TRUSTEE D6.4 TRUSTEE Outreach, Dissemination, Standardisation and Communication Activities V1

Work package	WP6: Market Shaping, Scale-up Business Models and Socio-Economic Impact & TRUSTEE Outreach and Awareness Generation
Tasks	T6.3: TRUSTEE Dissemination and Communication Plan T6.4: TRUSTEE Awareness Campaigns, Workshops and Clustering Events T6.5: Standardisation and Empowering European Data Spaces
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REVISION AND HISTORY CHART

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0.1	16/03/2023	Albertos Markakis	First draft contents
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1.0	30/06/2023	Albertos Markakis	Final submitted version

EXECUTIVE SUMMARY

This specific deliverable provides an overview on the communication, dissemination and standardisation activities in the TRUSTEE project during the first 12 months. D6.4 "TRUSTEE Outreach, Dissemination, Standardisation and Communication Activities V1", documents the communication, dissemination and standardisation efforts undertaken by the project partners during the initial 12-month period. This deliverable forms part of WP6 "Market Shaping, Scale-up Business Models and Socio-Economic Impact & TRUSTEE Outreach and Awareness Generation".

This Deliverable provides a comprehensive overview of the communication, dissemination and standardisation activities carried out in the first year of the TRUSTEE project, since its kick-off in July 2022. In addition to describing the activities, the report also covers the impact of dissemination efforts on the project objectives and assesses the status of the KPIs established. It also provides an iteration of what was reported in D6.3. The information presented in this deliverable will be iterated, and updated and enhanced where necessary in the next version of this document in M24.

While the primary focus of this deliverable is to report the achievements of the first year's dissemination, standardisation and communication activities, it also offers several insights into the plans for the second year of the project.

Overall, this deliverable serves as an important document, demonstrating the efforts made in the first year of the TRUSTEE project, and laying the groundwork for future efforts.

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GLOSSARY OF TERMS

Consortium - A consortium is a team made up of two or more people, businesses, or governments that collaborate to accomplish a single goal.

Ercim News - The quarterly magazine of the European Research Consortium for Informatics and Mathematics.

Eventbrite - A website that facilitates event planning, registration and ticketing, enabling organisers to create and promote events, sell tickets and manage registrations.

LinkedIn - LinkedIn is the world's largest professional network on the internet, designed specifically for the business community.

Twitter - Twitter is a free social networking site where users upload statuses (short posts), known as tweets, and share others' tweets, known as retweets

YouTube - YouTube is a free platform for uploading videos.

Zenodo - An online repository, social media platform. Zenodo is organised in communities: a collaborative space within the platform where individuals or organization with shared research interests or affiliations are brought together. Communities collect research outputs and publications related to a particular topic, or project.

LIST OF ABBREVIATIONS AND ACRONYMS

ABB: Architecture Building Block

AI: Artificial Intelligence

D&C: Dissemination and Communication

Deutsches Institut für Normung (DIN)

European Data Portal (EDP)

European Data Spaces (EDS)

European Interoperability Framework (EIF)

European Interoperability Reference Architecture (EIRA)

European Open Science Cloud (EOSC)

Explainable artificial intelligence (XAI)

General Data Protection Regulation (GDPR)

Group of Twenty (G20)

Horizon Standardisation Boosters (HSB)

Industry Specification Group on Securing Artificial Intelligence (ISG SAI)

IEEE: Institute of Electrical and Electronics EngineersInternational Organization for Standardisation (ISO)

International Electrotechnical Commission (IEC)

International Data Spaces (IDS)

International Data Spaces Association (IDSA)

KPI: Key Performance Indicator

ML: Machine Learning

National Institute of Standards and Technology (NIST)

Open Group Architecture Framework (TOGAF)

PC: Project Coordinator

TM: Technical Manager

WP: Work Package

1 INTRODUCTION

This deliverable summarizes the progress made during the first year of the project in terms of standardisation, communication, and dissemination activities. As the work is still in its early stages, results are to be current on later stages of the project, and the second and third versions of this deliverable which are due M24 and M42, respectively, will represent its completion.

Firstly, the current version of this deliverable provides the status of the dissemination and communication aspects of the project. Important stages of the Dissemination & Communication (D&C) plan have been implemented (logo, website) and KPIs have been reached. Secondly, this version of the document provides an overview of standardisation activities relevant to TRUSTEE and defines the TRUSTEE standardisation and legislation landscape. We proceed with the analysis of standards and initiatives relevant to TRUSTEE with a special focus on the field of trustworthy and explainable AI, as well as the initiatives significant for facilitating open data spaces. We also state the standards used in the TRUSTEE implementation and pilots, followed by the plan for standardisation activities in the following period.

2 COMMUNICATION ACTIVITIES

Communication in Horizon Europe projects is about reaching out to the society and showing the impact and benefits of EU-funded projects. It also consists of informing and promoting the projects as well as their results and success. Communication concerns multiple audiences beyond the project's own community (including the media and the broad public).

A successful communication strategy includes the establishment of a strong brand identity as well as a solid online presence. Communication activities are crucial for making the project known to the general public.

2.1 VISUAL IDENTITY AND BRAND

2.1.1 LOGO

From the beginning of the project, the D&C team aimed to establish a strong brand identity. Thus, a logo was carefully designed by a professional to meet the project's requirements, along with a logo manual to provide all partners the necessary information for correctly using the logo.

Figure 1: The TRUSTEE Logo

As described in D6.3, the designed logo incorporated rules of semiotics, meaning that each element chosen represents something. To begin with, six shapes were used, as TRUSTEE has six use cases. The shapes chosen were triangles, as

triangles are traditionally related to steadiness, ingenuity, energy, and power. Triangles are often employed in logos for these reasons.

The TRUSTEE logo also uses a specific colour palette to highlight the project's brand identity. First, green was used. Although green traditionally represents the environment, semiotically it also stands for equilibrium and aspiration. Orange was also added as it is a vibrant colour that encourages engagement. Then, yellow was chosen, which conveys warmth, since TRUSTEE aspires to be recognized by the general public. Additionally, blue is employed since it is a colour closely connected with technology and because it also stands for strength, seriousness, and integrity as well as loyalty and security. Last but not least, light blue was selected to symbolize reliability.

The primary typeface used in the logo is "Inter". The typeface has been carefully selected to give prominence to the brand image and must be always used to retain consistency - especially within the logo.

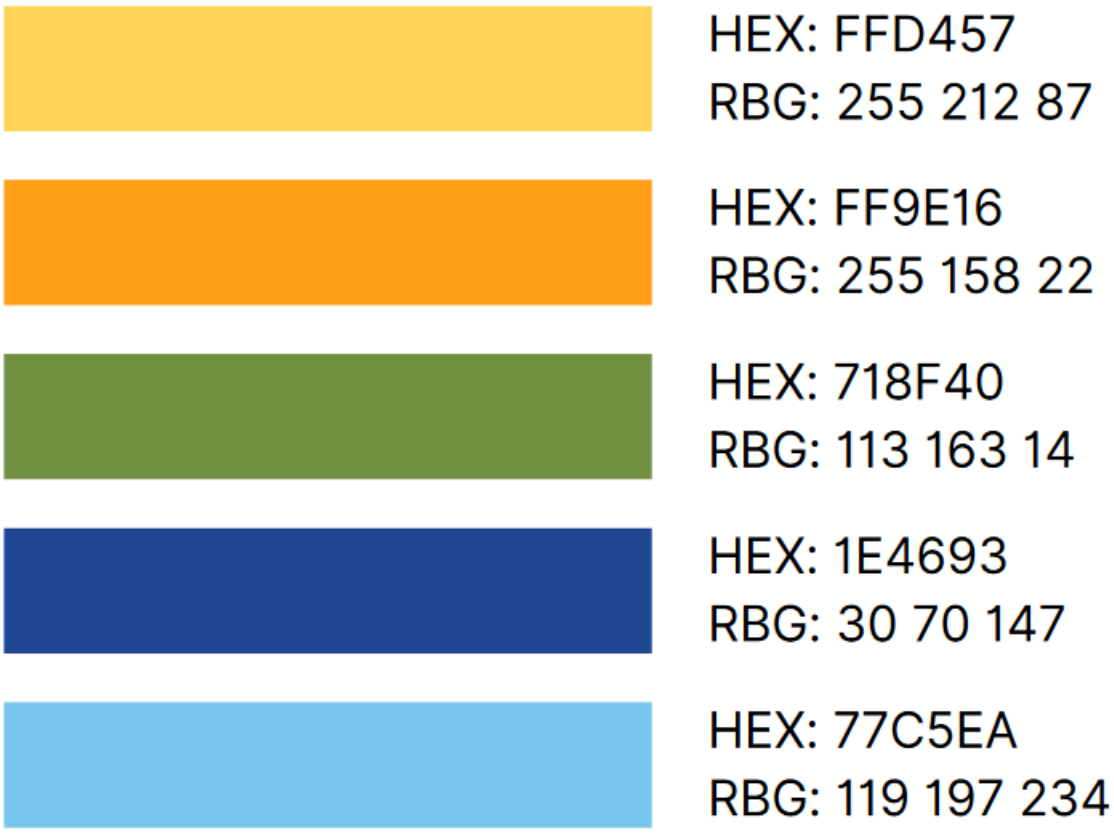

Figure 2: TRUSTEE's Logo Colour Palette

2.1.2 TEMPLATES

As per the project's needs, several templates have been created, incorporating the TRUSTEE brand guidelines. Those include:

- PowerPoint Template: Serves as the basis for presentation creation. Includes official brand colours and official logo.
- Deliverable Template: Serves as the basis for reporting the project activities.
- Meeting Agenda: The basis for an agenda whenever Project Meetings occur.
- Meeting Minutes: Serves as an attendance book and for keeping the meetings' most important notes, as well as the next steps.
- Dissemination activities report template: Needs to be filled whenever a dissemination activity occurs by a partner.
- Internal Review Template: Needs to be filled whenever reviewing a deliverable.

All partners have access to these resources in the project's repository, where the templates are easily accessible for use.

2.2 WEBSITE

A need for a website as well as the establishment of an online presence has arisen over the last years, as a result of the expansion of the internet over the past two decades. TRUSTEE will use its website as its primary medium of communication, which will provide the project's details and updates to all its target audiences.

Towards the goal of having a solid online presence, TRUSTEE has set up its own website since M3. The website URL is: https://horizon-trustee.eu/, emphasizing the link to the European Union.

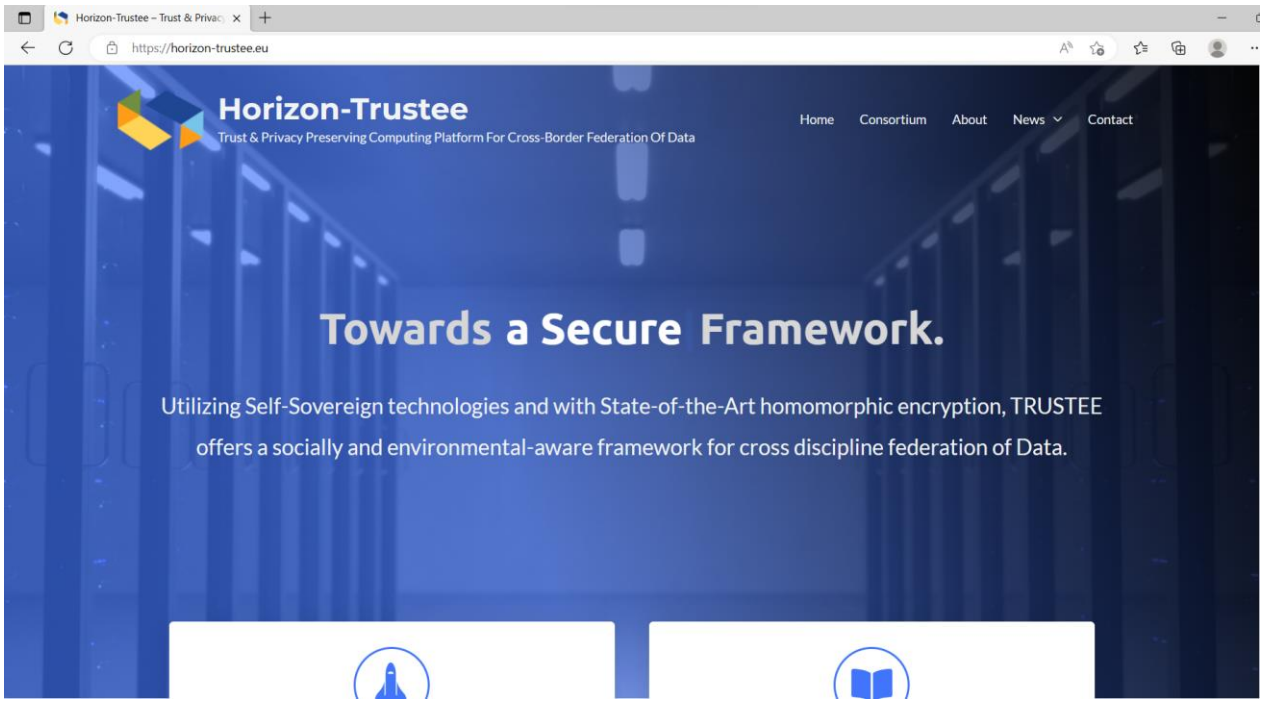

Figure 3: The TRUSTEE website's homepage

Scrolling down, the project's use cases are shortly described, as well as the project's mission, vision, and methodology. Alongside, the information of the Project's Coordinator and Technical Manager (Institution, email and LinkedIn account) are showcased, as well as the partners' logos. On the bottom of the homepage there is the acknowledgement of EU Funds, as the article 17 of the TRUSTEE Grant Agreement states that communication activities of the beneficiaries related to the action (including media relations, conferences, seminars, information material, such as brochures, leaflets, posters, presentations, etc., in electronic form, via traditional or social media, etc.), dissemination activities and any infrastructure, equipment, vehicles, supplies or major result funded by the grant, must acknowledge EU support and display the European flag (emblem) and funding statement (translated into local languages, where appropriate and if needed).

The acknowledgement text is the following:

"Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union. Neither the European Union nor the granting authority can be held responsible for them."

The emblem is distinct and separate, as per the official guidelines [1].

In total, the website contains five (5) tabs, including the "Homepage" one.

The consortium tab (Consortium – Horizon-Trustee) gathers all the partners' logos, along with a small paragraph introducing their company or organization.

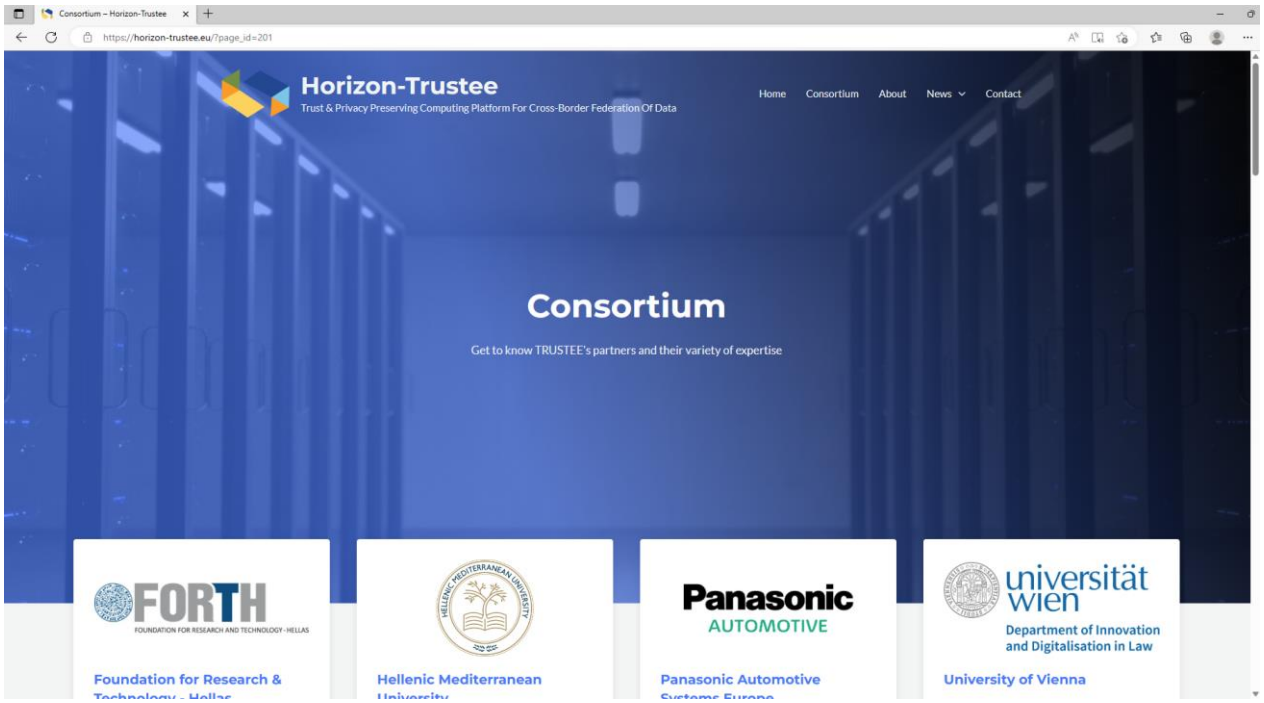

Figure 4: TRUSTEE's Consortium Page

Next, there is the "About" page (About – Horizon-Trustee) which contains basic information about the project.

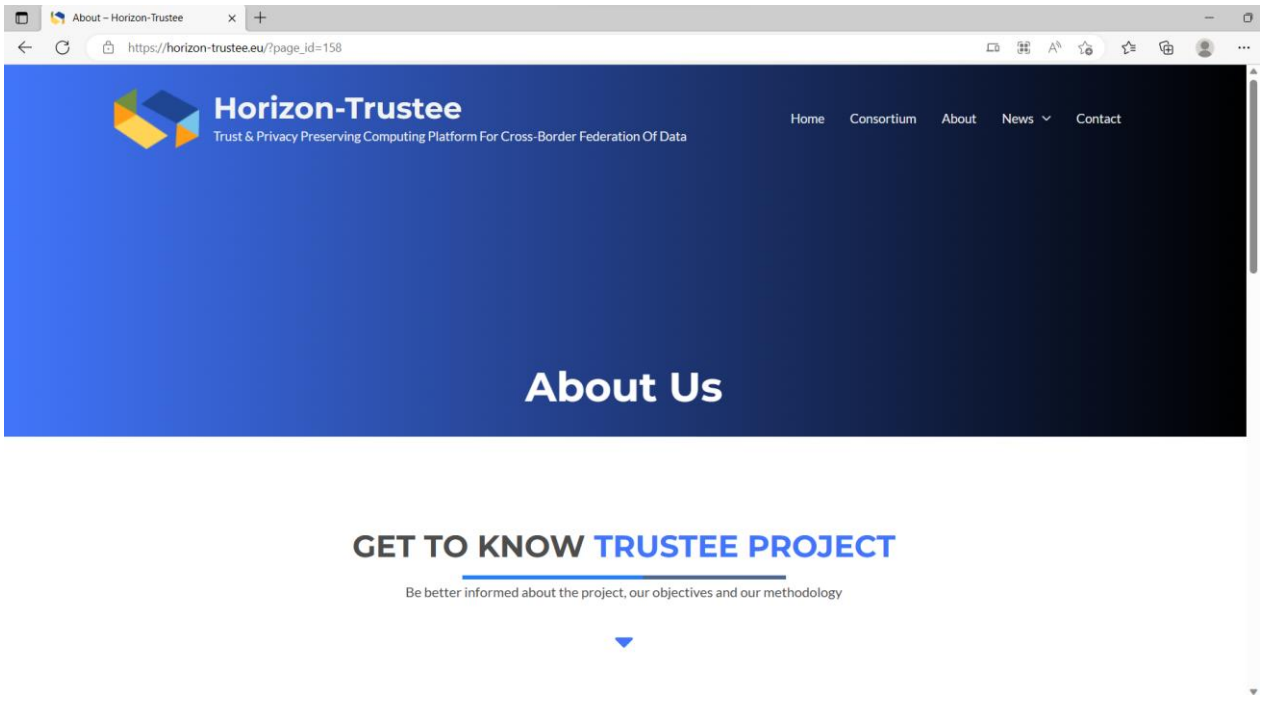

Figure 5: TRUSTEE's About Us Page

Additionally, a "News" page is included. This category contains two subcategories: the "Latest News" one and the "Newsletter" one.

The "Latest News" page (News – Horizon-Trustee) is constantly updated with the project's news, including events that TRUSTEE is attending, synergies with other projects, publication announcements, etc.

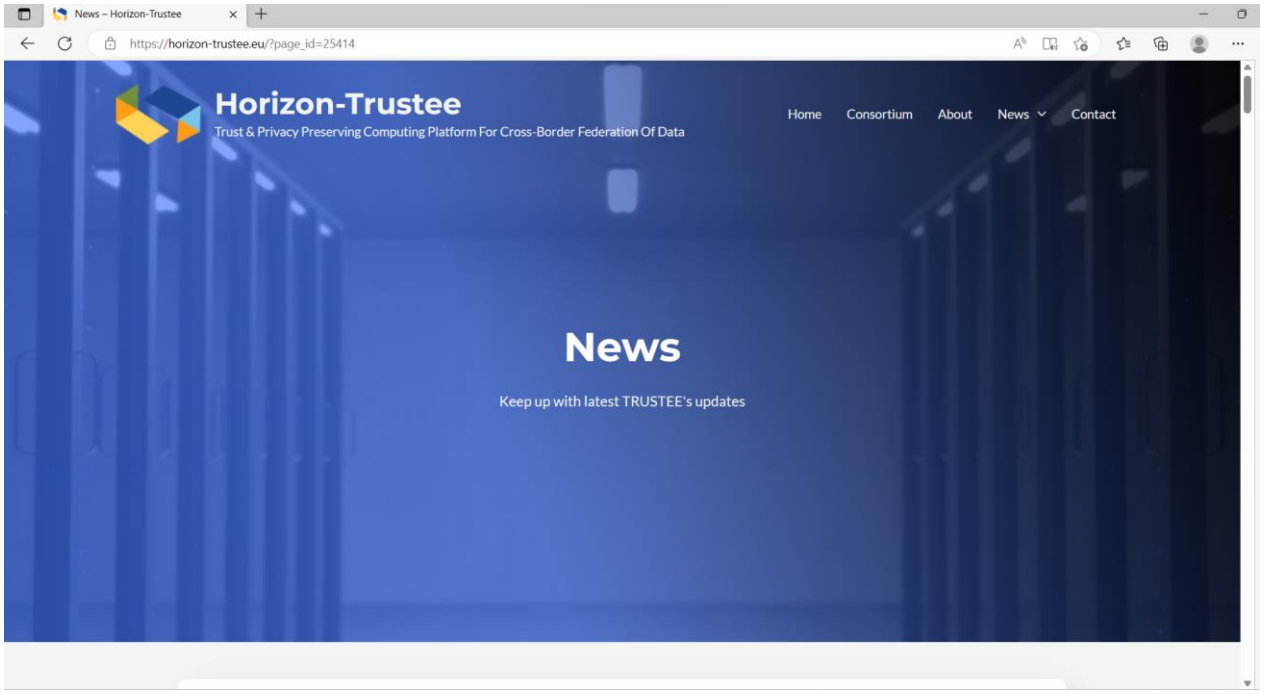

Figure 6: The Latest News page

On the other hand, the "Newsletter" page (Newsletter – Horizon-Trustee) gathers all the available newsletters that have been issued during the project. There is also a subscription box where stakeholders can fill-in their information in order to receive the latest newsletters directly in their mailbox when it is available.

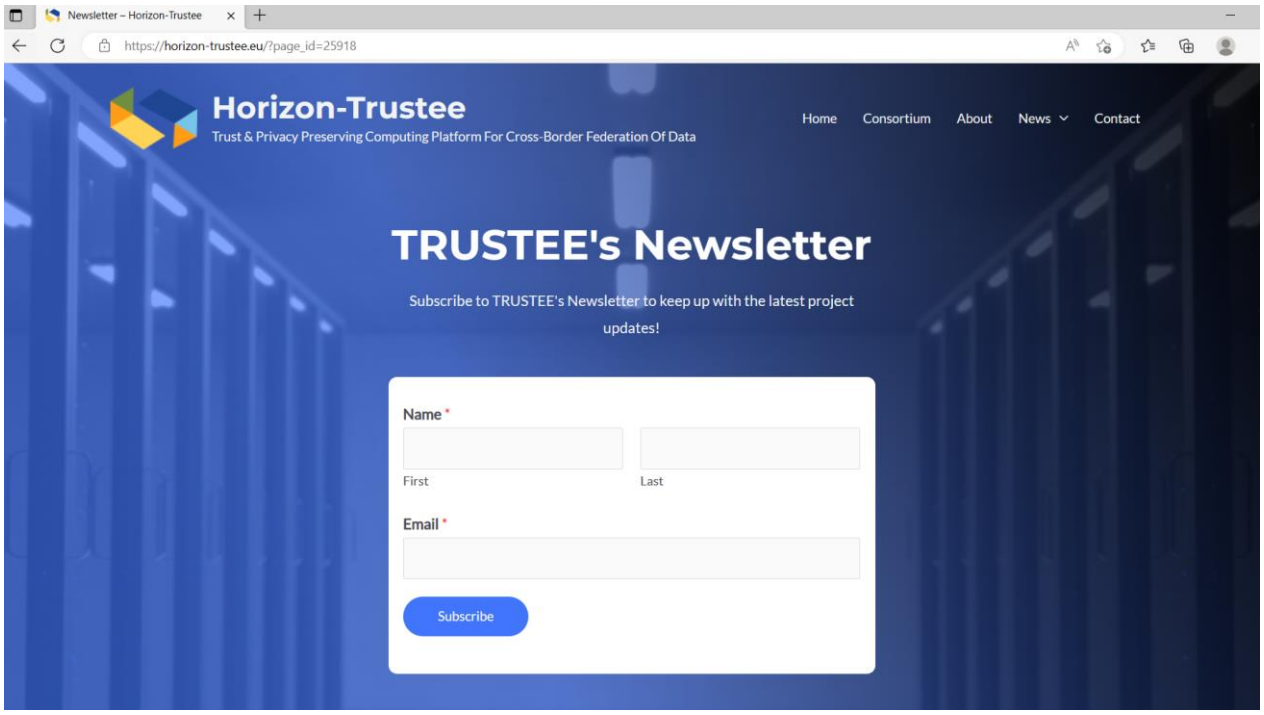

Figure 7: The Newsletter page

2.2.1 MONITORING

The TRUSTEE website is monitored by Google Analytics tools (https://analytics.google.com). The data on the audience activity registered since the launch of the website (August 2022) is summarized in the following figures.

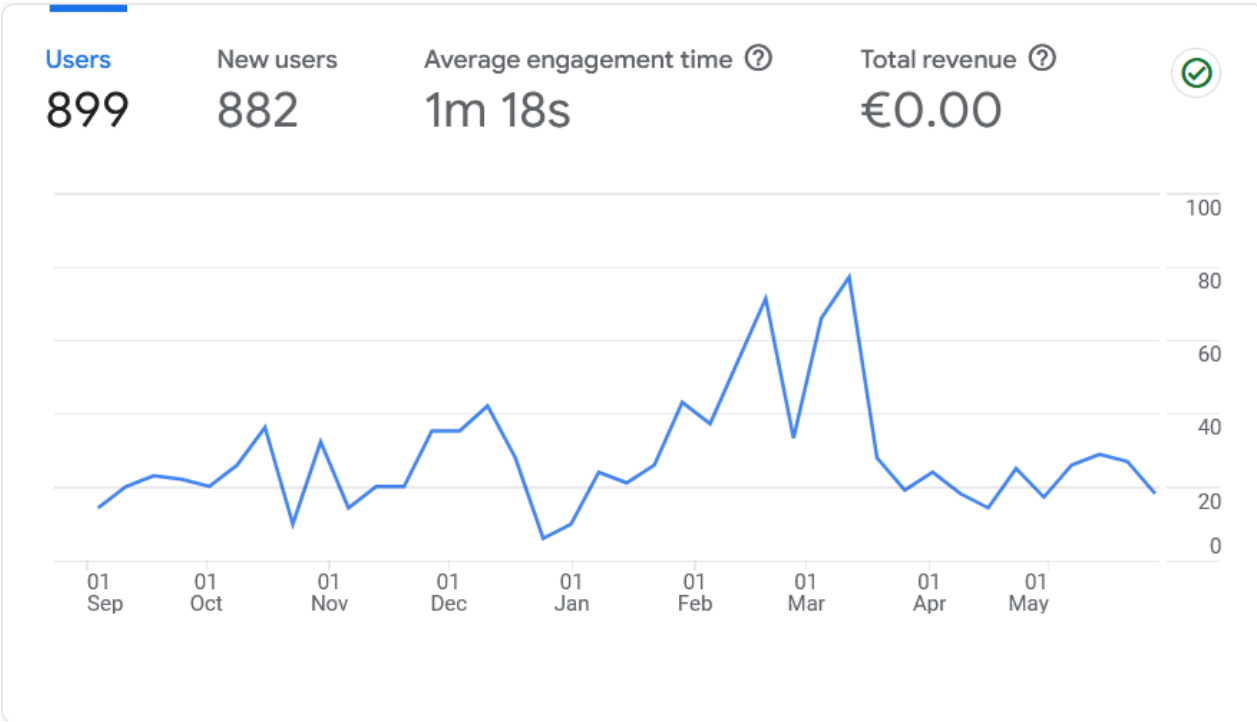

Figure 8: Website's Users via Google Analytics

Figure 9: Website Users by Country via Google Analytics

2.3 INFORMATIVE MATERIAL

Dissemination materials are essential to effectively communicating a Horizon Europe project's goals, results and impact. Thus, a roll-up banner, a brochure, a general presentation and a poster have been developed to aid in the dissemination efforts of the partners. These resources are effective tools for generating interest, involving stakeholders, and promoting project activities and outcomes.

2.3.1 ROLL-UP BANNER

Roll-up banners offer a visually appealing and attention-grabbing display that can be used at conferences, workshops or other events. The TRUSTEE Roll-Up banner was designed to include the project's key information (Grant Agreement ID, Date, Consortium members, brief description of the use cases). The roll-up banner also highlights the project's social media pages, in an attempt to communicate these information channels to the general public and gain engagement.

Figure 10: TRUSTEE's Roll-Up banner

2.3.2 BROCHURE

The TRUSTEE brochure is an informative 2-page flyer that provides a comprehensive overview of the project. It includes key information about the project and describes what the project is trying to achieve as well as its importance to the community. It can be distributed to the general public on various occasions including conferences, seminars, workshops, etc. The Dissemination and Communication Team has printed and distributed brochures to all partners, in order for them to distribute them to interested parties.

Figure 11: Brochure's cover page

Figure 12: Brochure' inner pages

2.3.3 POSTER

Posters are also important for dissemination in a Horizon Europe project as they provide a visual and engaging way to present the project's objectives and key outcomes. Posters facilitate information to a wide audience; thus, they should be easy to understand, even for non-experts. The TRUSTEE poster uses visuals and graphs and concise text to convey information and highlights the impact and relevance of the project in a visually appealing way. Posters have the advantage of being portable and easily shared, thus, the TRUSTEE poster can serve as an alternative in locations where the TRUSTEE banner cannot be transferred. It can be displayed at conferences, exhibitions, workshops, and other scientific events.

Figure 13: The TRUSTEE Poster

2.3.4 GENERAL PRESENTATION

A General Presentation has been also prepared by the Dissemination and Communication Team, to serve as a condensed version of the project's information. The General Presentation that has been prepared has been previously approved by the project's Technical Manager (TM) and Project Coordinator (PC) in order to ensure that no sensitive information will be revealed. Partners are encouraged to showcase the TRUSTEE project and they may use the general

presentation without needing approval from the PC or TM. They are also encouraged to add slides if needed, especially for technical progress/ requirements – in that case, prior approval from the TM or PC is needed.

2.3.5 NEWSLETTER

Newsletters serve as a valuable tool for communication and dissemination throughout the project. They allow the consortium to update stakeholders about the progress, achievements, and outcomes of the project.

Every six (6) months a new issue of the TRUSTEE Newsletters is being published. This helps in engaging and maintaining the interest of these stakeholders throughout the project duration. By publishing a new issue every six months, which includes the progress made during this aforementioned era, a sense of involvement among stakeholders is created, and collaboration can be fostered. Newsletters showcase the innovation and research and provide a platform for sharing these valuable recourses with a broader audience.

Individuals with a keen interest in the TRUSTEE project can subscribe to the newsletter via the project's website (https://horizon-trustee.eu/?page_id=25918) in order to receive it directly to their email address. It is important noting that once the Dissemination Team gathers the data of the stakeholders, data protection and privacy regulations are considered. Newsletters are also available in Zenodo.

2.4 SOCIAL MEDIA

As previously mentioned, with the rapid growth of the internet, social media can play a valuable role in Horizon Europe projects, as they offer a variety of opportunities. Social Media platforms provide an effective means to enhance the visibility of projects, and enable the formation of online communities. They can also provide a convenient and accessible channel for sharing the project's updates, and outcomes. Through posts, key information can be shared, as well as articles, blog posts, publications, videos, infographics, etc. Thus, establishing a strong digital presence was one of the WP's primary goals, in an attempt to increase visibility and attract stakeholders.

2.4.1 LINKEDIN

LinkedIn is a professional networking platform, with over 400 million users, widely used for career-related purposes. TRUSTEE's LinkedIn presence allows it to be promoted to the broader professional community.

It is crucial for European-funded projects to use LinkedIn, as it is a channel that helps connect with professionals, researchers, policymakers, and relevant stakeholders. It is also a great way to build collaborations easily with other European-funded projects that maintain a social presence. LinkedIn can also be used to share project updates, achievements, publications, and events attended, increasing visibility and attracting potential stakeholders.

A project-specific LinkedIn Company Page called "TRUSTEE" was created at the beginning of the project and can be found in: https://www.linkedin.com/company/horizon-trustee. So far, the LinkedIn page is followed by 227 people. The LinkedIn account has been the most exploited social/online communication channel, mainly highlighting the dissemination events and the expertise of the partners, with the weekly posts under the hashtag #introducingourconsortium, whereas all partners provided a paragraph regarding their company or organization and their role in TRUSTEE.

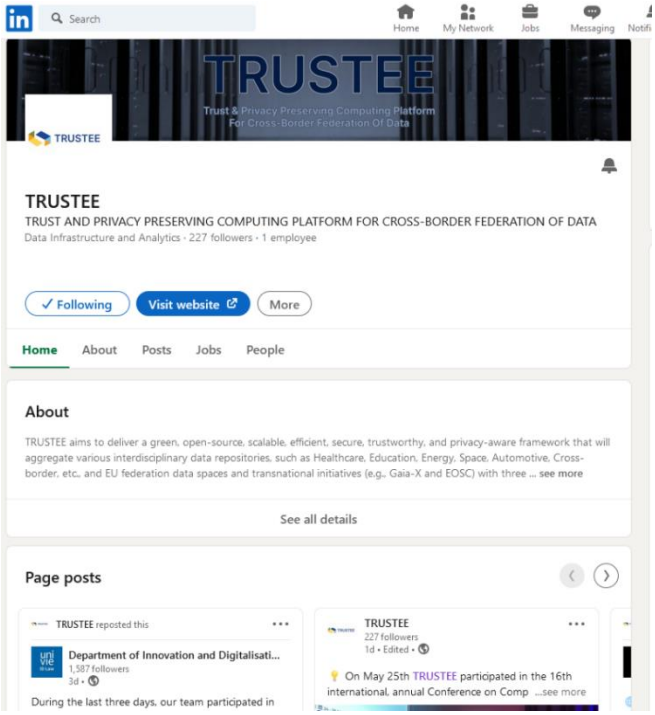

Figure 14: The TRUSTEE LinkedIn page

LinkedIn analytics are closely monitored by the Dissemination Team. Several KPIs, as indicated in the Grant Agreement, have been reached.

Table 1: LinkedIn Analytics

	Reached	KPI for the first year
Followers	227	100
Views	2.450	100
Unique visitors	695	100

2.4.2 TWITTER

Twitter is a microblogging networking platform with over 353 million users, that allows individuals to share short posts called tweets. In most cases, the text content of a tweet can contain up to 280 characters. A Twitter account has been created for the TRUSTEE project, in order to provide users with quick updates on project activities, events, and findings. It is a great tool for direct interaction and engagement with stakeholders, including researchers, organizations, policymakers and the general public. By using relevant hashtags and retweeting (re-sharing) relevant posts, the TRUSTEE project can attract more attention and engagement. TRUSTEE's Twitter account is currently followed by 267 profiles and can be found here: https://twitter.com/TrusteeHorizon.

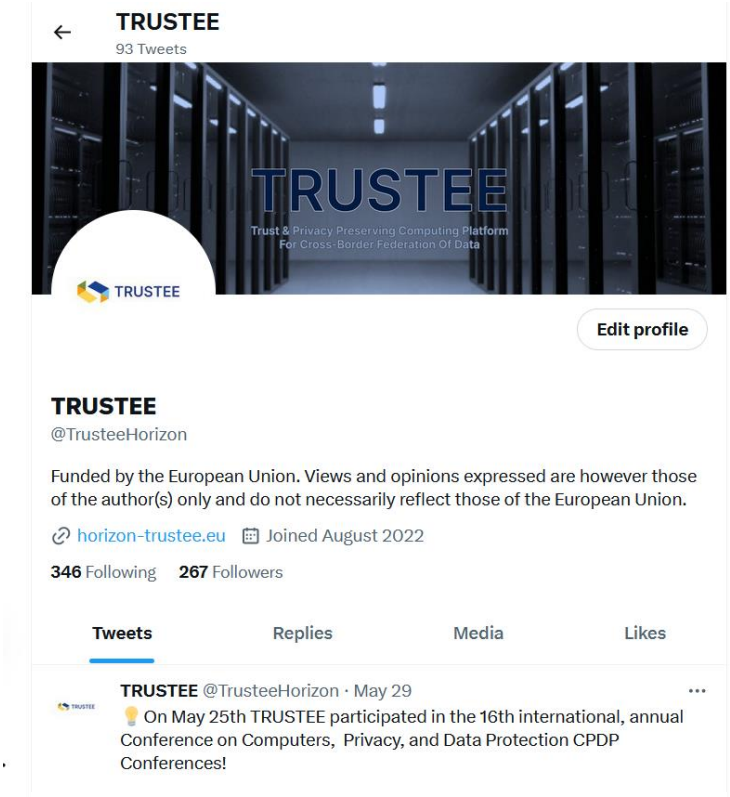

Figure 15: TRUSTEE's Twitter Account

2.4.3 YOUTUBE

YouTube is a video-sharing platform where users can upload, watch and share videos. YouTube provides an excellent chance for exhibiting project-related content and visual storytelling. TRUSTEE's YouTube channel will host an interview with the Technical Management and the Project Coordination Team, within the next months, to help the public better understand TRUSTEE's goals and ambitions. Videos from all the pilot leaders explaining their use cases

will also be uploaded. TRUSTEE's YouTube channel can be found here: https://www.youtube.com/channel/UCO21EsMqdyagAy-cyADQpMg

2.4.4 ZENODO

Zenodo is a social media platform that serves as an open-access online repository for research outputs, including publications. Zenodo can be utilized in the TRUSTEE project by ensuring open access to the project's publications, making them freely accessible to the research community and the public. Zenodo can also host the project's public deliverables and newsletters. The Zenodo community designed for the TRUSTEE project can be found here: https://zenodo.org/communities/trusteeproject/.

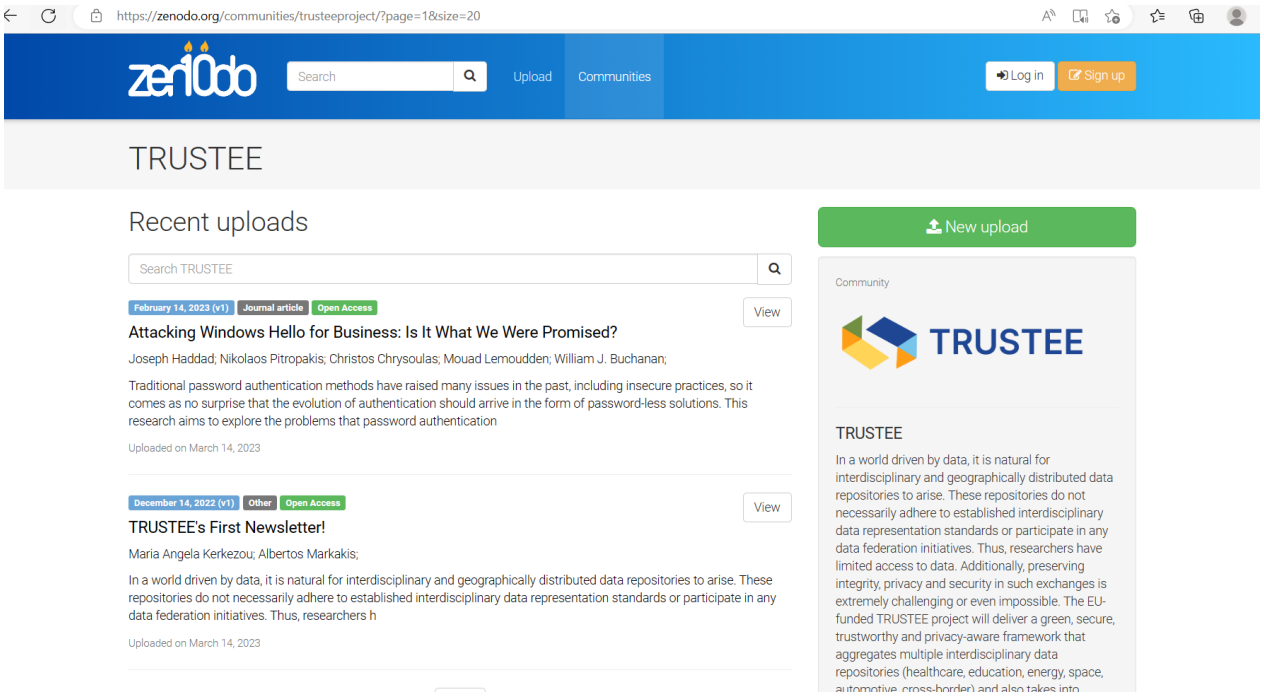

Figure 16: TRUSTEE's community in Zenodo

3 DISSEMINATION ACTIVITIES

Dissemination is about making the findings of a project widely available, not only through scientific publications, but also through other media. Dissemination encourages the circulation of knowledge and results to the ones that can make the best use of them and it enables the value of results to be potentially wider than the original focus. Undoubtedly, it is an essential element of all good research practice and a vital part of the project plan as it strengthens and promotes the profile of the project. Its main focus is the results of the project, and it aims to describe and ensure that these results are available for audiences that may take an interest in the potential use of them.

3.1 PUBLICATIONS

Publications are essential means of disseminating the results of research conducted by a Horizon Europe project. By publishing findings and work performed in scientific journals or presenting them in conferences, the consortium can disseminate the project's results to a wider research community and attract stakeholders. Generally, publications enhance the visibility and impact of projects and also promote their reliability and trustworthiness. It is also important for European citizens to learn about research that positively affects their lives, thus, it is recommended that publications should be open-access. Publications funded by the TRUSTEE project and submitted by M12 include the following:

Table 2: Publication: Accelerating deep neural networks for efficient scene understanding in multi-modal automotive applications

Title	**Accelerating deep neural networks for efficient scene understanding in multi-modal automotive applications**
Author list	Nousias, S., Pikoulis, V., Mavrokefalidis, C., Lalos, A.
Partner(s)	ATHENA
Conference/ Journal	IEEE Access
DOI or Link	https://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=10073550
Status	Published
Abstract	Environment perception constitutes one of the most critical operations performed by semi- and fully- autonomous vehicles. In recent years, Deep Neural Networks (DNNs) have become the standard tool for perception solutions owing to their impressive capabilities in analysing and modelling complex and dynamic scenes, from (often multi-modal) sensory inputs. However, the well-established Performance of DNNs comes at the cost of increased time and storage complexity, which may become problematic in automotive perception systems due to the requirement for a short prediction horizon (as in many cases inference must be performed in real-time) and the limited computational, storage, and energy resources of mobile systems. A common way of addressing this problem is to transform the original large pre-trained networks into new smaller models, by utilizing Model Compression and Acceleration (MCA) techniques, improving both their storage and execution efficiency. Within the MCA framework, in this paper, we investigate the application of two state-of-the-art weight-sharing MCA techniques, namely a Vector quantization (VQ) and a Dictionary Learning (DL) one, as well as two novel extensions, towards the acceleration and compression of

	widely used DNNs for 2D and 3D object-detection in automotive applications. Apart from the individual (uni-modal) networks, we also present and evaluate a multi-modal late-fusion algorithm for combining the detection results of the 2D and 3D detectors. Our evaluation studies are carried out on the KITTI Dataset. The obtained results lend themselves to a twofold interpretation. On the one hand, they showcase the significant acceleration and compression gains that can be achieved via the application of weight sharing on the selected DNN detectors, with limited accuracy loss, as well as highlight the performance differences between the two utilized weight-sharing approaches. On the other, they demonstrate the substantial boost in detection performance obtained by combining the outcome of the two unimodal individual detectors, using the proposed late-fusion-based multi-modal approach. Indeed, as our experiments have shown, pairing the high-performance DL-based MCA technique with the loss-mitigating effect of the multi-modal fusion approach, leads to highly accelerated models (up to approximately 2.5× and 6× for the 2D and 3D detectors, respectively) with the performance loss of the fused results ranging in most cases within single-digits figures (as low as around 1% for the class ‘‘cars’’).

Table 3: Publication: Attacking Windows Hello for Business: Is It What We Were Promised?

Title	**Attacking Windows Hello for Business: Is It What We Were Promised?**
Author list	Haddad, J., Pitropakis, N., Chrysoulas, C., Lemoudden, M., Buchanan, W.J.
Partner(s)	NAPIER
Conference/ Journal	MDPI
DOI or Link	https://www.mdpi.com/2410-387X/7/1/9
Status	Published
Abstract	Traditional password authentication methods have raised many issues in the past, including insecure practices, so it comes as no surprise that the evolution of authentication should arrive in the form of password-less solutions. This research aims to explore the problems that password authentication and password policies present and aims to deploy Windows Hello for Business (WHFB) on-premises. This includes creating three virtual machines (VMs) and evaluating WHFB as a password-less solution

	and showing how an attacker with privileged access may retrieve the end user's domain password from the computer's memory using Mimikatz and describing the possible results. The conducted research tests are in the form of two attack methods. This was feasible by the creation of three VMs operating in the following way. The first VM will act as a domain controller (DC) and certificate authority server (CA server). The second VM will act as an Active Directory Federation Service (ADFS). The third VM will act as the end-user device. The test findings research summarized that password-less authentication is far more secure than the traditional authentication method; this is evidenced throughout the author's tests. Within the first test, it was possible to retrieve the password from an enrolled device for WHFB while it was still in the second phase of the deployment. The second test was a brute-force attack on the PIN of WHFB; since WHFB has measures to prevent such attacks, the attack was unsuccessful. However, even though the retrieval of the password was successful, there are several obstacles to achieving this outcome. It was concluded that many organizations still use password authentication as their primary authentication method for accessing devices and applications. Larger organizations such as Microsoft and Google support the adoption of password-less authentication for end-users, and the current usage of password-less authentication shared by both organizations is encouraged. This usually leads organizations to adopt this new solution for their IT infrastructure. This is because it has been used and tested by millions of people and has proven to be safe. This supports the findings of increased usage and the need for password-less authentication by today's users.

Table 4: Publication: An efficient deep unrolling super-resolution network for lidar automotive scenes

Title	**An efficient deep unrolling super-resolution network for lidar automotive scenes**
Author list	Gkillas, A., Lalos, A., Ampeliotis, D.
Partner(s)	ATHENA
Conference/ Journal	IEEE International Conference on Image Processing 2023

DOI or Link	-
Status	Submitted
Abstract	Considering the high cost of high-resolution Lidar sensors, in this work, a novel Lidar super-resolution method is proposed to improve the performance on numerous autonomous vehicle perception tasks, including that of a Lidar odometer. In more detail, we propose a regularized optimization problem employing a learnable regularizer (neural network) to capture the properties of the data. To efficiently solve this problem, a deep unrolling methodology is proposed, thus forming an interpretable and well-justified deep architecture, where its learnable parameters derived from the solution of the optimization algorithm. Extensive experiments on a real-world lidar odometry application highlight that the proposed model exhibits both superior performance as well as a significantly reduced number of trainable parameters i.e., 99.75% less parameters, as compared to other state-of-the-art deep learning methods.

Table 5: Publication: Reviewing Deep Learning-Based Feature Extractors in a Novel Automotive SLAM Framework

Title	**Reviewing Deep Learning-Based Feature Extractors in a Novel Automotive SLAM Framework**
Author list	Christos Anagnostopoulos, C., Lalos, A., Kapsalas, P., Nguyen, D., Stylios, C.
Partner(s)	ATHENA/ PASEU
Conference/ Journal	31st Mediterranean Conference on Control and Automation
DOI or Link	
Status	Accepted – To appear

Table 6: Publication: Towards building a Self-Sovereign Identity Framework for Healthcare

Title	Towards building a Self-Sovereign Identity Framework for Healthcare
Author list	Spanakis, E., Politis, I., Markakis, E., Bolgouras, V., Angelogianni, A., Grammatopoulos, A., Xenakis, C., Sakkalis, V.
Partner(s)	FORTH / HMU / INQ / ATHENA
Conference/ Journal	IEEE Engineering in Medicine and Biology Society (EMBC 2023)
DOI or Link	
Status	Submitted

Table 7: Publication: Homomorphic Encryption in Clinical Research - an Empirical Study on some Software Libraries

Title	Homomorphic Encryption in Clinical Research - an Empirical Study on some Software Libraries
Author list	Martignano, M., Damiani, A., Gui, D., Magalini, S., Nucciarelli, L., Santoro, G.
Partner(s)	UCSC
Conference/ Journal	IEEE Engineering in Medicine and Biology Society (EMBC 2023)
DOI or Link	
Status	Accepted - To appear

Table 8: Publication: Robust Cooperative Sparse Representation Solutions for Detecting and Mitigating Spoofing Attacks in Autonomous Vehicles

Title	Robust Cooperative Sparse Representation Solutions for Detecting and Mitigating Spoofing Attacks in Autonomous Vehicles
Author list	Piperigkos, N., Lalos, A., Anagnostopoulos, C., Zukhraf, S., Laoudias, C., Michael, M.
Partner(s)	ATHENA
Conference/ Journal	31st Mediterranean Conference on Control and Automation
DOI or Link	
Status	Accepted - To appear

Table 9: Publication: Federated Deep Feature Extraction-based SLAM for Autonomous Vehicles

Title	Federated Deep Feature Extraction-based SLAM for Autonomous Vehicles
Author list	Anagnostopoulos, C., Gkillas, A., Piperigkos, N., Lalos, A.
Partner(s)	ATHENA
Conference/ Journal	24th International Conference on Digital Signal Processing
DOI or Link	
Status	Accepted - To appear

Table 10: Publication: Subspace Parsimonious Dictionary Learning and its use in Federated Learning

Title	Subspace Parsimonious Dictionary Learning and its use in Federated Learning
Author list	Ampeliotis, D., Gkillas, A.
Partner(s)	ATHENA
Conference/ Journal	24th International Conference on Digital Signal Processing
DOI or Link	
Status	Accepted - To appear

Table 11: Publication: Federated Learning for Lidar Super Resolution on Automotive Scenes

Title	Federated Learning for Lidar Super Resolution on Automotive Scenes
Author list	Gkillas, A., Arvanitis, G., Lalos, A., Moustakas, K.
Partner(s)	ATHENA
Conference/ Journal	24th International Conference on Digital Signal Processing
DOI or Link	
Status	Accepted - To appear

It is also worth noting that apart from publications in conferences and academic journals, TRUSTEE has been featured in Ercim News, the quarterly magazine of the European Research Consortium for Informatics and Mathematics. The special theme: Data Infrastructures and Management (ERCIM NEWS No 133) was issued on April 2023 and explores

how TRUSTEE offers a unique solution to one of the most pressing issues in the data science community: how to safely and securely share sensitive data across organizations.

Table 12: A Secure Trustworthy Privacy-preserving Framework for Cross-federation of Data

Title	**A Secure Trustworthy Privacy-preserving Framework for Cross-federation of Data**
Author list	Spanakis, E., Markakis, E., Papatsaroucha, D., Politis, I., Sakkalis, V.
Partner(s)	FORTH, HMU, INQBIT
Magazine	ERCIM News Magazine
Link	https://ercim-news.ercim.eu/en133/special/a-secure-trustworthy-privacy-preserving-framework-for-cross-federation-of-data
Status	Accepted - Published

3.2 EVENTS

Participation in events and conferences is highly important for Horizon Europe projects, for several reasons. Such events offer valuable networking opportunities as engaging with experts in similar fields can promote collaboration, partnerships and knowledge-sharing. In addition, they provide a platform for projects to disseminate their research outcomes and innovations to a broader audience, ensuring visibility and awareness. Finally, participation in conferences enhances the prestige of a project and contributes to maximizing the impact of a project.

TRUSTEE's partners are highly active in disseminating the project to various events, as seen below:

Table 13: EBDVF 2022

Event:	**European Big Data Value Forum 2022 (EBDVF 2022)**
Speaker	Spanakis Emmanouil, FORTH.
Venue	Prague, Czech Republic (hybrid event)

Date	November 21-23, 2022
Abstract	The European Big Data Value Forum is a major ICT event in Europe that brings together industry professionals, business developers, researchers and policy-makers from all over Europe and other regions of the world to advance policy actions, and industrial and research activities in the areas of Data and AI. TRUSTEE was presented during the session "Lessons learnt from Data Platforms projects" that took place the second day of the event (on November 22nd). The first part of this session was dedicated on operationalising the transfer of knowledge and main assets from the Data Platform projects to the current Data Spaces Programme. The second part of the session was designed as a welcome to the new research projects in data sharing in the Common European Data Spaces (funded under Horizon Europe DATA-01-01/DATA-01-03) that have the ambitious challenge of making Europe the most successful area in the world in terms of data sharing and data re-use while respecting the legal framework relating to security and privacy preservation.

Table 14: TIM Conference

Event:	**TIM Conference**
Speaker	Alexandru Nicolin, ISS.
Venue	November 23-25, 2022
Date	Timisoara, Romania
Abstract	A Physics Confefrence, organised by the West University of Timisoara, Faculty of Physics. TRUSTEE was presented in the Theoretical and Computational Physics Section, dedicated to "Statics of moon craters".

Table 15: ELECTRON International Event

Event:	**ELECTRON International Event**
Speaker	Spanakis Emmanouil, FORTH.

Venue	Baku, Azerbaijan (hybrid event)
Date	December 5-7, 2022
Abstract	The event, organised by the ELECTRON project, dealt with issues that are currently threatening the very existence of Europe and the world: the energy crisis and cybersecurity. Modern solutions for protecting the energy and power systems from harmful actions and cyberattacks while empowering the digital culture of European citizens were presented. TRUSTEE was showcased on the second day of the event (on December 6th).

Table 16: "Get-to-know- introductory workshop and welcome day to HE Data projects

Event:	**"Get-to-know- introductory workshop and welcome day to HE Data projects**
Speaker	Spanakis Emmanouil, FORTH.
Venue	Online
Date	February 23, 2023
Abstract	The "Get-to-know- introductory workshop and welcome day to HE Data projects" is an open workshop organised by the BDVA as part of the Data Spaces Support Centre (DSSC) activities. The DSSC is an initiative funded by the European Commission that focuses on accelerating the design and implementation of Data Spaces based on data sharing ecosystems' main pillars such as sovereignty, interoperability, and trust. The Workshop, named "Get-to-know- introductory workshop and welcome day to HE Data projects" presented 26 different European-funded projects from HE Cluster-4.

Table 17: TECH-X Conference Hackathon

Event:	**Tech-X Conference Hackathon**
Speaker	Kourtis Michael-Alexandros, ZORTENET

Venue	Bilbao, Spain
Date	May 3, 2023
Abstract	The Tech-X Hackathon, organised by Gaia-X and the OSS Community, provided a unique opportunity to explore a range of exciting topics, including the Gaia-X Digital Clearing House, confidential computing, ODRL, data exchange, data traceability, critical success factors, ontologies, and open-source technologies. TRUSTEE was presented during "The future of privacy-preserving computation under Gaia-X" Workshop.

Table 18: DEFEA - Defence Exhibition Athens

Event:	**DEFEA - Defence Exhibition Athens**
Stand	Inqbit
Venue	Athens, Greece
Date	May 6-7, 2023
Abstract	A prestigious event, DEFEA showcases the latest developments, technologies and products in the defense and security industry. By participating in this event, the project gained greater credibility.

Table 19: Concentration and Consultation Meeting on Computing Continuum: From Cloud to Edge to IoT

Event:	**Concertation and Consultation Meeting on Computing Continuum: From Cloud to Edge to IoT**
Speaker	Spanakis Emmanouil, FORTH
Venue	Brussels, Belgium
Date	May 10-11, 2023

Abstract	The event, organised by EUCloudEdgeIoT initiative, focused on how to manage services and data across the computing continuum at the junction of Cloud, Edge, and IoT computing. The first day was concertation-focused with many presentations of European-funded projects. Horizon Europe RIAs that started in 2023 showcased their projects and future ambitions, while older initiatives highlighted their successes and lessons learned. TRUSTEE was presented during the first session of the event

Table 20: CPDC Conference

Event:	**Conference on Computers, Privacy and Data Protection (CPDP2023)**
Speaker	Markakis Evangelos (HMU), Tchakarova-Hillman Velislava (EPL), Barud Katarzyna (UNIVIE), Alberto Berreteaga Barbero (TECNALIA)
Venue	Brussels, Belgium
Date	May 24-26, 2023
Abstract	TRUSTEE was presented during the 16th international, annual Conference on Computers, Privacy and Data Protection (CPDP2023). The panel discussed Trustworthy data spaces from the perspective of their developers and users- Current Challenges and the Way Forward. In-depth discussions were held on data spaces and the significance of trustworthiness. Data spaces were defined and developers' roles in implementing robust security measures and privacy-enhancing techniques were highlighted to ensure trust in these data spaces. Then, the role of TRUSTEE was presented. The focus was on TRUSTEE's privacy-enhancing techniques, such as Homomorphic Encryption (HE), Self-Sovereign Identity (SSI), and authorization methods aligned with eIDAS, ensuring privacy preservation during data utilization. Also, a comprehensive introduction to the legal and ethical challenges surrounding data spaces was provided. Speakers also highlighted the importance of ensuring accountability in data spaces through traceability, technical enforceability, and legal frameworks.

Table 21: ENCRYPT Workshop - Clustering with EU projects AI4CYBER, KIANITICS, CROSSCON, CERTIFY, TRUSTEE

Event:	**ENCRYPT Workshop - Clustering with EU projects AI4CYBER, KIANITICS, CROSSCON, CERTIFY, TRUSTEE**

Speaker	Spanakis Emmanouil, FORTH
Venue	Procida, Italy (hybrid)
Date	June 1, 2023
Abstract	ENCRYPT project, which is collaborating with TRUSTEE, organized its first Workshop where TRUSTEE presented an overview of the project and explored possibilities of collaboration with the projects that were invited as well.

Table 22:SS entitled "Recent Advancements in Federated Learning and Applications" in the 24th International Conference on Digital Signal Processing

Event:	**SS entitled "Recent Advancements in Federated Learning and Applications" in the 24th International Conference on Digital Signal Processing**
Speaker	ATHENA
Venue	Island of Rhodes, Greece
Date	June 11th-13th, 2023
Abstract	In the special session, recent advances on Federated Learning were presented and discussed with a special focus on topics related to the TRUSTEE Federated Learning functionality. The audience, comprising researchers working in the general area of Federated Learning, had the opportunity to interact with TRUSTEE researchers to (a) exchange ideas and (b) get familiar with the TRUSTEE project and its envisioned functionality.

Table 23: Data Week 2023

Event:	**Data Week 2023**

Speaker	Markakis Evangelos, HMU
Venue	Lulea, Sweden
Date	June 13th-15th, 2023
Abstract	TRUSTEE project had a remarkable presence at Dataweek 2023, which was organized by BDVA - Big Data Value Association. TRUSTEE's Technical Manager, Prof. Evangelos Markakis, participated in a dynamic panel discussion on the future of dataspaces, where clustering projects were also featured.

3.3 WORKSHOP

The first TRUSTEE Workshop, titled "TRUSTEE Workshop 1.0 – Co-designing Data Spaces: Empowering Usability", was hosted on March 9th, on the premises of the Institute of Space Science, in Magurele, Romania.

The Workshop was co-organized by ADR, EPL and HMU. It was split into three (3) sessions. During the first one, five different EU-funded projects were presented. TRUSTEE presented its personas and requirements and initiated a discussion regarding these topics. TEADAL and TANGO also presented their Requirements, followed by GLASS and AUTOFAIR, which made an overview of the projects. Details about these projects will follow in the next chapter.

In the second half of the workshop, the participants were divided into three working groups to discuss Secondary Use of data. It is worth mentioning that the event was disseminated through Eventbrite, and the attendees were asked to fill-in a registration form before registering for the event. Attendees indicated their domain of experience, their level of technical expertise, data activities they encounter daily, their job title and their organisation. Based on the answers, the Workshop organisers splatted the attendees into three working groups, ensuring the variety of each group, in an attempt for all domains to have an equal say. Each group had representatives from several domains, as well as technical and non-technical participants. The discussions were lively, and the participants shared their perspectives and concerns. Moderators from each group lead the discussions, and assigned rapporteurs took notes, that were later discussed.

The third session of the Workshop was titled: Legal Requirements and socio-ethical requirements and aimed to identify the basic awareness and understanding of the participants regarding privacy laws, requirements, and the socio-ethical impact of data use. Again, participants that participated in discussions were split into the aforementioned working groups.

Valuable input was gathered during the TRUSTEE Workshop 1.0 – Co-designing Data Spaces: Empowering Usability, and can be found on the official report of the Workshop included in D2.1, as it was both part of WP2 and WP6 activities.

3.4 LIAISON ACTIVITIES

Liaison activities aim to facilitate the exchange of information between the project consortium and external entities and establish connections and build relationships with other stakeholders, for instance other research projects. So far, the TRUSTEE project has established a collaboration with 6 other European-funded projects: TANGO, TEADAL, AUTOFAIR, GLASS, OASEES and ENCRYPT. TRUSTEE is also a member of the EUCloudEdgeIoT community, an initiative that aims to release a pathway for the understanding and development of Cloud, Edge, and Internet of Things (CEI) Continuum by fostering cooperation between a wide range of research projects, developers and suppliers, business users, and potential adopters of this new technological paradigm.

3.4.1 TANGO PROJECT

TRUSTEE first initiated a collaboration with the TANGO project on November 2022. TRUSTEE's and TANGO's representatives have met three times online, in order to further explore the possibilities of the collaboration and the areas they could cluster. TANGO also participated in TRUSTEE Workshop 1.0 - Co-designing Data Spaces: Empowering Usability, which took place in March 2023.

Table 24: Collaboration with the TANGO Project

Project Name:	**TANGO**
Website:	https://tango-project.eu/
Cordis:	https://cordis.europa.eu/project/id/101070052
Topic:	HORIZON-CL4-2021-DATA-01-01 - Technologies and solutions for compliance, privacy preservation, green and responsible data operations (AI, Data and Robotics Partnership) (RIA)
Brief Description as showcased on TANGO's website:	The TANGO project will develop a solution for secure, trustworthy, and environmentally sustainable data management. Core components of TANGO solution include: data governance framework, distributed privacy-preserving data management and storage, distributed trust management framework, and artificial Intelligence based framework for green and trustworthy operations

3.4.2 TEADAL PROJECT

TRUSTEE first contacted the TEADAL project in November 2022. So, far five meetings have been performed between TRUSTEE's and TEADAL's representatives, in order to delve deeper into the potential for collaboration and identify areas of common interest where they can group together. TEADAL also participated in TRUSTEE Workshop 1.0 - Co-designing Data Spaces: Empowering Usability, which took place in March 2023. It was also discussed to plan a joint workshop in the Fall of 2023.

Table 25: Collaboration with the TEADAL Project

Project Name:	**TEADAL**
Website:	https://www.teadal.eu/
Cordis:	https://cordis.europa.eu/project/id/101070186
Topic:	HORIZON-CL4-2021-DATA-01-01 - Technologies and solutions for compliance, privacy preservation, green and responsible data operations (AI, Data and Robotics Partnership) (RIA)
Brief Description as showcased on TEADAL's website:	TEADAL will enable the creation of trusted, verifiable, and energy-efficient data flows, both inside a data lake and across federated data lakes, based on a shared approach for defining, enforcing, and tracking data governance requirements with specific emphasis on privacy/confidentiality. The proposed stretched data lake, i.e., deployed in the continuum, will be based on an innovative control plane able to exploit all the controlled/owned resources, across clouds and at the edge, to improve data analysis.

3.4.3 GLASS PROJECT

TRUSTEE first contacted the GLASS project on November 2022, following NAPIER's suggestion (NAPIER is a common partner for the two projects). Until now, representatives from both projects have met twice to discuss fields of collaboration. GLASS presented its case in the TRUSTEE Workshop 1.0 - Co-designing Data Spaces: Empowering Usability, which took place in March 2023 and invited TRUSTEE to their own Workshop (the date has not been yet finalized). It is worth noting that GLASS is an Horizon2020 project, and not a Horizon Europe one as the other projects TRUSTEE is clustering with.

Table 26: Collaboration with the GLASS Project

Project Name:	**GLASS**

Website:	https://www.glass-h2020.eu/
Cordis:	https://cordis.europa.eu/project/id/959879
Topic:	DT-GOVERNANCE-05-2018-2019-2020 - New forms of delivering public goods and inclusive public services
Brief Description as showcased on GLASS' website:	GLASS introduces novel governance services facilitating free movement to citizens and businesses, producing strong social, societal, economic, technological and scientific impact and leading to an advanced e-government solution aligned fully with the EU eGovernment Action Plan 2016-2020 and the EU Digital Single Market strategy.

3.4.4 AUTOFAIR PROJECT

TRUSTEE first contacted the Autofair project in July 2022, following NAPIER's suggestion (NAPIER is a common partner for the two projects). Various emails have been exchanged between representatives of the two projects, and a meeting was held to explore potential future activities. AUTOFAIR actively participated in the TRUSTEE Workshop 1.0 - Co-designing Data Spaces: Empowering Usability, by presenting its case and initiating discussions.

Table 27: Collaboration with the AUTOFAIR Project

Project Name:	**AUTOFAIR**
Website:	-
Cordis:	https://cordis.europa.eu/project/id/101070568
Topic:	HORIZON-CL4-2021-HUMAN-01-01 - Verifiable robustness, energy efficiency and transparency for Trustworthy AI: Scientific excellence boosting industrial competitiveness (AI, Data and Robotics Partnership) (RIA)
Brief Description as showcased on CORDIS	Artificial intelligence powers a growing number of systems today. This is why it's important to make sure the AI algorithms work correctly. In this context, the EU-funded AutoFair project will focus on the issue of fairness. Specifically, it will deal with the design of explainable and transparent AI algorithms. AutoFair aims to improve the algorithms themselves while

	educating end users. It draws on knowledge from computer and data sciences, control theory, optimisation and other scientific disciplines, including ethics and law. Three case studies will be carried out to test the findings on the automation of fair evaluation in recruitment, the elimination of gender inequality in advertising and the elimination of discrimination against bank clients.

3.4.5 OASEES PROJECT

On May 3rd, 2023, OASEES and TRUSTEE participated together in "The future of privacy-preserving computation under Gaia-X" Workshop, during the Tech-X Conference Hackathon, in Bilbao, Spain. TECNALIA, a partner in both consortiums, co-hosted this event. TRUSTEE and OASEES will be investigating additional areas of joint activities and initiating discussions regarding technical collaborations.

Table 28: Collaboration with the OASEES Project

Project Name:	**OASEES**
Website:	https://oasees-project.eu/
Cordis:	https://cordis.europa.eu/project/id/101092702
Topic:	HORIZON-CL4-2022-DATA-01-03 - Programming tools for decentralised intelligence and swarms (RIA)
Brief Description as showcased on OASEES' website:	The OASEES project will deliver a European, fully open-source, decentralized, and secure Swarm programmability framework for edge devices and leveraging various AI/ML accelerators (FPGAs, SNNs, Quantum) while supporting a privacy-preserving Object ID federation process.

3.4.6 ENCRYPT PROJECT

ENCRYPT reached out to TRUSTEE in March 2023. A meeting between representatives of the two projects took place shortly after in order to identify common areas of research and possible collaborations. TRUSTEE also participated in ENCRYPT's Workshop on the 1st of June 2023, in Procida, Italy.

Table 29: Collaboration with the ENCRYPT Project

Project Name:	ENCRYPT
Website:	https://encrypt-project.eu/
Cordis:	https://cordis.europa.eu/project/id/101070670
Topic:	HORIZON-CL3-2021-CS-01-04 - Scalable privacy-preserving technologies for cross-border federated computation in Europe involving personal data
Brief Description as showcased on ENCRYPT's website:	ENCRYPT will develop a scalable, practical, adaptable privacy preserving framework, allowing researchers and developers to process data stored in federated cross-border data spaces in a GDPR compliant way. Within this framework, a recommendation engine for citizens and end-users will be developed, providing them with personalized suggestions on privacy preserving technologies depending on the sensitivity of data and the accepted trade-off between the degree of security and the overall system performance.

3.4.7 EUCLOUDEDGEIOT COMMUNITY

EUCLOUDEDGEIoT Community[1] an initiative, funded by the European Union, with the main goal to realise a pathway for the understanding and development of the Cloud, Edge and IoT Continuum, by promoting cooperation between a wide range of research projects. So far, 30 EU-funded projects are part of this initiative.

TRUSTEE actively participates in the monthly meetings EUCloudEdgeIoT holds, where all partner projects are gathered and discuss possible collaborations and recent achievements. TRUSTEE's Project Coordinator also participated in the "Concentration and Consultation on Computing Continuum: From Cloud to Edge to IoT" Event which took place in Brussels, on May 10th and 11th.

4 COMMUNICATION AND DISSEMINATION KPIS

[1] https://eucloudedgeiot.eu

A set of KPIs has been established on D6.3: TRUSTEE Communication and Dissemination Strategy and Plan. The aforementioned KPIs are expected to be met by the end of the project. During the first year of the project, the implemented status reports as following:

Table 30: Communication and Dissemination KPIs

Medium/ Channel	KPIs	Target Value	Implemented already/ Status
Articles	Number of articles that will be uploaded to TRUSTEE's website	10	19 (1 blog post, 18 news articles)
	Number of unique readers	150	899 unique users
Publications	Number of publications to disseminate scientific and technical results and findingswith regular exposure in internationally recognized scientific and academic journalsduring the course of the project (by all partners)	>10 publications	11 publications
Interviews	Number of ongoing interview series with keytechnical experts, end users and stakeholders	5 interviews	Interview with the Technical Manager to be edited, preparation of the2nd interview with the Project Coordinator
	Numbers of readers interviews will target foreach piece	150 unique readers	

Video	Number of professional videos to be produced introducing the key challenges, innovations, and objectives of TRUSTEE and its consortium	2 videos	1st Video (Interview with the Technical Manager) to be uploaded
	Number of viewers	150	-
Events and Conferences	TRUSTEE partners will participate in European and international conferences where TRUSTEE project can be presented	>5	11
Workshops	Organisation of industry focused events to disseminate information and outputs of the project	>2	1
Social Media-LinkedIn	Number of LinkedIn observers	250 followers	227 followers and 732 unique visitors
Social Media-Twitter	Number of Twitter followers	150 followers	267 followers
Website	Number of visitors	>40K	5K visitors' views during the first year
Liaison/ Clustering	Collaborations with other on-going similar projects (e.g. approved in the same call) to take advantage of chances for knowledge exchange and to increase dissemination among the target population	>2	6

5 STANDARDISATION

During the next section, information on standardisation and report on the activities of T6.5 "Standardisation and Empowering European Data Spaces" will be provided. The following versions of this deliverable will present the updates on the progress of T6.5 following the TRUSTEE standardisation plan. The main objectives of T6.5 are:

- to investigate current legislation and standardisation landscape relevant to TRUSTEE,
- to explore the potential for engaging in standardisation activities based on TRUSTEE outcomes,
- to define a robust standardisation strategy for TRUSTEE standardisation activities based on project objectives and identified standardisation gaps.

This version of the document provides an overview of standardisation activities relevant to TRUSTEE and defines the TRUSTEE standardisation and legislation landscape. It also brings a description of the TRUSTEE standardisation plan, followed by the analysis of standards and initiatives relevant to TRUSTEE with a special focus on the field of trustworthy and explainable Artificial Intelligence (AI), as well as the initiatives significant for facilitating open data spaces. We also state the standards used in the TRUSTEE implementation and pilots. The details about the TRUSTEE standardisation survey and the survey results are provided, followed by the section containing the information on TRUSTEE's application for the Horizon Standardisation Booster support. The report on standardisation activities within the first 12 months of the project is finalized with a conclusion and the next steps for standardisation activities in the following reporting period.

5.1 RELEVANCE AND BENEFITS OF STANDARDISATION

Standardisation, as an activity of determining common terminologies, rules, features, requirements and methodologies, has a relevant role in ensuring that systems are developed and deployed in a way that is consistent with ethical and legal principles. As such, the objectives of the TRUSTEE standardisation activities will lead to TRUSTEE using the existing standards in the field, but also to contribute to the ongoing and new standardisation activities where standardisation gaps are identified.

As an example, demonstrating the relevance of standards and regulations, the European Union's General Data Protection Regulation (GDPR) can be observed. It requires that systems are designed to respect individuals' privacy rights, and standardisation can assist in ensuring that these requirements are met. One of the increasing efforts in terms of standardisation in the field relevant for TRUSTEE is focusing on ensuring that AI systems are transparent, explainable, and accountable so that stakeholders can understand how decisions are being made and challenge those decisions if necessary. In the stated case, the goal of standardisation initiatives is to provide a framework for ensuring that AI systems are transparent, reliable, and ethical. This is particularly important given the increasing use of AI in critical areas such as healthcare, finance, and criminal justice.

Another example relevant for TRUSTEE is related to empowering European data spaces, where standardisation can help ensure that data can be shared and used more effectively across borders and between different organizations. This is important for driving innovation and economic growth, as well as for addressing societal challenges such as climate

change and public health. Hence, standardisation and legislation efforts are of critical importance to realize the full potential of European data spaces.

Based on the provided examples, it is easy to notice the significant benefits of standardisation, legislation, and regulations in terms of facilitating legal and ethical practices, ensuring interoperability, and enabling innovation, hence becoming a motivation for TRUSTEE to use existing and contribute to new standards, i.e., for TRUSTEE to become a part of its standardisation landscape, described in the next section.

5.2 STANDARDISATION LANDSCAPE OVERVIEW

The standardisation and legislation landscape of the TRUSTEE project consists of a diverse set of entities that are working on developing and implementing standards and guidelines that promote interoperability, data sharing, and explainable and trustworthy AI. Such entities include regulatory bodies, standardisation and legislation organisations, committees and working groups within those organisations, trade associations, standardisation initiatives, and also projects within the field related to the TRUSTEE project participating in standardisation activities.

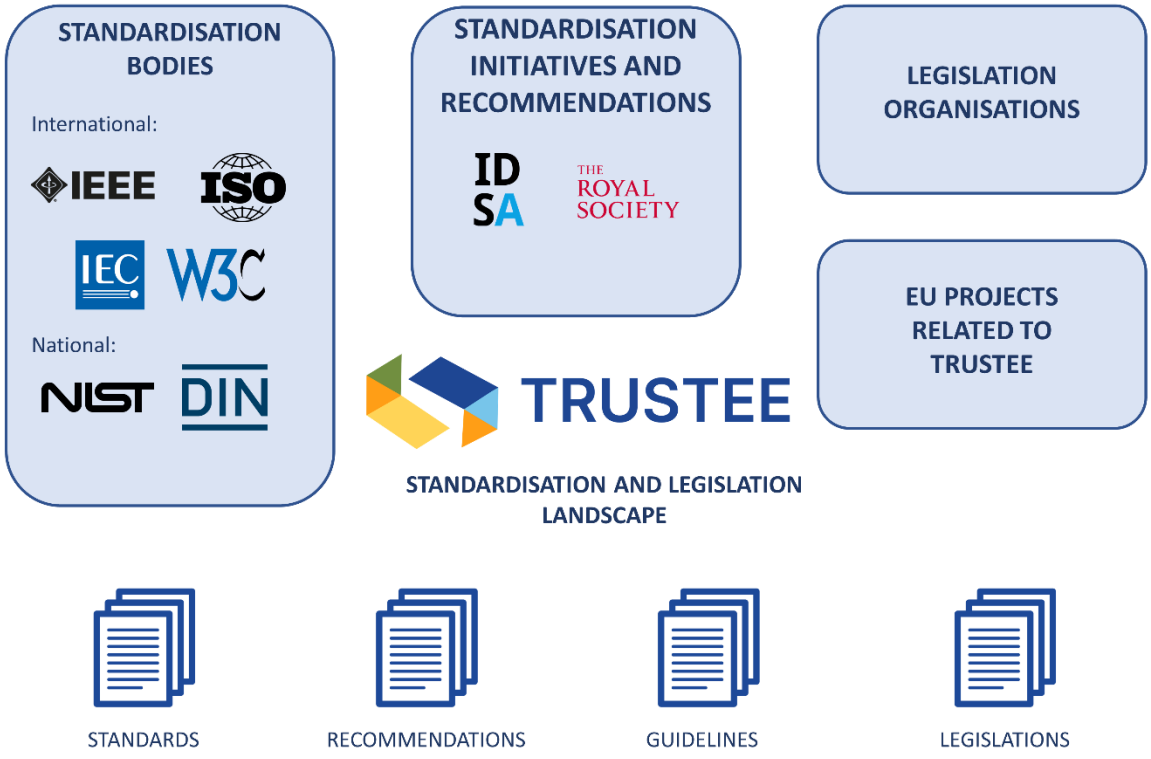

Figure 17 TRUSTEE standardisation and legislation landscape

The entities produce artefacts such as standards, specifications and recommendations with different levels of details, requirements, rules or guidelines. Additionally, standardisation entities operate on different levels in the territorial

sense, meaning they produce documents with different levels of application, i.e., global, international or national levels. Figure 17 summarises participating parties within the TRUSTEE standardisation landscape.

5.3 TRUSTEE STANDARDISATION PLAN

One of the objectives of Task 6.5 "Standardisation and Empowering European Data Spaces" is to develop the standardisation plan for TRUSTEE, which is described in this section. The main purpose of the standardisation plan is to define a robust standardisation strategy for the project based on the TRUSTEE results and the current state of the TRUSTEE standardisation landscape, i.e., existing standards and standardisation activities relevant for the project.

The participation of TRUSTEE in the identified standardisation landscape can be realized in two ways. The first one assumes incorporating relevant standards during the development and implementation of the TRUSTEE platform. The second one is to identify the potential for new standardisation activities and to contribute to ongoing standardisation activities, based on the identified gaps and the knowledge of standardisation efforts currently in progress. To tackle both stated ways in which TRUSTEE can integrate existing standards and contribute to future ones while achieving the maximum impact, the following phases of the standardisation plan were defined:

- Phase 1: Analysis of the current TRUSTEE Standardisation Landscape
- Phase 2: Identification of the standardisation gaps in the fields relevant for the project
- Phase 3: Identifying ways to contribute and contributing to the standardisation activities

In the first phase, the analysis of the existing standards, initiatives, legislations, and recommendations relevant for TRUSTEE was performed. The results of the work done by M12 are documented in Section "Overview of the standardisation activities relevant for TRUSTEE" of this deliverable. This analysis will be expanded until M18 with additional research and will be followed by continuous monitoring of the development of emerging standards, legislations, recommendations, and other standardisation activities throughout the duration of the project to be able to identify the appropriate contribution that TRUSTEE can provide.

The focus of the second phase of the standardisation plan is on the identification of the standardisation gaps in the fields relevant to the project. This phase overlaps with Phase 1 of the standardisation plan and was initiated by conducting the standardisation survey among project partners at the end of M10. The goal of the survey was to assess previous involvement and experience in standardisation among TRUSTEE partners, to examine their interest in participating in future standardisation activities, as well as to evaluate which standardisation topics are perceived relevant for TRUSTEE and the identified standardisation gaps. More details on the survey, as well as the analysis of the results, can be found in the section "TRUSTEE Standardisation survey".

The third phase of the standardisation plan consists of identifying ways to contribute to the ongoing or initiating new standardisation activities and, finally, contributing to those activities. Due to the progress of the TRUSTEE platform development and the progress of Phases 1 and 2 of the TRUSTEE standardisation plan, this phase is planned to start after M12 of the project. For this phase of the standardisation plan, we find the application for the Horizon

Standardisation Booster[2] as a significant action that will facilitate TRUSTEE's dialogue with the standardisation organisations and enable contribution to TRUSTEE's standardisation landscape. More details on TRUSTEE's application for the Horizon Standardisation Booster Open Call can be found in the Section "Horizon Standardisation Booster Application". Since one of the expected outcomes of the Horizon Standardisation Booster Open Call application is a suggestion on the participation in future standardisation activities and collaboration with standardisation organisations, we will include the proposed activities in this phase of the standardisation plan and report the activities in the following versions of this deliverable. Depending on the activities suggested by the Horizon Standardisation Booster and the progress of the TRUSTEE platform development, we might also perform another standardisation survey in the second year of the project to examine if additional standardisation gaps were identified in the meantime.

5.4 OVERVIEW OF STANDARDISATION ACTIVITIES RELEVANT TO TRUSTEE

In this section, we list standardisation activities directly related to the TRUSTEE's scope and objectives. Such standardisation efforts were identified in the following areas: explainable and trustworthy AI, standards related to open data sharing and empowering (European) data spaces, and standards used in TRUSTEE platform implementation, e.g., for defining TRUSTEE architecture, implementing Architecture Building Blocks (ABBs), and those used in TRUSTEE pilots. Since for some of the emerging relevant topics there are not many existing standardisation activities, we also list initiatives and recommendations, in addition to the standards.

The provided overview will be expanded with additional research that will be conducted until M18, however, we are going to update the list continually until the end of the project, due to the emerging standardisation activities that might appear in the meantime, especially related to the new standardisation areas, such as the ones identified as relevant for TRUSTEE.

5.4.1 STANDARDISATION ACTIVITIES IN THE FIELD OF EXPLAINABLE AND TRUSTWORTHY AI

Standardisation activities in the field of AI explainability contain efforts aimed at establishing common guidelines, frameworks, and best practices for developing explainable and trustworthy Machine Learning (ML) models and AI systems. These activities are important because they help ensure that AI systems are transparent, accountable, and trustworthy, which is critical for their adoption and use in various industries, especially those dealing with sensitive data. Some of the relevant standardisation activities in the field of AI explainability are listed below.

[2] https://www.hsbooster.eu/

IEEE P7003 [2]: This is a standard under development by the Institute of Electrical and Electronics Engineers (IEEE) that provides a framework for algorithmic bias and fairness considerations in AI systems. The standard describes specific methodologies to help users certify how they worked to address and eliminate issues of negative bias in the creation of their algorithms, where negative bias infers the usage of overly subjective or uniformed data sets or information known to be inconsistent with legislation concerning certain protected characteristics; or with instances of bias against groups not necessarily protected explicitly by legislation, but otherwise diminishing stakeholder or user well-being and for which there are good reasons to be considered inappropriate. Possible elements include benchmarking procedures and criteria for the selection of validation data sets for bias quality control; guidelines on establishing and communicating the application boundaries for which the algorithm has been designed and validated to guard against unintended consequences arising from the out-of-bound application of algorithms; suggestions for user expectation management to mitigate bias due to incorrect interpretation of systems outputs by users (e.g., correlation vs. causation)

ISO/IEC JTC 1/SC 42 [3]: This is a subcommittee of the International Organization for Standardisation (ISO) and the International Electrotechnical Commission (IEC) that focuses on standardisation in the field of AI. They are working on developing standards related to the explainability, transparency, and accountability of AI systems. ISO/IEC 23894:2020 is a standard for the transparency of AI systems developed by the subcommittee providing a framework for assessing the transparency of AI systems and ensuring that they can be understood by stakeholders.

Partnership on AI [4]: The Partnership on AI is a collaboration between technology companies, research institutions, and non-profit organizations that is focused on advancing AI responsibly and ethically. They have developed a set of best practices for explainable AI, which includes recommendations for transparency, interpretability, and human-centred design.

Ethics guidelines for trustworthy AI [5]: Ethics guidelines for trustworthy AI are a set of guidelines by the High-Level Expert Group on AI presented on 8th of April 2019. According to the Guidelines, trustworthy AI should be lawful (respecting all applicable laws and regulations), ethical (respecting ethical principles and values), and robust (from a technical perspective while taking into account its social environment). Additionally, transparency and accountability of the AI systems are defined.

G20 AI Principles [6]: The G20 AI Principles are a set of principles that were developed by the Group of Twenty (G20) countries to guide the development and deployment of AI. One of the principles focuses on transparency and explainability, stating that AI systems should be designed in a way that enables stakeholders to understand their functioning.

CEN-CENELEC JTC 21 'Artificial Intelligence' [7] is a joint technical committee by CEN and CENELEC' based on the recommendations presented in the CEN-CENELEC response to the EC White Paper on AI, the CEN-CENELEC Focus Group Road Map on Artificial Intelligence, and the German Standardisation Roadmap for Artificial Intelligence. The Joint Technical Committee is responsible for the development and adoption of standards for AI and related data, as well as providing guidance to other Technical Committees concerned with AI. CEN-CLC/JTC 21 identifies and adopts international standards already available or under development from other organizations like ISO/IEC JTC 1 and its subcommittees, such as SC 42 Artificial Intelligence. Furthermore, CEN-CLC/JTC 21 focuses on producing standardisation deliverables that address European market and societal needs, as well as underpinning EU legislation, policies, principles, and values.

ETSI Industry Specification Group on Securing Artificial Intelligence (ISG SAI) [8] This Industry specification group of the European Telecommunications Standards Institute (ETSI) develops technical specifications and reports to address 3 aspects of artificial intelligence in standards - securing AI from attack as a component in a system, mitigating against malicious AI, and using AI to enhance security measures. The ETSI ISG SAI develops the technical knowledge that acts as a baseline in ensuring that artificial intelligence is secure. Stakeholders impacted by the activity of ETSI's group include end users, manufacturers, operators and governments. One of the standards produced by the group is ETSI GR SAI 007, [9] addressing the explicability and transparency of AI processing.

IEEE P2976 [10] is a standard under development by IEEE that aims at the explainability of AI systems. The standard is titled " eXplainable Artificial Intelligence - for Achieving Clarity and Interoperability of AI Systems Design" and it is being developed by the IEEE P7006 working group on Standard for Personal Data Artificial Intelligence (AI) Agent and its Data Transactions. This standard defines mandatory and optional requirements and constraints that need to be satisfied for an AI method, algorithm, application or system to be recognized as explainable. Both partially explainable and fully or strongly explainable methods, algorithms and systems are defined, as well as the XML Schema. IEEE P2976 is still in development, and the expected date of submission of the draft to the IEEE SA for the Initial Standards Association Ballot is in January 2024.

NISTIR 8312 [11] is a publication from the National Institute of Standards and Technology (NIST), a government agency in the United States that is involved in developing standards and guidelines for various industries, including AI. NISTIR 8312 provides guidance on explainable artificial intelligence (XAI). The report is titled "An Introduction to Explainable Artificial Intelligence (XAI) and Related Standards," and it was released in 2019. The purpose of NISTIR 8312 is to provide an overview of XAI and related standards, as well as to identify gaps and challenges in current XAI research and development. The report defines XAI and explains why it is important for AI systems to be explainable. It then provides an overview of the different approaches to XAI, including model-specific approaches, post hoc approaches, and hybrid approaches. The publication also discusses the role of standards in promoting XAI and provides an overview of relevant standards and initiatives, including IEEE P7003, IEEE P7006, ISO/IEC 23894, and the Partnership on AI. It identifies gaps and challenges in current XAI research and development, including the need for more research on the effectiveness of different XAI approaches and the need for more collaboration between the XAI and machine learning communities. This report highlights the importance of transparency, accountability, and

ethical considerations in the development of AI technologies, and provides a roadmap for the development of more explainable and trustworthy AI systems.

The Royal Society's policy briefing on explainable AI [12] is a publication that guides the development and deployment of AI systems that are transparent, explainable, and trustworthy. The publication was released in November 2019. The briefing defines explainable AI and provides an overview of the related state of the art at the moment of issuing the briefing. It then provides an overview of the different approaches to explainability, and different needs for explanation forms in different contexts. The briefing also discusses the challenges and downsides of explainable AI and it provides an outline of the policy environment for explainable AI, including regulations and data protection law, emerging policies, and codes of conduct and ethical design.

Another valuable resource on the materials related to the standards in the field of AI is **Report of TWG AI: Landscape of AI Standards** [13], a document that represents an open access database of specifications, reviews and guidelines related to different aspects of Artificial Intelligence, including explainability and trustworthiness.

The stated initiatives and standardisation activities aim to support the development of AI explainability by providing common frameworks, tools, and standards that enable transparency, interpretability, and accountability of AI systems. The development of these standards is an ongoing process, and more initiatives are likely to emerge in the future as the field continues to evolve, hence this section will be updated throughout the duration of the project.

5.4.2 STANDARDISATION AND LEGISLATION ACTIVITIES IN THE FIELD OF OPEN DATA SPACES AND DATA SHARING

The European data strategy [14] was launched in February 2020 by the European Commission as part of the broader Digital Single Market initiative. The strategy aims to create a single market for data in the EU, where data can flow freely within the EU and across sectors and borders while ensuring data privacy and security.

To support the data strategy, the European Commission has proposed several legislative and non-legislative initiatives, including:

- **The Data Governance Act** [15]: The Data Governance Act proposal sets out rules and conditions for data sharing across the EU, and aims to create a more competitive and innovative data economy. It also establishes a European Data Innovation Board to advise on the development and implementation of the data strategy.

- **The Digital Services Act and Digital Markets Act** [16]: The stated legislative proposals aim to regulate digital platforms and online marketplaces to ensure that they respect consumers' rights and promote innovation while addressing issues such as illegal content and unfair competition, while ensuring safe, fair, open and accountable digital services.

- **The General Data Protection Regulation (GDPR**) [17]: This regulation, which came into effect in May 2018, sets out rules for the protection of personal data within the EU. The GDPR applies to all companies operating in the EU, regardless of their location, and imposes strict penalties for non-compliance. The GDPR sets data protection principles that enable lawfulness, fairness and transparency while facilitating the principles of accountability and data security.

- **The European Cloud Initiative** [18]: This initiative aims to create a trusted and secure cloud infrastructure for public and private data in the EU, and to promote the uptake of cloud services among businesses and public administrations.

- **The European High-Performance Computing Joint Undertaking** [19]: This initiative was started in 2018 between the EU, European countries and private partners and it aims to establish a world-class supercomputing infrastructure in the EU to support research, innovation, and digital transformation.

The stated examples of legislative and non-legislative initiatives are part of the European data strategy. The EU is continuing to work on developing the legal and regulatory frameworks to support the creation of a single market for data and to ensure that data is used responsibly and ethically. Alongside the legislative actions, the European Commission has launched several standardisation initiatives to support the European data strategy, we state the prominent ones:

- **European Interoperability Framework (EIF)** [20]: The EIF provides a common framework for the interoperability of public services in Europe. It defines a set of principles, guidelines and standards that ensure that public services can work together across national borders and sectors. It offers guidance on how to set up interoperable digital public services. The EIF provides 47 recommendations, which are organised around three main pillars: the 12 principles that should guide policy-makers in their pursuit of interoperability, the interoperability layers (semantic, technical, legal, etc.) presenting different aspects of interoperability that should be addressed in the design of European public services, and the conceptual model which aims at designing and delivering integrated public services.

- **European Interoperability Reference Architecture (EIRA)** [21**]**: The EIRA provides a high-level architecture content metamodel for defining the architectural building blocks needed to build interoperable public services in Europe. It defines a common vocabulary, data models and architecture building blocks that support the creation of interoperable and reusable services.

- **European Data Portal (EDP)** [22]: The EDP is a central platform for the discovery and reuse of open data in Europe. It provides a single access point to a wide range of data sets from across Europe and supports the

development of data-driven applications and services. It aims to facilitate data sharing and exchange of data across different domains and sectors. It provides a common framework for data interoperability, data mapping, and data exchange based on agreed standards and best practices.

- **The European Data Spaces (EDS)** [23] initiative aims at creating a secure and trusted environment for data sharing and exchange across different sectors and domains. The EDS is part of the EU's broader digital single market strategy, which aims to create a seamless and integrated digital economy across Europe. The European data strategy of February 2020 announced the creation of data spaces in 10 strategic fields: health, agriculture, manufacturing, energy, mobility, financial, public administration, skills, the European Open Science Cloud and the crosscutting key priority of meeting the Green Deal objectives. The EDS initiative builds on several existing EU initiatives related to data governance, including GDPR and the European Open Science Cloud (EOSC). Its goal is to enable cross-sectoral data sharing and collaboration while ensuring data privacy, security, and ethical use. The EDS initiative is being developed in collaboration with stakeholders from different sectors, including industry, academia, research, and civil society. It focuses on key priorities such as data interoperability, data sovereignty, data protection, and data governance. The EDS aims to create a common set of standards and guidelines for data sharing that can be applied across different domains and sectors while respecting the diversity of national and regional data ecosystems.

DIN SPEC 27070 [24] is a standard developed by the German Institute for Standardisation(Deutsches Institute fuer Normung, DIN) for the protection of personal data in cloud computing. It was published in February 2020 and provides a framework for data protection and security requirements that should be met by a security gateway for data exchange, taking into account the gateway architecture and cybersecurity measures.

The standard includes guidelines and recommendations for the implementation of technical and organizational measures to ensure the security and privacy of personal data in cloud computing environments. It covers various aspects of data protection, including data access and control, data storage, data processing, and data transfer. The International Data Spaces (IDS) connector is specified as a security gateway for the data exchange, according to the defined IDS certification scheme. In addition to gateway implementation principles, different levels of security are defined, which enables additional security features of the IDS connector. DIN SPEC 27070 states that it is the first initiative to specify requirements regarding a secure gateway for cross-company data exchange in the manufacturing industry. The aim of the developing team is for the DIN SPEC 27070 to become an international standard.

The stated initiatives aim to support the development of European data spaces by providing common frameworks, tools, and standards that enable interoperability and data exchange across different sectors and domains. The European Commission is continuing to work on developing and implementing further standardisation initiatives to support the European data strategy. While the focus of the initial part of the research regarding the initiatives and standardisation activities related to the open data spaces and data sharing presented in this document is focused on Europe, we plan to extend it to the global initiatives and general field of data interoperability and privacy enhancing computations in data spaces in the research activities following until the M18.

Finally, information on standards and guidelines used in TRUSTEE's ABBs and pilots identified by the standardisation survey conducted among TRUSTEE consortium is presented in section "Standards and guidelines used in TRUSTEE".

5.5 TRUSTEE STANDARDISATION SURVEY

This section brings an overview of the TRUSTEE standardisation survey objectives and results, as well as the details on how it was conducted.

5.5.1 SURVEY OBJECTIVES

The TRUSTEE standardisation survey was conducted to address several goals for Phase 2 of the standardisation plan. The main objectives of the TRUSTEE standardisation survey were to:

- evaluate the experience of TRUSTEE partners in the field of standardisation
- evaluate interest in participating in the standardisation activities among partners
- assess the interest of the partners for various standardisation areas relevant to TRUSTEE
- gather comprehensive information on the existing standards being used in the TRUSTEE platform and pilots
- gather information on the identified standardisation gaps

5.5.2 SURVEY INFORMATION

The survey questions were formed based on the previously stated objectives. The survey consisted of 15 questions which are available in Annex A. Most of the questions were open, enabling the participants to describe their experience within the field of standardisation, state the identified standardisation gaps related to TRUSTEE, express their interest in various standardisation topics relevant for TRUSTEE, and provide information on the existing standards they are using in the implementation of TRUSTEE platform or pilots. In the question where we ask partners to select the topics of standardisation activities they are most interested to work on, we chose the set of priority topics based on the EU Strategy on Standardisation [26] that were relevant for TRUSTEE.

Since our goal was to cover various aspects of the project and to gain comprehensive feedback regarding standardisation activities, we asked all partners to participate in the survey. Multiple individuals per partner could participate in filling out the survey, but they were instructed to combine their answers in a single response per partner.

The survey was conducted from April 28th to May 16th 2023, and within that period of time we collected inputs from 16 partners. The responses were analysed and the results are summarized in the section below.

5.5.3 RESPONSE ANALYSIS

The first objective of the survey was to gain insight into the previous experience partners have in the field of standardisation and what kind of experience do they have (e.g., which topics, standardisation organisations, technical

committees, etc. have they been involved with previously). According to the responses, 62,5% of the partners who participated in the survey have previously been involved in standardisation activities, with a minority of 37,5% of participating partners not having any previous experience at the time (Figure 18).

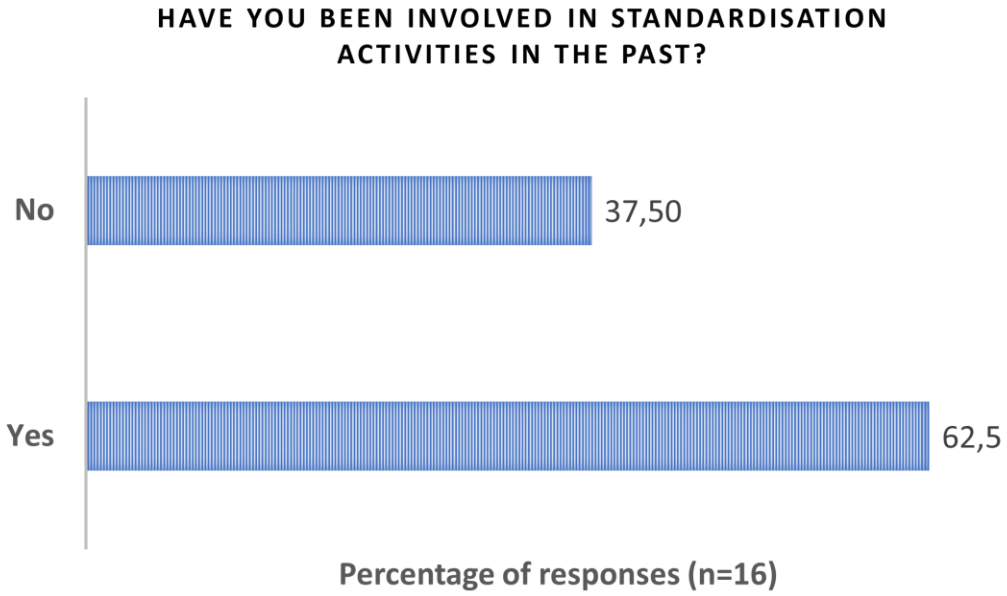

Figure 18: Percentage of partners with previous standardisation experience

The participants were asked to briefly describe their experiences, if they had any. The responses varied in terms of involvement in different standardisation topics and organisations. The mentioned areas of standardisation that the members of the consortium have experience with include:

- Public safety
- Image quality metrics
- Education cybersecurity
- Telecommunication services and cybersecurity insurance
- Orchestration of Network functions virtualization (NFV) services
- Sensing, automotive safety and automotive security
- Face recognition systems in healthcare
- Standardisation of medical procedures
- Sustainable energy
- Materials technology
- Obtaining consent for the use of personal health information
- Legal interoperability within and between data spaces
- Cybersecurity and personal data protection
- Cybersecurity management systems

- Cryptography and security mechanisms
- Data protection, privacy and identity management
- Enabling digital technologies
- Blockchain and distributed ledger technologies

The stated experience of the consortium members included involvement with the following standardisation organisations, working groups, technical committees and standardisation landscape participants:

- ETSI Emergency Telecommunications (EMTEL) Technical Committee
- The European Union Agency for Cybersecurity (ENISA)
- The Institute of Electrical and Electronics Engineers (IEEE)
- IEEE Future Networks
- IEEE Standardisation P1994 Committee
- IEEE Public Safety Initiative
- IEEE p2020 Automotive Image Quality Working Group
- Student Data Privacy Consortium (SDPC)
- European Telecommunications Standards Institute (ETSI)
- ETSI NFV ISG
- International Organization for Standardisation (ISO)
- Association of the Automotive Industry (VDA)
- European Committee for Standardisation (CEN)
- DIN (German Institute for Standardisation)
- The International Data Spaces Association (IDSA)
- Spanish Association for Standardisation (UNE)

The participants were asked if they are interested in the development of standards and participating in the standardisation activities. 75% of the project partners who participated in the survey expressed their interest in working on a standard development (Figure 19). Taking into account that the majority of the survey participants would like to participate in standardisation activities, and the various standardisation organisations and topics the members of the consortium have been involved with in terms of standardisation, we have concluded that this result demonstrated a solid base for forming a standardisation work group among the project's consortium.

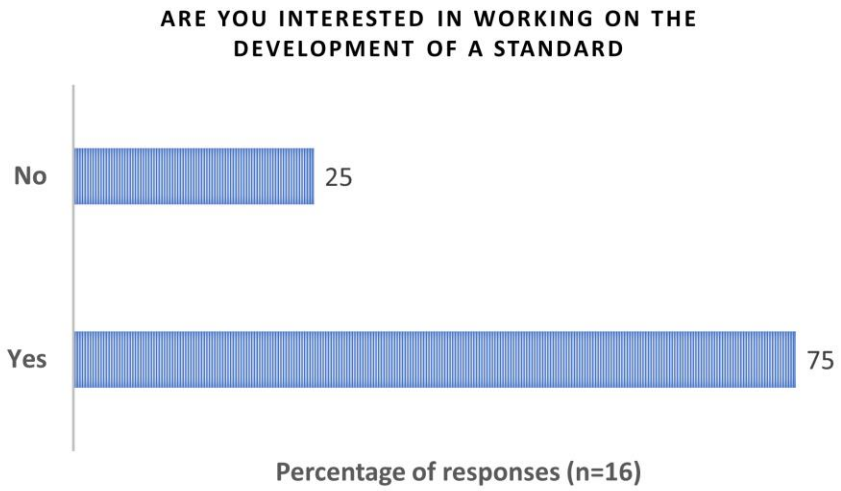

Figure 19. Percentage of partners interested in working on standardisation activities

Next, to assess the interest of partners for specific standardisation topics, we provided a list of priority topics based on the EU Strategy on Standardisation[3] that were relevant for TRUSTEE and asked the participants to mark the topics on which they would like to work on (Figure 20).

[3] https://hsbooster.eu/news/eu-strategy-standardisation

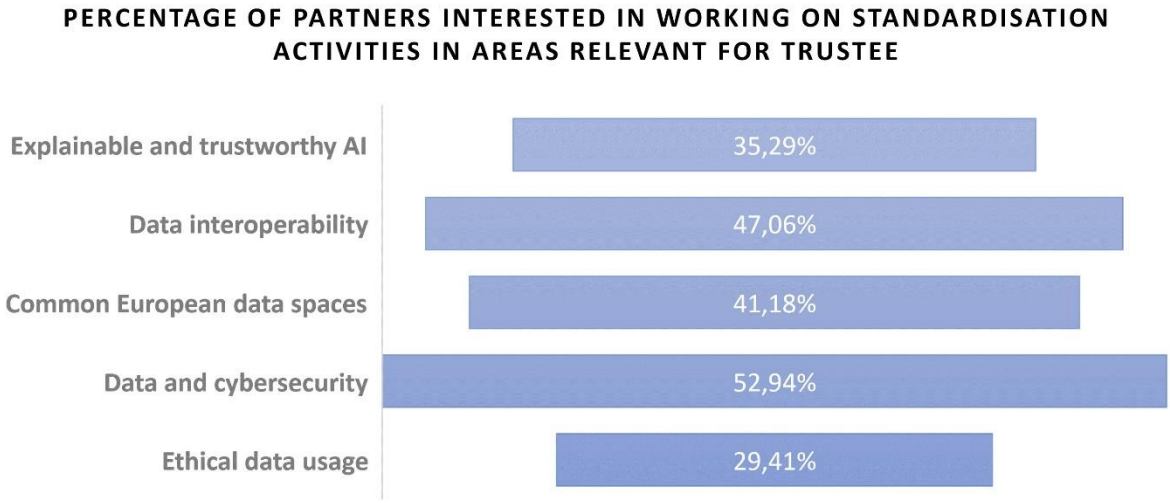

Figure 20. Percentage of partners interested in working on specific standardisation topics

The most interesting topic for the survey participants who expressed their willingness to work on standardisation activities was "Data and cybersecurity" with 52,94% of participants who stated their interest in this topic, followed by "Data interoperability" (47,06%) and "Common European data spaces" (41,18%). Fewer partners were interested in topics "Explainable and trustworthy AI" (35,29%) and "Ethical data usage" (29,41%). At the time of conducting the survey, we were already planning to apply for Horizon Standardisation Boosters'(HSB) support, described in more detail in the next section, so the outcomes of the survey were also useful for indicating the consortium's interest in TRUSTEE's application.

Finally, another objective of the standardisation survey was to collect information on the existing standards used in the TRUSTEE platform and pilots. We documented the reported standards in the next section "Standards used in TRUSTEE".

5.6 STANDARDS AND GUIDELINES USED IN TRUSTEE

In order to evaluate TRUSTEE's compliance with the existing standards in the standardisation landscape, we gathered the information on standards used within TRUSTEE project. This section contains information about standards used in TRUSTEE platform and pilots. Since there are many partners involved in the implementation of the TRUSTEE ABBs and leading the TRUSTEE pilots, we have gathered the information on used standards via the TRUSTEE standardisation survey. The standards reported through the survey are described below alongside their usage in TRUSTEE. We plan on evaluating the used standards in an additional iteration as the implementation of various aspects of the project will progress in the following reporting period.

The Open Group Architecture Framework (TOGAF) [25]

The TOGAF standard is an architectural framework that provides methods and tools for developing, using, and maintaining enterprise architectures. The framework defines an iterative process model that includes best practices and a re-usable set of existing architecture assets. TOGAF standard supports several architecture domains, originating from a general Enterprise Architecture including business, data, application and technology architecture domains. In addition to the method of developing an enterprise architecture, TOGAF provides an approach for defining components of architectures in the mentioned domains and offers architecture reference models.

The framework defines several categories of the products that are usually produced and worked with in terms of designing and implementing enterprise architectures. One such concept that the TRUSTEE project heavily used in the planning and designing phase is the concept of architecture building blocks (ABBs), which is described in more detail in the context of TRUSTEE architecture definition and implementation in the deliverable D2.1.

The JSON Data Interchange Format

JSON (ECMA-404, ISO/IEC 21778:2017) is an open standard file format and a text-based, language-independent syntax for defining data interchange formats. JSON defines a small set of structuring rules for the portable representation of structured data. The goal of ISO/IEC 21778:2017 [26] is to define the syntax of valid JSON texts, however it does not provide any semantics or interpretation of text conforming to that syntax. Within TRUSTEE, JSON is used for communication and data interchange among architectural building blocks.

OpenAPI Specification

OpenAPI specification [27] is a specification for a machine-readable interface definition language for describing, producing, consuming and visualizing web services. Within TRUSTEE it is used for intercomponent communication.

5.6.1.1 STANDARDS AND GUIDELINES RELATED TO THE TRUSTWORTHY AI

As identified by the leader of the Trustworthy AI Support Design Framework ABB, the following set of the standards were identified as applicable to the solution within the scope of T3.3:

- Ethics Guidelines For Trustworthy AI[4]
- CNIL, Self-assessment guide for AI systems[5]

[4] https://digital-strategy.ec.europa.eu/en/library/ethics-guidelines-trustworthy-ai

[5] https://www.dataguidance.com/news/france-cnil-publishes-gdpr-compliance-guide-and-self

- AEPD, "GDPR compliance of processing that embed Artificial Intelligence An introduction"[6]
- AEPD, "Audit Requirements for Personal Data Processing Activities involving AI"[7]
- UK ICO, "Guidance on AI and data protection, 2.0", March 2023[8]
- UK, Department for Science, Innovation & Technology, "A pro-innovation approach to AI regulation", March 2023[9]
- The OECD Artificial Intelligence (AI) Principles - OECD.AI, included in the Recommendation of the Council on AI: OECD Legal Instruments[10]

5.6.1.2 STANDARDS AND GUIDELINES USED IN THE TRUSTEE AUTOMOTIVE PILOT

As identified by the pilot leader, the following standards are applied in the implementation of the TRUSTEE automotive pilot:

- **ISO 26262:** regulating the hardware safety related issues and the SPICE (Software Process Improvement Capability dEtermination).[11]
- **ASPICE:** (Automotive Software Process Improvement Capability dEtermination) is an industry-standard guideline for evaluating software development processes.[12]
- **IEEE-SA P2020:** Automotive Imaging Standard: Addresses the considerable ambiguity in measurement of image quality of automotive imaging systems, both human and computer vision based.[13]
- **ADASIS:** The purpose of ADASIS is to make map data available to various ADAS and AD applications distributed over a vehicle's systems. The standard is developed and maintained in order to define and promote the standardized ADASIS interface.[14]

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[6] https://www.aepd.es/es/documento/adecuacion-rgpd-ia-en.pdf

[7] https://www.aepd.es/en/node/45495

[8]https://ico.org.uk/media/for-organisations/guide-to-data-protection/key-dp-themes/guidance-on-ai-and-data-protection-2-0.pdf

[9]https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1146542/a_pro-innovation_approach_to_AI_regulation.pdf

[10] https://oecd.ai/ai-principles

[11] https://www.iso.org/standard/68383.html

[12] https://www.aptiv.com/en/insights/article/what-is-aspice

[13] https://standards.ieee.org/ieee-whitepaper/ieee-p2020-automotive-imaging/

[14] https://adasis.org/

- **SENSORIS:** Global Standardized interface to exchange information between in-vehicle sensors and a dedicated cloud, as well as between clouds.[15]
- **ISO/SAE 21434**: standard for cyber security in automotive[16].

This section will be expanded as more information about used standards, guidelines and legislations used in TRUSTEE ABBs and pilots will be gathered in the following months as the project progresses.

5.7 HORIZON STANDARDISATION BOOSTER APPLICATION

Horizon Standardisation Booster (HSB)[17] is a Coordination and Support Action funded by the European Commission that offers support for Horizon 2020 and Horizon Europe projects in terms of standardisation activities and facilitates dialogue between projects and standards developing organisations. The current open call is running until the end of the year 2023. The projects applying for HSB's support have to meet eligibility criteria and their application is evaluated based on their involvement with identified standardisation priority topics. Projects applying for the support of the HSB may request support in terms of understanding the basics of standardisation, choosing the appropriate type of standardisation for the project, selecting the relevant standardisation organisations to engage with, how to identify needs for new standards, and how to get engaged in standardisation activities, etc.

Since the TRUSTEE standardisation survey was conducted previous to the project's HSB application, we have identified the standardisation topics of most interest among the TRUSTEE consortium and chose the appropriate topics from the priority topic list identified by the HSB. The preliminarly version of TRUSTEE's application was prepared and itis available in Annex B of this deliverable. Since we will continue the review of existing standards in the field of privacy enhancing computations in data spaces in the following months, and will additionally work towards identifying opportunities for standardisation in accordance with the project results, we plan on finalizing and submitting the application in early Y2. Hence the outcome of the HSB application will be reported in the following version of this deliverable.

6 CONCLUSION AND NEXT STEPS

In conclusion, this deliverable has provided a comprehensive account of the dissemination, standardisation, and communication activities undertaken by the TRUSTEE project during its first year. Our plan for disseminating TRUSTEE's findings, which is based on the project's major achievents and enhanced by the netwroks of each partner,

[15] https://sensoris.org/

[16] https://www.iso.org/standard/70918.html

[17] https://www.hsbooster.eu/

outlines how and where TRUSTEE will share its findings. This ensures that the project will deliver measurable benefits to the identified stakeholders.

As highlighted above, the project's communication and dissemination KPIs have been met with success, and during the second year of TRUSTEE we will seek to engage more stakeholders. The communication plan that has been reported on D6.3 "Communication and Dissemination Strategy and Plan" has been effectively implemented, to ensure that the project's objectives will be met. Milestones have been reached (e.g. Website, Social Media Presents, Participation in Events and Conferences, Publications and Workshop Organisation). During the next months, we will enhace the project's presence on our social media channels (especially YouTube) and we will attend more conferences that may add to the project's visibility.

To pursue the standardisation objectives of the project, a standardisation plan has been defined for TRUSTEE standardisation activities. Within the first year of the project, we have focused on activities in phases 1 and 2 of the proposed plan, and have initiated phase 3 by preparing an application for the HSB support in order to facilitate the relevant collaborations with the standardisation organisations. We have provided an overview of the initial existing standards, initiatives and recommendations related to the topics relevant to TRUSTEE. As we continue to work on further expanding the review, we are identifying the lack of standards in areas relevant to the TRUSTEE project, such as explainable and trustworthy AI, data interoperability, common European data spaces, and data and cybersecurity. We have conducted the TRUSTEE standardisation survey to gather comprehensive information on the standards currently used in the development of TRUSTEE architecture, architectural building blocks and pilots, and to evaluate experience and interests in the field of standardisation among the TRUSTEE consortium. The standardisation survey results have also been used to prepare the project's application for HSB.

The next steps for the standardisation activities will include additional research on the existing standardisation landscape and preparing the engagement of TRUSTEE with the standardisation landscape based on the standardisation survey results and the outcomes of the HSB application.

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ANNEX A: TRUSTEE STANDARDISATION SURVEY QUESTIONS

Survey – TRUSTEE Standardisation activities (T6.5)

The purpose of this survey is to gain insight into previous involvement and experience in standardisation among TRUSTEE partners, as well as to assess partners' interest in participating in future standardisation activities.

Since standardisation plays an important role in efficient product development and market acceptance, we pay special attention to the standards already used in pilots and TRUSTEE platform development. In addition to the existing standards, we aim to evaluate current standardisation gaps and the possibility of contributing to ongoing or future standardisation initiatives relevant to the TRUSTEE project.

Most of the survey questions are open-ended so you can directly type in your answer. In case of multiple-choice questions, please mark your answer by clicking on the checkbox next to it.

1. Contact person:

(Survey can be filled out by multiple individuals per partner. We are asking for names just so that we can contact you directly in case we need more details or clarification of the response.)

2. TRUSTEE partner affiliation:

3. Have you or any other member of your institution working on the TRUSTEE project been involved in standardisation activities in the past?

4. If yes, please provide a brief explanation of the activity and which standardisation bodies have you been involved with.

5. Are there any ongoing standardisation activities in your institution?

☐ Yes
☐ No
☐ I don't know

6. If yes, please briefly describe which ones.

7. Are you interested in working on the development of a standard?

☐ Yes
☐ No

8. If yes, which area of standardisation are you most interested in? Are you aware of existing standards development organizations, technical committees or working groups you would like to engage with?

9. Please mark all of the areas below that you as a TRUSTEE project partner would like to contribute to the standardisation of:

☐ Explainable and trustworthy AI
☐ Data interoperability
☐ Common European data spaces
☐ Data and cybersecurity
☐ Ethical data usage

10. Is there any other area related to TRUSTEE you would be interested in contributing to in terms of standardisation?

11. Are you aware of a specific topic related to TRUSTEE where standards are missing? If you have identified standardisation gaps, please provide a short description. If there is a clear relation between the identified gap and a particular TRUSTEE task, please mention it.

12. If you are involved in TRUSTEE ABB (Architecture Building Block) implementation, are you aware of any standards applied (or planned to be applied) in the realisation of the ABB you are building? If yes, which ones? Please also state the ABB you are working on.

13. If you are a TRUSTEE pilot leader, are you aware of any standards used in the pilot you are leading (e.g., standards specific for the automotive industry, healthcare, etc.)? If yes, which ones?

14. If you are working with a standard within your activities in TRUSTEE not being covered by the previous two questions, please provide a brief description of the used standard and the activity (in terms of TRUSTEE WPs and tasks).

15. Do you have any comments or information related to the standardisation activities you would like to share that are not covered by the questions in this survey?

Thank you for providing your input and participating in the TRUSTEE standardisation survey.

ANNEX B: TRUSTEE HORIZON STANDARDISATION BOOSTER APPLICATION

This annex contains TRUSTEE's application for Horizon Standardisation Booster in its initial version, prepared within Y1 of the project. We are planning on finalizing the application in the upcoming months as we will further investigate opportunities for standardisation based on the TRUSTEE's results produced so far.

TRUSTEE's responses to the application form questions are provided below, marked in red.

About your project

Grants Agreement Number: 101070214

Project acronym: TRUSTEE

Full project name: TRUST AND PRIVACY PRESERVING COMPUTING PLATFORM FOR CROSS-BORDER FEDERATION OF DATA

Funding programme: Horizon Europe

Please indicate the Call Topic ID: HORIZON-CL4-2021-DATA-01

Project Website: https://horizon-trustee.eu/

Project officer name: Stefano Bertolo

We will contact your PO to let them know you have applied for an HSbooster.eu service

Open call topic

Please indicate a maximum of three open call topics for which you could provide expert advice on standardisation to EC projects

MAX 3 OPTIONS. You can select one or multiple fields. (For multiple fields use ctrl+click / command+click)

- Select a value-

Health
-Pandemics
--COVID-19 vaccines: Needle-free and needle based-injection systems for medical use
--COVID-19 vaccines: Aseptic processing
--Medicine production
--Respiratory equipment

--Pandemic preparedness and resilience
--Tests and measurement methods for SARS/COV19: Pathogens
--Tests and measurement methods for SARS/COV19: Wastewater
--Epidemiology: Risk, population, genetic

-E-Health and personalised services

--Accessibility
--Assisted living
--Cybersecurity in healthcare
--Digital healthcare
--eHealth
--Mobile applications
--Personal medicine

-Design and use of medical device

--5G for live consultations and remote surgery
--Biotechnology (organ-on-chip)
--Design for disassembly
--Patient safety
--Reliability of medical devices (for emergency use)

-AI in Healthcare

--AI health services
--AI in radiology
--Synthetic data

Resilience

-Robust supply chains

--Business continuity
--Energy and natural gas distribution
--Risk management
--Transport and infrastructure (roads, rails, telecommunications, energy etc)
--Workforce changes and demands

-Climate resilience

--Biodiversity
--Climate adaptation
--Climate monitoring
--Geotextiles

-Hybrid civil/defence

--Civil crisis preparation
--Emergency management

-Data protection and cybersecurity

--Cyber resilience
--Information security for SMEs
--IT security
--Payment services

Sustainable digitalization

-Data quality and Artificial Intelligence
--AI-based decision-making solutions (HR, legislation, labour)
--Circular data
--Data interoperability
--Ethical data usage
--Intelligent factories
--Trustworthy AI
-Access to and usage of data
--Blockchain and digital logbook
--Circular data
--Common European data spaces
--Data interoperability
--Digital twins
--eGovernment
--eID
--Ethical data usage
--Internet of things
--Internet protocols
-Space
--5G from space
--Big data from space
--European Global Navigation Satellite System (EGNSS)
-Data and cybersecurity – potentially (HE)
--Audit and certification of information security
--Chips in terms of security, authenticity, reliability
--Cloud Services
--Cyber security in telecommunication
--Cyber- and information security (SME)
--Identity management
--Payment services
-Quantum technology
--Quantum communication
--Quantum computing
--Quantum sensors
--Quantum simulations
Green transition in Europe
-Clean energy
--Clean hydrogen infrastructure
--Clean hydrogen value chain
--Documentation of green fuels
--Energy storage
--fueling and refueling of green fuels
--Gas transportation (incl. hydrogen)

--Smart energy
--Wind turbines
-Materials (raw and secondary)
--Critical raw materials for batteries and waste batteries
--Plastic recycling incl. textiles
--Recycling of critical raw materials (CRM)
--Recycling/reuse of electrical components (WEEE directive)
-Green and sustainable production
--Sustainable product initiative
--Product passport
--Product environmental footprint
--Material passport
--Additive and on demand manufacturing (3d print etc.)
--Eco design
-Environmental impact
--Carbon capture, utilisation, storage (CCUS)
--Toxic-free environment
Smart Cities and Circular Economy in Buildings
-Circular economy in the construction sector
--Embedded carbon
--Design for circularity
--Design for disassembly
--Low-carbon cement
--Material and product pass
--Non-destructive testing
--Selective demolition-Transportation
--Connected cars
--Green transportation
-Infrastructure
--Postal service
--Critical infrastructure incl. pipes etc.
--Intelligent transportation systems
--Interconnected city
-Green buildings
--Intelligent buildings
--Indicators for circular buildings

About the support your project requires

Please tell us about the type of information or activity that you and your project would like to attain from this application:

- Select a value –

Understand the basics on standardisation including basic terms
How to choose appropriate types of standardisation for an R&I project
How to select relevant Standardisation Organisations to engage with
How to get engaged in standardisation as an observer or participant
How to influence processes and outcomes of standardisation
How to identify needs for new standards
How to propose new standardisation items to a Technical Committee
Information on the standardisation landscape in a certain technical field
How to search for and select appropriate standards
Understand relations between standards and regulations

Please provide a short description of your project and its standardisation objectives:

TRUSTEE project aims to bring a secure, trustworthy, and privacy-aware framework that aggregates various interdisciplinary data repositories (healthcare, education, energy, space, automotive, cross-border, etc.) and also consider other European data federation spaces and trans-national initiatives, such as Gaia-X and EOSC. TRUSTEE's goal is to offer a secure-by-design framework, wherein stored data is homomorphically encrypted, thus offering researchers ability to search and use data in the encrypted domain, a unified and meaningful representation of data in an open and fair manner, as well as data processing and analysis through transparent trustworthy machine learning workflows. TRUSTEE will promote AI explainability, interoperability, and re-usability, by utilizing state of the art methods and paradigms, compliance with European privacy and ethical frameworks, enforcing privacy by applying a Homomorphic encryption layer, through which all data interaction will take place, and a blockchain-based transaction recorder to ensure accountability. TRUSTEE's fully encrypted solution will be validated through six different use cases supporting GAIA-X, EOSC, EGI, etc. demonstrating a multi-disciplinary, Pan-European federated FAIR and private data ecosystem. The standardisation objectives of TRUSTEE are focused on contributing to the standardisation landscape with the focus on areas relevant to the project, including: trustworthy and explainable AI, data interoperability, common European Data spaces, and data and cybersecurity.

Please tell us why you are applying for a Standardisation Booster service.

Please tell us in as much detail how the booster services can best help your project achieve its standards-related goals

We are applying for a Standardisation Booster service since TRUSTEE aims at contributing to the current standardisation landscape in areas relevant for the project's scope, including: trustworthy and explainable AI, data interoperability, and common European data spaces. We have performed an initial analysis of standardisation activities in the stated areas and noticed the lack of existing standards. Also, all of the mentioned standardisation topics are identified as priority topics of the current Horizon Standardisation Booster call, which we percieve encouraging in terms of TRUSTEE's contribution to the standardisation landscape. We are seeking support in terms of guidance on choosing the appropriate type of standardisation for TRUSTEE to involve in, as well as the Standardisation Organisations to engage with. We would also like to receive advice on how to approach the Standardisation Organisation of interest and get engaged in standardisation activities.

Which standards are you targeting?

Do you know which standards or Technical Committee/Sub-committee/Working Groups you would like to engage with?

No

Yes

Standards

Please indicate a maximum of three open call topics for which are related to the standardisation activities you are seeking support on. (To add more than one topic use ctrl+click / command+click)

Public profile publication

Can we publish your profile in HSBooster.eu website?

No

Yes

We'd like to create public profiles on the projects and experts which apply for HSbooster.eu services, see some examples here https://hsbooster.eu/project-hub or here https://hsbooster.eu/pool-of-experts .

This will give your project/profile visibility as being active in the standardisation area.

Click yes let us publish information about your project/profile on our website.

The Members of the TRUSTEE Consortium:

Short Name	Legal Name	Country
FORTH	IDRYMA TECHNOLOGIAS KAI EREVNAS	EL
HMU	ELLINIKO MESOGEIAKO PANEPISTIMIO	EL
PASEU	PANASONIC AUTOMOTIVE SYSTEMS EUROPE GMBH	DE
UNIVIE	UNIVERSITAT WIEN	AT
K3Y	K3Y	BG
ACCELIGENC LTD	ACCELIGENCE LTD	CY
UCSC	UNIVERSITA CATTOLICA DEL SACRO CUORE	IT
ENT	ERICSSON NIKOLA TESLA D.D.	HR
ADRESTIA	ADRESTIA EREVNITIKI IDIOTIKI KEFALAIOUXIKI ETAIREIA	EL
TECNALIA	FUNDACION TECNALIA RESEARCH & INNOVATION	ES
RINA-C	RINA CONSULTING SPA	IT
ZORTENET	ZORTENET IDIOTIKI KEFALAIOUXIKI ETAIREIA	EL
IQB	INQBIT INNOVATIONS SRL	RO

VTT	TEKNOLOGIAN TUTKIMUSKESKUS VTT OY	FI
FUJITSU	FUJITSU TECHNOLOGY SOLUTIONS (LUXEMBOURG) SA	LU
HPE	HEWLETT PACKARD ITALIANA SRL	IT
HPE-CDS	HEWLETT-PACKARD CUSTOMER DELIVERY SERVICES ITALIA SRL	IT
ISS	INSTITUTUL DE STIINTE SPATIALE	RO
CHECKWATT AB	CHECKWATT AB	SE
ATHENA	ATHINA-EREVNITIKO KENTRO KAINOTOMIAS STIS TECHNOLOGIES TIS PLIROFORIAS, TON EPIKOINONION KAI TIS GNOSIS	EL
EPL	ETOILE PARTNERS LTD	UK
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