation initiatives. The core structure of the envisaged plan has been broken down into three stages.

Outset (M1-M12): Awareness creation and communication foundation

Scope: The development of dissemination, communication, and community building strategy and plan, including the refinement and mapping of target groups, selection of dedicated communication tools and community building activities, and informing all relevant stakeholders about the TaRDIS scope and objectives. This phase is also dedicated to defining the liaisons and interaction mechanisms with targeted projects, relevant communities like EUCloudEdgeIoT, ADRA, BDVA, AIOTI, HPC and GAIA-X and standardisation bodies like 3GPP, ETSI, IRTF and 5GPPP.

Measures: bespoke brand identity and project website, communication and dissemination strategy and plan, event calendar, project introduction flyer, project presentation (slides), project social media channels, and introducing the project in some communities, eg EUCloudEdgeIoT communication task force, organisation of first technical workshop by the end of year 1 to showcase interim results and liaise with projects from the same cluster for synergies and wider outreach.

Formation (M13-M24): Dissemination and stakeholder engagement

Scope: Run stakeholders' engagement campaigns to generate interest in TaRDIS activities and outcomes and set a solid foundation for the planned dissemination activities and encourage them to provide support in promoting the project. Plan event participation and organisation including the project workshops.

Measures: slide-based presentations of first project results, first project video, regular animation of social media channels, publishing news items, sending out periodical newsletters, and participation in selected events, organisation of 2nd technical workshop and engaging in clustering activities for dissemination.

Boosting engagement (M25-M36): Global outreach and sustainable impact

Scope: Engaging and supporting the adoption and deployment of the concepts and tools offered by TaRDIS through dedicated promotional activities ensuring the project's uptake and strong and durable impact for commercial purposes and policymaking.

Measures: Promotional materials in various forms, online publications, established liaisons with relevant initiatives, news items, press releases, technical reports, additional editions of the e-newsletter, interviews, videoclips, dedicated webinars, training materials, participation in events, infographics presenting project results, organisation of final technical workshops, demos in events.

2.2 REACHING A BROAD AUDIENCE

The diverse target groups TaRDIS plans to address, which have a very different level of knowledge and expectations with respect to data-centric research, require the definition and use of tailored mechanisms and tools able to properly convey the right message for each

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audience. The list of target stakeholders identified at the time of proposal preparation includes:

- **Technology provider companies, industry players including those from the use-case sector:** Cloud platform providers, software and applications developing companies, SMEs and startups including those working in the development of heterogeneous systems.
- **Public sector and civil society:** Public organisations and civil society organisations.
- **Scientific community in the field of cloud-edge continuum, IoT, AI and machine learning:** scientists and researchers at research institutions and universities.
- **Open-source communities and standardisation bodies:** Open-source communities, such as CNFC, the Linux Foundation, and Apache (Arrow, Parquet, Ranger, Atlas, Egeria). Standards Developing Organizations (SDOs), such as ETSI, 5GPP, IRTF etc.
- **General public:** Private individuals interested in swarms, decentralised computing, cloud edge technologies.

For each of these groups, customised communication and dissemination activities will be pursued as part of the communication and dissemination strategy and plan, in order to deliver a consistent message to all target audiences, while ensuring to properly translate the TaRDIS value proposition in a way that can more effectively contribute to engage the different players.

2.3 PRIMARY COMMUNICATION AND DISSEMINATION CHANNELS

A broad array of communication and dissemination channels is used to effectively reach the target groups and to maximise awareness of the overall project's work and outcome. The synergy of TaRDIS dissemination is generated through seamless connected online and offline communication activities. Both online (e.g., website and social media) and offline channels (e.g. events) will be used to disseminate TaRDIS related activities and project actions throughout Europe and beyond. In addition, all the networks and multipliers channels allow the partners of TaRDIS to raise the visibility of the project's achievements and to reach a critical mass of stakeholders, developers, contributors, integrators, researchers and relevant key players for an efficient implementation of the project work plan.

The dissemination channels used to reach each target group are detailed in Table 1:

Table 1: Communication & Dissemination Channels per target group

Channel/target group	Technology professionals in business	Public organisations	Innovators & researchers	Open source & standardisation bodies	Policy makers	Civil society	General public
Website	X	X	X	X	X	X	X
Social media	X	X	X	X	X	X	X
Newsletter	X	X	X		X	X	X
Conferences	X	X	X	X			

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Own events	X	X	X	X	X	X	
External events	X	X	X	X	X		
Scientific publications		X	X		X		
Marketing materials (eg, flyers)	X	X	X		X	X	

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3 KICK-OFF OF THE DISSEMINATION ACTIVITIES

3.1 PROJECT'S BRAND IDENTITY

Brand identity consists of visible assets, such as logo, colour palette, and typography that are created to portray a certain image and distinguish the brand. It defines how those who come in contact with the brand perceive it and influences their opinion about it. Good brand identity provides unique and memorable assets and a unified and consistent 'look and feel' across all outlets (electronic and printed visual media).

Figure 1: Creating TaRDIS brand identity

The design of the TaRDIS brand identity began during the proposal preparation. The following assets have been developed as part of the TaRDIS brand:

- Colour palette
- Logo and icon with different variations
- Typography
- Templates for deliverables and presentations

Figure 2: TaRDIS Logo

3.1.1 TaRDIS' Colour Palette

There is no doubt that first impressions count. The main reason why they are so important is that they last well beyond the first time we come in contact with something new. This is due to the primacy effect, which is the tendency to remember the first things in a sequence best. Having this in mind, the creative team leveraged the findings of colour psychology and colour

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theory and started with a foundational element of any brand identity – colour, as this is usually the first thing stakeholders see. To determine the palette that works best for TaRDIS, the team looked at the associations of colours to clearly convey TaRDIS brand personality and showcase optimism, creativity, and the project's commitment to trustworthiness. When choosing the colours, it was also important that they worked together in harmony, which is why the team opted for an analogous brand colour palette. A main palette of 4 colours based on the logo colour scheme. These are the colours of the logo gradient and elements. In combination with the main colours palette, two more greyscale colours can be used.

For slide presentations and deliverables: the colour of standard elements has been defined and locked in the respective templates, as those documents are likely to be mainly edited outside design departments.

Figure 3: TaRDIS Colour Palette

3.1.2 Logo

The main idea behind the logo (Figure 2) was to synthesise a continuous model connecting the cloud, fog, edge paradigms. It reflects as the main idea behind the TaRDIS toolkit, a programming model for swarm systems that are heterogeneous, intelligent, dynamic and decentralised across the computing continuum. A textual part with the name of the project has been added to support the ideogram.

3.1.3 Typography

TaRDIS' brand uses the open-source fonts from Google Fonts: Comfortaa (Bold version) for headings and Roboto (Regular and Bold versions) for body copy and headings too. The usage of other versions of the fonts are allowed. This applies to the website, presentations and all promotional material.

For deliverables, the system font Arial (only Regular and Bold versions) will be used instead, to avoid missing font issues, as those documents are likely to be mainly edited outside design departments. It could be used also for presentations in case the two brand fonts are missing.

3.1.4 Templates

To ensure that all deliverables produced within the scope of the project follow the same structure, a Word document template has been created. The template will be used by all partners to guarantee visual consistency of the layout, format, and boilerplate text across all deliverables. The document at hand also follows the defined template.

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A PowerPoint presentation template has been created to be used by all partners when preparing their presentations for external events, meetings, etc.

In addition, a press release template has been created as well to be used by all partners when preparing a press release for important activities and news.

3.1.5 Brand Guidelines

Brand guidelines are a book of rules as to how the brand should appear, which is important for consistency. Building and maintaining a strong brand identity helps to be recognizable and remembered. TaRDIS brand guidelines consist of the following components:

- the logo variations with the 'dos and don'ts',
- colour palette (PMS, CMYK, RGB, and HEX),
- typography/font for use in emails, print, and websites.
- EU acknowledgement and recognition for scientific publications and promo materials.

The detailed brand guidelines can be found in Appendix A.

3.2 ONLINE COMMUNICATION

3.2.1 Website

Launched in the 3rd week of March 2023, the TaRDIS website has been developed to act as an information hub presenting the project's goals, objectives, activities, the pilots, achievements, news and events. The website has a landing pillar page that highlights the main traits of the projects, this pillar page concept is more attractive for the website as it gives the visitor the main attributes of the project without having to leave the home page, as well as it ranks high on SEO. On top of the home page are also menu items which showcase the activities, outputs, features of the project. The wireframe of the website had been shared with the consortium during the project Kickoff meeting in order to gather feedback for content. Many of the pages in the website have already been published and some will be published at a later stage, when respective content/output is available and/or published.

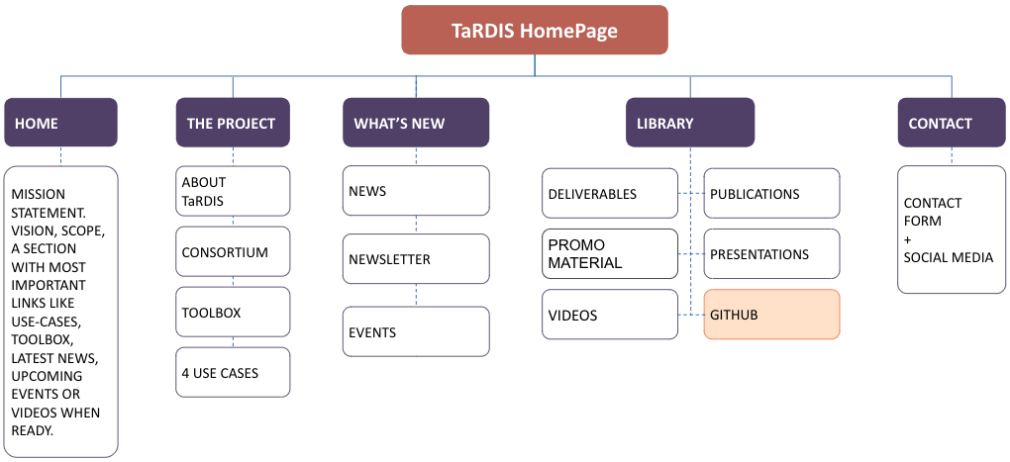

Figure 4: TaRDIS website: wireframe

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Figure 5: TaRDIS Website: responsive views

The website consists of the following menu items:

Home: The landing page is published and consists of components which also links to dedicated webpages in the website, eg. Toolbox, Pilots give a snapshot of these features, and a button is added that directs the user to a more detailed description on a dedicated webpage.

The project: This menu item has components that give information about the project, the consortium, the software which the project will be producing and the pilots. It is also decided to create a page featuring TaRDIS' advisory board members as these experts' profiles when added will bring good traffic to the website. However, the project is in the process of contacting and onboarding members on the Advisory Board and if only there is full consent from all, this page will be published.

What's new: Under this menu item, is information about the news from the project and the relevant and upcoming events for the project.

Library: This menu item consists of the different outputs of the project, eg, public deliverables, presentations, promo materials and the software. It has been decided that the "Software" sub-menu will be just an item on the menu which will redirect the user to the public "Github" repository of the project. The consortium is in the process of discussion about the public software repository and once this is set up, it will be linked via the website.

Contact form: This page allows the user to get in touch with the project representatives.

At the time of writing of this deliverable, the website counted 2486 visitors that generated 319 pageviews and that had an average visit duration of 43 seconds, as shown in Figure 6.

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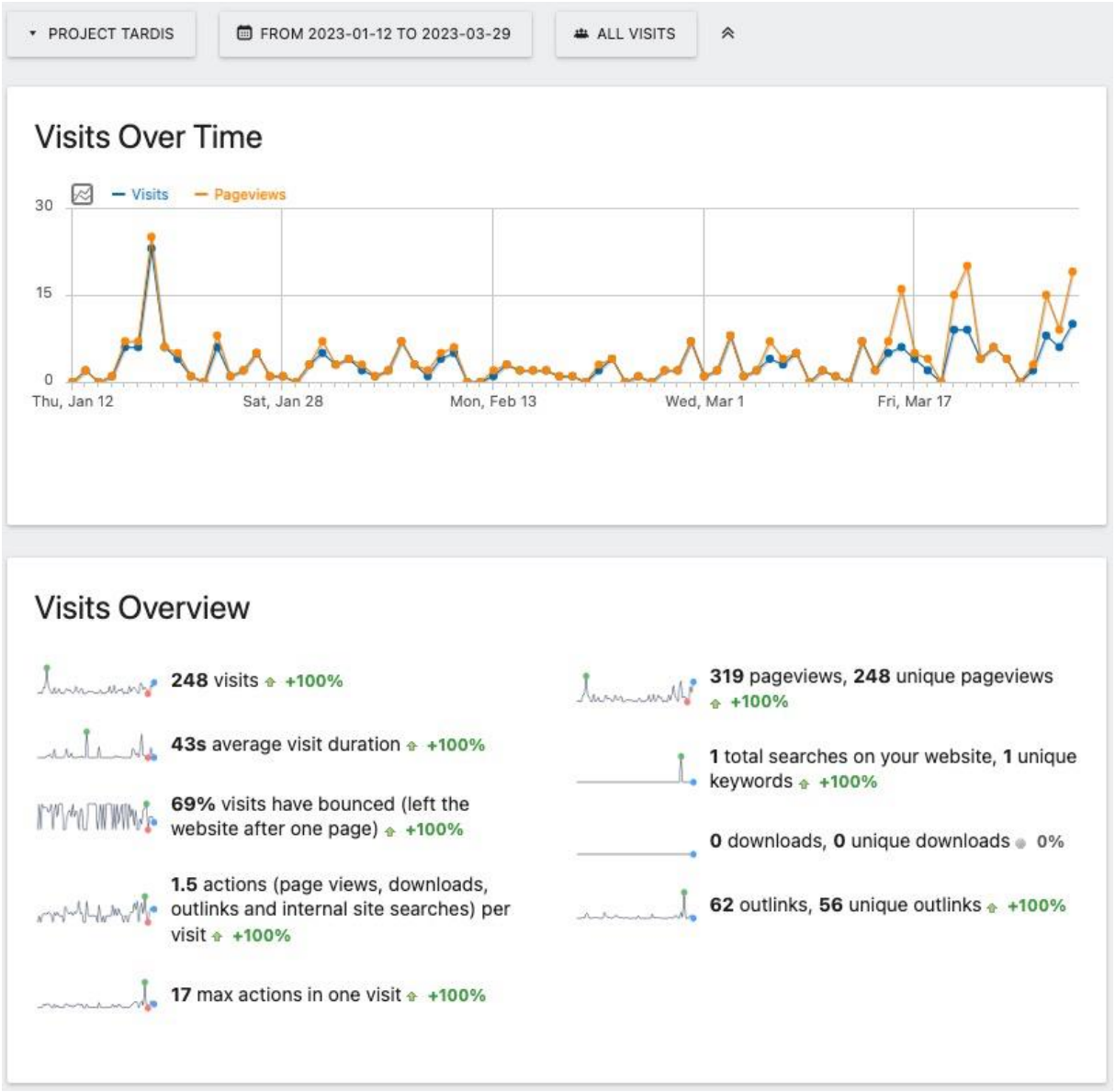

Figure 6: TaRDIS website: analytics

As one of the main dissemination channels and dynamic tools, the website will undergo major streamlining, and it will be continuously updated throughout the lifetime of the project. Since its inception, Martel is working on supporting the traffic to the website through:

- **SEO** – the website traffic will increase progressively throughout the project thanks to the implementation of techniques oriented at driving organic traffic, such as the use of appropriate keywords and the production of engaging and shareable content.
- **Link building** – synergies between the project's website and the partners' websites, as well as with other relevant agents of the sector (targeted stakeholders) will be created, encouraging the exchange of links.

It should be noted that all the information and emails collected are protected under the General Data Protection Regulation (GDPR). TaRDIS will only contact those who have submitted their inquiries and send newsletters only to those who have explicitly requested to receive them. Any person who has subscribed will be allowed to remove their email address

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from the list upon request. Additionally, the website provides information on the stored data and how they are used in alignment with the GDPR under the Privacy policy link (footer of the webpage).

Last but not least, TaRDIS opted for an environmentally responsible website hosting platform, which has been designed to be as energy efficient as possible to limit the unnecessary waste of resources. The web hosting provider, GreenGeeks, puts back three times the power consumed into the grid in the form of renewable energy.

3.2.2 Newsletter

The consortium has scheduled 2 TaRDIS newsletters per year providing updates on project activities and results. More specifically, the newsletters will contain information on the upcoming tasks, attended and organised events, as well as any relevant news and announcements from individual partners. All consortium members will provide relevant information to ensure that the content of the newsletter is engaging, accurate, and timely.

In case of an important information/announcement to be made, a newsflash will be sent to the newsletter subscribers. The difference between a newsletter and a newsflash is in the number of announcements made. A newsletter is a longer compilation of news and events, activities and outputs of the project whereas a newsflash is information about just 1 activity/output. A newsflash enables giving more attention to a news piece as compared to that being part of a longer newsletter.

The design of each newsletter will be aligned with TaRDIS brand identity and will be fully responsive to ensure its full readability on any device. The technology behind the newsletter will provide enough flexibility to be adapted to the communication needs of the project. All issued newsletters will be uploaded on the website.

A mailing list based on subscription has been created, giving the possibility to share the newsletter via mass mailing. A registration functionality allowing interested visitors to subscribe to the newsletter is already available on the project website. Martel will ensure that the above mentioned actions comply with the requirements of the GDPR. Mailings with invitations to relevant workshops and webinars, consultations, and any other information that cannot wait for the newsletter publication will be sent to the same database used for the newsletter.

The first newsletter of the project will be published in the second quarter of 2023 giving general information about the project, the pilots, highlighting the consortium and reports from events participation. If there are some technical updates, an editorial article on the technical update will be included.

3.2.3 Social Media

Various social networks have been established as marketing tools and linked to the project website. Their goal is to promote the activities and outputs of the project and build a network around the project's work while encouraging a discussion on swarm computing centric technologies and platforms, and other related topics. Below is an overview of the social media channels created for TaRDIS.

Twitter

Twitter is a dynamic social network that covers the news in real-time at a global level. TaRDIS Twitter account, @TARDIS_eu (https://twitter.com/TARDIS_eu), was established in

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December 2022, before the official start of the project. At the time of writing, it counts **55** followers.

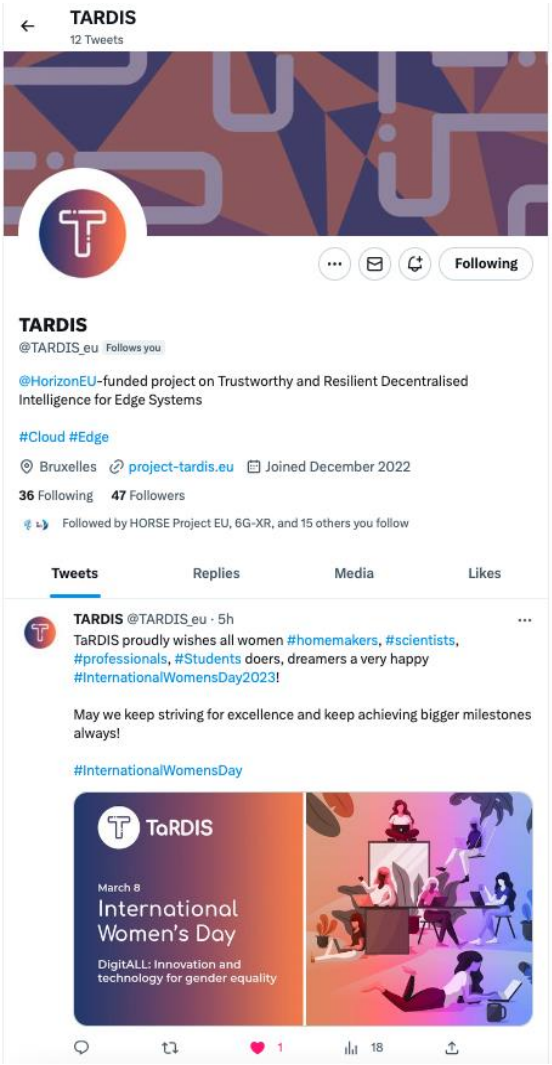

Figure 7: TaRDIS twitter home page

The Twitter account is used to promote the project, as well as to share relevant news and events and project related partners updates. TaRDIS uses Twitter to establish meaningful connections with an active and relevant audience, such as academics, policymakers, and the general public. By following relevant users throughout the duration of the project, TaRDIS will not only gain access to relevant content and updates but also acquire more followers. Examples of appropriate hashtags: #swarmcomputing, #decentralisedcomputing, #cloud, #edge, #HPC, #H2020.

To maximise the visibility of the project on social media channels, TaRDIS follows the accounts of relevant initiatives and projects and retweets their updates when appropriate. Below is the list of Twitter accounts of some of the relevant initiatives:

- @EU_Commission
- @HCLOUD_Project
- @CnectCloud
- @NetTechEU
- @EU_CloudEdgeIoT
- @DigitalEU
- @BDVA_eu
- @EU_opendata
- @ESA

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To create a large ripple effect, TaRDIS maintains a list of social media accounts of the partners and tags the partners wherever it is relevant for any partner.

Table 2: TaRDIS partners social media accounts

Partner name	LinkedIn page	Twitter handle
Martel Innovate	https://www.linkedin.com/company/martel-gmbh/	@Martel_Innovate
DTU Compute	https://www.linkedin.com/company/dtu-mathematics	@DTU_Compute
Caixa Mágica Software	https://www.linkedin.com/company/caixa-magica-software	@LinuxCM
EDP Centre for New Energy Technologies	https://www.linkedin.com/company/edp	@innovationatEDP
Actyx AG	https://www.linkedin.com/company/actyx/	@actyx
University of Novi Sad, Faculty of Technical Sciences	https://www.linkedin.com/school/faculty-of-technical-sciences-university-of-novi-sad/	@FTN_NS
The Chancellor, Masters and Scholars of the University of Oxford	https://www.linkedin.com/school/oxforduni/	@UniofOxford
Telefonica Investigacion Y Desarollo SA	https://www.linkedin.com/company/telefonica/	@Telefonica
GMV Aerospace and Defence	https://www.linkedin.com/company/gmv/	@infoGMV
National Kapodistrain University of Athens	https://www.linkedin.com/school/national-kapodistrian/	@of_nkua
NOVA University	https://www.linkedin.com/school/universidade-nova-de-lisboa/	@NOVAunl

LinkedIn

LinkedIn is currently the main business network in the world with more than 150 million users. TaRDIS has established its LinkedIn page (https://www.linkedin.com/company/tardis-project/) in December 2022, before the official kickoff of the project. At the time of writing, the account has 69 followers. The profile supplements the website by helping to drive traffic to the site and offers a way to promote the project to a broader audience. Partners' LinkedIn pages, as mentioned in Table 2, are mentioned when appropriate to create positive visibility exchanges. Besides, Martel intends to promote TaRDIS across relevant LinkedIn groups to grow the project's audience.

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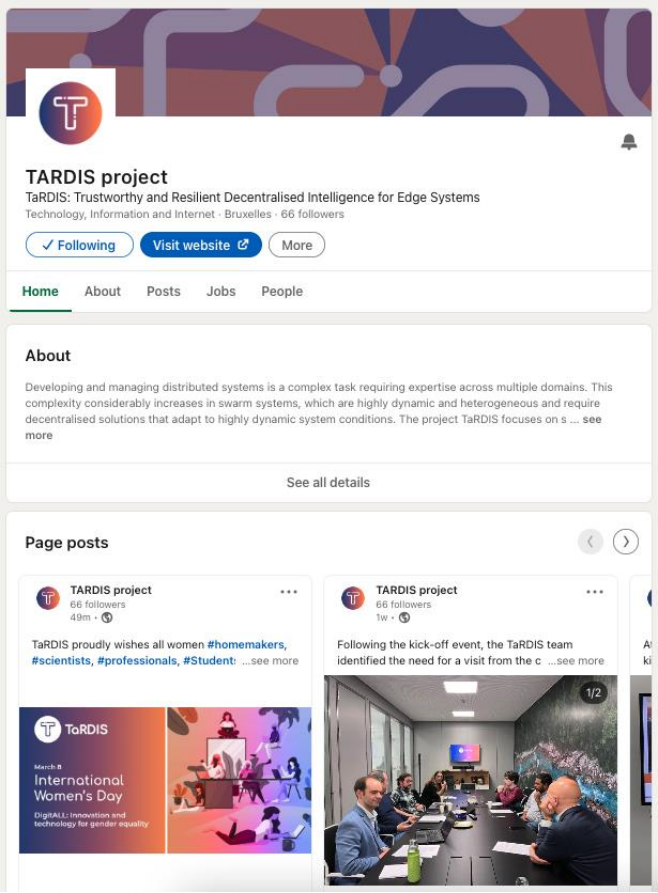

Figure 8: TaRDIS LinkedIn page

3.3 VIDEOS

TaRDIS plans to open its YouTube channel to publish its first video as soon as it has been created, tentatively in the second quarter of 2023. The idea of this video will be to introduce the project in the community. This video will be used for further publicity of TaRDIS via multiple channels, apart from TaRDIS' own social media.

Apart from the partners interviews, events participation, and marketing related videos, TaRDIS plans to publish videos to provide updates on the project, disseminate its vision and achievements, and promote the experts and other stakeholders involved. Producing and sharing such content will support awareness creation, stakeholder engagement, and the uptake of project results and the developed technology.

3.4 PROMOTIONAL MATERIALS

During the lifetime of the project, a number of documents, deliverables, technical reports, posters, webinars, and presentations will be produced. All outputs of the project can and will be used for the promotion of the project. Promotion in terms of raising awareness about the project in the scientific as well as industrial community and promotion in terms of exploitation of the technological products of the project.

Some promotional materials that will be produced during the course of the project are:

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- A leaflet, updated at least once, to reflect the project's evolution.
- A roll-up as and when TaRDIS will participate/organise a session at an event.
- Different promotional materials will be designed and printed as per the requirement and the kind of event, e.g., bookmarks, booth giveaways (if/when TaRDIS participates as an exhibitor in an expo kind of event).

Figure 9: TaRDIS rollup

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4 PLAN OF ACTIVITIES M1-M36

4.1 WORKSHOPS & CONFERENCES

The organisation of events in the form of webinars, sessions, workshops, and demos will play a crucial role throughout the duration of the project. The consortium plans to organise three workshops. The first one is planned for M18, while the other two are planned for M24 and M36. There will be an emphasis on organising face-to-face events but also depending on the feasibility of the conditions, it will be decided whether to organise a remote event or a physical one.

Dedicated and active participation in conferences and workshops co-located with major events to engage with relevant data centric initiatives and other EC funded projects will be an emphasis. TaRDIS has joined the communication task force of the EUCloudEdgeIoT initiative and is proactively initiating discussions for collaborative activities particularly for communication and dissemination. TaRDIS is also exploring clustering activities for dissemination with projects funded in the same call, e.g. INCODE (https://www.incode-project.eu/).

TaRDIS maintains an internal events overview sheet where upcoming important events are catalogued. All partners periodically maintain that list when they have or are going to attend an event/conference.

4.2 JOURNALS, CONFERENCES AND EXTERNAL EVENTS

Table 3 presents relevant conferences where the consortium intends to promote TaRDIS. At the moment, the list includes the events organised within the first year of the project. Project partners will be regularly expanding this list to include conferences beyond 2023. More details on the attended events will be provided in **D8.3** Outreach activities mid-term report at **M18** and **D8.5** Outreach activities final report at **M36**.

Table 3: Targeted external events

Name of the event	Date, Location	Link to website	Type of audience
Computers, Privacy and Data Protection conference (CPDP)	24-26 May 2023, Brussels	https://www.cpdpconferences.org/	Academics, lawyers, practitioners, policy-makers, industry and civil society
European Conference on Service-Oriented and Cloud Computing (ESoCC)	2023 dates unavailable	2023 website unavailable	Academia and industry
European Symposium on Research in Computer Security (ESORICS)	25-29 Sept 2023, The Hague	https://www.esorics2023.org/	Academia and industry
17th USENIX Symposium on	10-12 July 2023, Boston	https://www.usenix.org/conference/osdi	Data management and database researchers,

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Operating Systems Design and Implementation		23	vendors, practitioners, application developers, and users
EuroSys 2023	8-13 May 2023, Rome	https://2023.eurosys.org/	Researchers, practitioners, developers, and users
IEEE International Conference on Distributed Computing Systems (ICDCS)	18-21 July 2023, Hong Kong	https://www.icdcs.org/	Academia and industry
IEEE European Symposium on Security and Privacy (EuroS&P)	3-7 July 2023, Delft	https://eurosp2023.ieee-security.org/#:~:text=Following%20this%20story%20of%20success,is%20organized%20by%20TU%20Delft	Academia and industry
IEEE International Conference on Blockchain and Cryptocurrency (ICBC)	1-5 May 2023, Dubai	https://icbc2023.ieee-icbc.org/	Academia and industry
IEEE International Conference on Cloud Computing (Cloud)	2-8 July 2023, Illinois	https://conferences.computer.org/cloud/2023/	Researchers and industry practitioners
Global Public Transport Summit	4-7 June 2023, Barcelona	https://uitpsummit.org/	All transport modes, industry authorities and operators, exhibitors
International Conference on Advanced Information Systems Engineering (CAiSE)	12-16 June 2023, Zaragoza	https://caise23.svit.usj.es/	Researchers and industry practitioners
IEEE/ACM International Conference on Utility and Cloud Computing (UCC)	2023 dates unavailable	2023 website unavailable	Academia and industry
The European Big Data Value Forum (EBDVF)	2023 dates unavailable	2023 website unavailable	Industry, academia, policy makers
Data Week BDVA	12-15 June, Luleå	https://www.bdva.eu/data-week-2023	Industry, academia, policy makers
IEEE Symposium on Security and Privacy (S&P)	22-25 May 2023, San Francisco	https://www.ieee-security.org/TC/SP2023/	Academia and industry

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4.3 SYNERGIES WITH RELATED PROJECTS AND INITIATIVES

TaRDIS partners are or were recently involved in European and national projects that provide relevant foundational outputs that will feed into TaRDIS. The individual partners' profiles include further related projects.

H2020 MARVEL (https://www.marvel-project.eu), where UNS is a partner, aims to develop solutions for personalised Federated Learning (FL), optimal FL protocols for heterogeneous clients, and optimal edge-fog-cloud deployments of AI tasks. TaRDIS will leverage these solutions to create novel federated and swarm learning techniques, and system optimisation and orchestration methods.

H2020 AFFORDABLE5G (http://www.affordable5g.eu/), where NKUA and MTL are partners, has developed distributed Deep Reinforcement Learning (DRL) and Deep Neural Network methods (DNN) to optimise the network utilisation, including radio resource management at the edge of the 5G network while enhancing the energy efficiency of the system. TaRDIS will extend these decentralised DRL and DNN methods for the accurate regulation of the operational parameters of the swarm devices.

H2020 I-BiDaaS (https://ibidaas.eu), where UNS and TID are partners, aims to develop industrial-driven big data as a self-service solution through distributed ML in data centres and cloud environments. TaRDIS will extend the methodologies for distributed ML to heterogeneous swarms.

H2020 EFPF (https://www.efpf.org), where CMS is a partner, is a federated smart factory ecosystem and a digital platform that interlinks different stakeholders of the digital manufacturing domain. TaRDIS will leverage the integration techniques to merge multiple technologies and services into a single platform.

H2020 LightKone (http://www.lightkone.eu/), where NOVA is a partner, developed technologies to support general- purpose data sharing and computation at the edge. TaRDIS will extend those results towards fully decentralised and dynamic solutions.

H2020 vf-OS (https://www.vf-os.eu), where CMS participated, proposed an open application development kit that supports software developers in deploying manufacturing smart applications. TaRDIS will reuse the container- targeted development environment based on state-of-the-art technology.

H2020 CyberSec4Europe (https://cybersec4europe.eu), where DTU participates, aims to develop novel solutions and products to consolidate the cybersecurity capabilities needed to maintain European democracy and the integrity of the Digital Single Market. DTU can help build bridges between researchers and industrial communities on applications' security and disseminate TaRDIS solutions.

H2020 BehAPI (http://www.um.edu.mt/projects/behapi/), where NOVA, DTU, ACT, and CMS participate, aims to bring existing prototype tools based on behavioural types to mainstream programming languages. TaRDIS will leverage those results towards the heterogeneity, dynamicity, and scale of swarm systems.

CMU-Portugal GOLEM, where NOVA is a partner, develops automated programming techniques for low-code platforms based on program synthesis that prevent programming errors. TaRDIS will leverage the synthesis and verification techniques for extracting abstract models from the developer's code.

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UK-EPSRC POST, where UOX is the coordinator, seeks to unify session type theories to increase the range of communications behaviours and protocols that can be statically verified. TaRDIS will extend and refine extension session types to enable reasoning about communicated values at the level of types.

UK-EPSRC STARDUST, where UOX and ACT are partners, seeks to improve the reliability of distributed systems using session type theories, focusing on supporting systems that can fail at all levels of the system stack. The support of failure models is highly relevant for edge computing and will be integrated into TaRDIS.

Danish Industry Fund Sb3D, where DTU participates, develops methodologies and tools to address security concerns in the development and life cycle of software products. TaRDIS will leverage the cross-pollination of use cases and novel approaches to application security.

Serbia-MESTD EmbSys, led by UNS, addresses the development of embedded systems with connected services and digital technology. EmbSys results can be leveraged to develop infrastructure of secured distributed systems based on the use of network communication protocols.

In addition to the above projects, TaRDIS also will be collaborating closely with **INCODE** (https://www.incode-project.eu/) which is funded under the same call as TaRDIS (HORIZON-CL4-2022-DATA-01), MARTEL, which leads the Dissemination, Exploitation and Standardization Work package of TaRDIS is also leading that for INCODE. Therefore there is a close collaboration between the two in dissemination activities.

TaRDIS has also joined the **EUCloudEdgeIoT** initiative (https://eucloudedgeiot.eu/), which is run conjointly by 2 CSAs; UnlockCEI and OpenContinuum. MARTEL is coordinating OpenContinuum, therefore is strategically responsible for the communication and dissemination activities of the EUCloudEdgeIoT initiative. These strategic positionings will support the TaRDIS project and its results to have a deeper and wider outreach.

4.4 CONTRIBUTION TO OPEN SOURCE INITIATIVES AND STANDARDS

TaRDIS partners have several connections with open source communities that are relevant to the dissemination and impact of the project results. In more detail, the partners have the following connections:

Libp2p (https://libp2p.io/), where ACT, NOVA, and TID, have strong connections with the community and maintainers. Libp2p is an open source peer-to-peer collection of libraries that is available in, as is being expanded to, various programming languages. Libp2p provides several guidelines and services to build highly distributed applications.

ODL (opendaylight.org) is widely used within Telefónica mainly to aggregate control and visibility of several different heterogeneous SDN controllers to provide centralised administration and a global network view. Telefónica also contributes to the development of ODL and TID will explore opportunities to leverage TaRDIS to bring agility to the development.

Linux Caixa Mágica (https://www.caixamagica.pt/en/linux-cm) is an open-source Linux distribution installed on more than 800K computers in Portuguese schools and student laptops, as well in 8K desktops in Mexico. Last year, CMS distributed laptops with hardware limitations with its distribution to third-world countries and tablets for seniors. CMS is very

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active in the open-source communities in Europe, founding and hosting since 2003 the top international open source in Portugal (https://opensourcelisbon.syone.com).

TaRDIS has set out a roadmap for contributing to different standardisation bodies at the beginning of the project within the scope of T8.2 – with a preliminary assessment provided in the table below, to be followed up through periodic activity reporting, identifying opportunities to push contributions into future standards and pre-normative activities meaningful for the scope of the project. Members of the consortium will be appointed to participate in working groups and technical committees to ensure an active representation, reporting on the project advances and raising awareness about potential collaboration efforts. Standardisation contributions will be driven and carried out by individual partners on behalf of the project (possibly co-signed by other partners), through their delegates. This constant and structured activity is expected to achieve concrete results as regards standardisation, as well as engagement with the target stakeholders and acceptance in the reference technical communities.

Table 4: Standardisation bodies

Body	Working Group/ Tech. communities	TaRDIS partners contributions
3GPP	SA, SA2, SA3, SA5	TaRDIS will be formally represented by delegates participating on behalf of its institution, raising awareness of opportunities, and pursuing contributions.
ETSI	NFV, SAI, ZSM	Telefónica (TID) is part of the Technical Steering committees NFV groups and participates as contributors in the groups SAI and ZSM. TID will disseminate to these groups the relevant outcomes from TaRDIS and will also communicate responses and recommendations back to the consortium.
IRTF	COINRG, DINRG	TID is participating as a contributor to these groups and will make aware the corresponding groups of the activities performed by TaRDIS.
5GPPP	Pre-standardization on WG	TID is a full industrial member of the 5GPPP and participates in meetings and other dissemination events. As 5GPPP contributor, TID will expose the rest of the members of this Public Private Partnership to the TaRDIS results and push for recommendations in the execution of easier and verifiable development of decentralised beyond 5G/6G applications.

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5 IMPACT ASSESSMENT

To assess the impact of TaRDIS achievements, a number of indicators will be measured and evaluated in different phases of project implementation with the following objectives:

- Evaluating the degree of end users' satisfaction with the TaRDIS solution and components;
- Updating and assessing the detailed indicators with qualitative and quantitative measures;
- Assessing the impact of the final outcomes of the project.

5.1 QUANTITATIVE INDICATORS

TaRDIS Communication and Dissemination Plan will be closely monitored throughout the duration of the project. The evaluation will be carried out on a regular basis to ensure the success of the project. A set of KPIs has been defined to measure the impact and conduct the most accurate assessment of the communication and dissemination activities. Table 5 presents the KPIs, their relevance to the tools/channels used, and the estimated target value, while Table 6 lists the deliverables within WP8.

Table 5: TaRDIS' communication KPIs

Tool/activity	KPI	Target value
Website	Total visits (yearly)	1500
Social media	Number of followers (by project end) on Twitter Number of followers (by project end) on LinkedIn	1000 in total ≥ 60 posts
Press releases	Number of published press releases (by project end)	≥ 4
Videos	Number of produced videos	≥ 6
Newsletter	Number of newsletters sent out	6
Flyers/brochures Posters/roll-ups	Number of developed flyers/brochures (incl. digital brochures) Number of produced posters/roll-ups	6 ≥ 4
Demos	To diffuse results in the academic community	4
Events (attendance, incl. online)	Number of attended events (yearly)	≥ 9
Events (organisation)	Number of organised events (by project end) Number of participants	≥3 50+

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Scientific publications	Number of publications	≥30

5.2 QUALITATIVE INDICATORS

Additionally, there are other positive results that cannot be easily measured since they cannot be quantified. Thus, in order to better measure the overall impact of the dissemination plan we will use the following qualitative indicators:

- **Proactive online community**. Social network dissemination efforts will ensure an interesting outcome in terms of discussion, feedback and content sharing and engagement.
- **Press/media coverage**. Distribution of press releases and publication of articles are geared to achieve press/media coverage about the project.
- **Long-term influence**. Sometimes the impact takes longer than just an immediate reaction. Therefore, it is expected that the "seed" scattered at the beginning will be "harvested" quite later. This will be considered when monitoring the impact of the project.

5.3 PLANNED DELIVERABLES

Table 6 below lists the planned deliverables for the Dissemination, Exploitation and Standardization work package of TaRDIS.

Table 6: List of planned deliverables for the Communication, Dissemination and Standardisation Work Package

Number	Name	Lead partner	Dissemination level	Due date
D8.1	**Dissemination and Communication Strategy and Plan**	MARTEL	PU	M03
D8.2	**Exploitation and sustainability strategy and plan**	CAIXA MAGICA	SEN	M18
D8.3	**Outreach activities mid-term report**	MARTEL	PU	M18
D8.4	**Outreach activities final report**	MARTEL	PU	M36

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6 CONCLUSIONS AND NEXT STEPS

Deliverable 8.1 Dissemination and Communication Strategy and Plan has been developed to provide guidelines and a consistent framework for all planned project activities to ensure TaRDIS's broad visibility, adequate promotion, and uptake of its results. The document at hand presents the initial communication, dissemination, and community building strategy, describes various activities conducted between M1 and M3, and outlines the planned promotional activities for the coming months. Developing this strategy at the early stages of the project will allow TaRDIS to maximise the impact of communication, dissemination, and stakeholder engagement activities and sustain the concepts, achievements, and knowledge developed throughout the project.

The goal of this plan is to guarantee that:

- All outreach activities follow the guidelines and are executed within the planned schedule,
- The messages are consistent and of a high standard,
- All consortium members contribute to promoting the project.

A monitoring and evaluation framework has been defined to measure the achieved progress and impact of the proposed strategy. Deliverables 8.3 and 8.4 will provide details on the progress of the strategy, achieved KPIs, attended and organised events, and the effectiveness of TaRDIS's online presence at M18 and M36 respectively.

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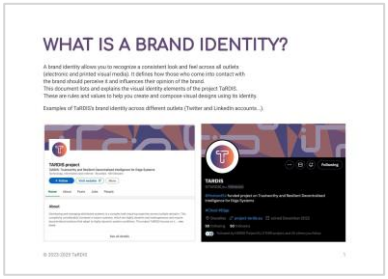
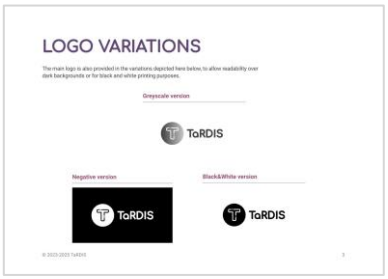
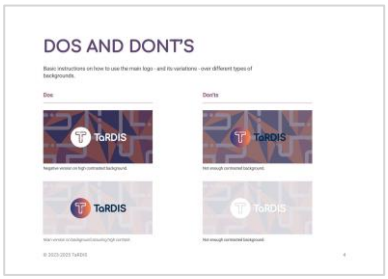
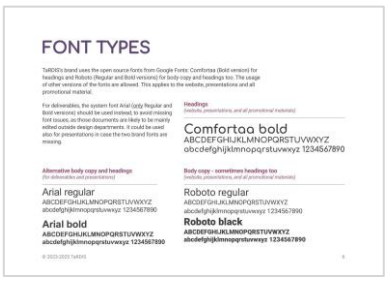
APPENDIX A - TARDIS BRAND GUIDELINES









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