

Engage 2 Data Management Plan

Deliverable ID:	D1.2
Project acronym:	Engage 2
Grant:	101114648
Call:	HORIZON-SESAR-2022-DES-ER-01
Topic:	HORIZON-SESAR-2022-DES-ER-01-WA3-1
Consortium coordinator:	Deep Blue srl
Edition date:	24 November 2023
Edition:	00.05
Status:	Third release
Classification:	PUB

Abstract

The Data Management Plan describes the data management life cycle for the data collected, processed and generated by the project. The Deliverable is the outcome of T1.2. The DMP will be updated over the course of the project whenever significant changes arise (e.g. new data or new regulation).



Authoring & approval

Date
23/08/2023
16/11/2023
25/09/2023
9/11/2023
25/09/2023
9/11/2023
9/11/2023

Reviewed by

Organisation name	Date
Serena Fabbrini, Deep Blue	26/09/2023
	23/11/2023

Approved for submission to the SESAR 3 JU by ¹		
Date		
28/09/2023		
24/11/2023		

Rejected by²

Organisation name	Date
SESAR 3 JU	23/10/2023



¹ Representatives of all the beneficiaries involved in the project

² Representatives of the beneficiaries involved in the project



Document history

Edition	Date	Status	Company author	Justification
00.00	23/08/2023	Draft	Micol Biscotto	First draft to be reviewed
00.01	25/09/2023	Contributions	Silva Kerkezian, Pablo Hernandez, Paula Lopez	Review from other partners
00.02	26/09/2023	Reviewed draft	Serena Fabbrini	Reviewed version including contributions from other partners
00.03	27/09/2023	Final version	Micol Biscotto	Final version including reviews/improvements
00.04	23/11/2023	Second release	Serena Fabbrini	Reviewed version including contributions from SESAR and other partners
				 p. 9: transfer of results to the new consortium's coordinator in case of follow-up
				 p. 10: data and research results generated through these funded activities will be subject to FAIR data approach
				 p. 11: mention to Article 17 and Annex 5 of the Grant Agreement, mention to ORE
				 p. 12: clarification on the storage of project presentation
				p. 12-13: section 2.2.3 edited accordingly
				 p. 17: clarification on trusted repositories
				 p. 21: Engage 2 data controllers new chapter
				Annex I added

EUROPEAN PARTNERSHIP



00.05	25/03/2024	Third release	Serena Fabbrini	Change of the dissemination level of the deliverable, from SEN to PUB as stated in the Grant Agreement.
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Engage 2

THE SESAR 3 KNOWLEDGE TRANSFER NETWORK

Engage 2

This document is part of a project that has received funding from the SESAR 3 Joint Undertaking under grant agreement No 101114648 under European Union's Horizon Europe research and innovation programme.







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List of acronyms

Acronym	Description
ATM	Air Traffic Management
CMS	Content Management System
D	Deliverable
DPO	Data Protection Officer
EC	European Commission
FAIR	Findable, Accessible, Interoperable, Reusable
GDPR	General Data Protection Regulation
KTN	Knowledge Transfer Network
OER	Open Educational Resources
ORE	Open Research Europe
OS	Open Science
PhD	Doctor of Philosophy
PIDs	Persistent Identifiers
SDA	SESAR Digital Academy
SEO	Search Engine Optimization
SIDs	SESAR Innovation Days
SRIA	SESAR's Strategic Research and Innovation Agenda, Digital European Sky
WP	Work Package

Table 1 List of acronyms







1 Data summary

1.1 Introduction to version 00.04 of Engage 2 DMP

In this updated version (00.04) of the Engage 2 DMP, we have addressed the comments provided by the SESAR reviewers. The Deep Blue (DBL) internal team specializing in data protection and management, has developed a new form, as outlined in Annex I. Each partner has filled this form to provide insights and perspectives. These contributions have been instrumental in refining this DMP, ensuring meets the expectations set forth by SESAR.

1.2 Project overview and objectives

Building on the successes of the Engage Knowledge Transfer Network (KTN), Engage 2 aims to train, inspire, and equip the next-generation aviation workforce for the digital era. Utilising innovative technologies and methodologies, Engage 2 will promote knowledge exchange, stimulate innovative research, and forge robust links between academia, industry, and policymakers. It will deliver value through its interactive knowledge hub, the Engage Wiki, dedicated funding mechanisms, and various networking and engagement activities.

Engage 2 also aims to foster a holistic view of the future of the ATM sector, investigating upcoming scenarios, skills requirements, and how to attract more students to the field. The ultimate goal is to contribute significantly to the future readiness of the ATM sector and to strengthen the wider aviation community in Europe.

Final aim of Engage 2 is to bridge the gap between industry and academia, by delivering cross-fertilisation of knowledge from other disciplines to stimulate inputs from innovative, future-scoping and unconventional research into the domain of ATM. A focal point here is the ATM concepts roadmap, which will be developed further as a core element of the Engage Wiki.

Engage 2 specifically aims to:

Objective 1. Support S3JU in the enhancement and implementation of SESAR Digital Academy (SDA) and in the preparation and execution of webinars and other events (including the SESAR Innovation Days - SIDs).

Objective 2. Enlarge the KNT and enlarge further industry and academia.

Objective 3. Further improve the Engage knowledge hub (Wiki) as a one-stop, go-to source for information in the ATM context.

Objective 4. Engage students and support them in identifying opportunities in ATM related studies.

Objective 5. Investigate the future of ATM including the needed skills and attract students to the ATM sector.

Objective 6. Promote triple-helix collaboration of academia, industry and policymakers towards common interests in the ATM field.







1.3 Re-use of existing data

As Engage 2 leverages on the results achieved by Engage KTN, the consortium will use as a starting point several achievements of the previous project. Data that will be re-use will be:

- 1. Engage Wiki, as the online platform developed as an accessible meta-source of research data. Engage Wiki has its own set of data and the main outcomes are described in one of Engage's legacy deliverables, D3.9 The Engage Wiki - an update on the KTN's knowledge hub functionality, research maps and repository³
- 2. Engage KTN website, that will be restyled and implemented according to the activities foreseen within Engage 2. The website has its own set of data, both technical (e.g. hosting and server information, domain names, CMS (Content Management System) login credentials) and related to SEO (Search Engine Optimization) (e.g. relevant keywords for the website, meta descriptions and page titles)
- 3. Data-driven analysis of SESAR projects in the repository of the Engage Wiki, to identify gaps in the existing research corpus, relative to the SESAR's Strategic Research and Innovation Agenda, Digital European Sky (SRIA).
- Other relevant projects results, e.g. outcomes of workshops, webinars, thematic challenges call and funded PhDs project. These data are available inside one of Engage legacy deliverables, D3.10 Research and innovation insights⁴.

1.4 Data generated within the project

Throughout the activities implemented in Engage 2, a substantial volume of data will be gathered from the diverse systems and entities involved, as illustrate in the following preliminary lists:

- **Research project metadata**. The project will collect and store detailed information about ongoing and completed research projects, including titles, descriptions, project leads, and start and end dates.
- **Participant data**. The project will gather data related to participants in Engage 2 activities, such as personal information, CVs, skills, and contributions to project activities.
- **Training activity data**. As the project involves training activities, it will generate data such as records of training sessions, educational materials, and participant feedback.
- Learning Data. As the project includes training and skills development activities, data on student progress, exam results, and educational materials may be generated.
- **Scientific publication data**. As the project produces scientific publications, data related to these publications will be generated, including titles, authors, abstracts, and citations.



³ D3.9 The Engage Wiki - an update on the KTN's knowledge hub functionality, research maps and repository, available on Engage KTN website.

⁴ D3.10 Research and innovation insights, <u>available on Engage KNT website</u>.



- **Project output data**. These data include research findings, technical reports, summary documents, and other project outcomes that can be made publicly available.
- **Evaluation and monitoring data**. The project will generate data related to evaluation and monitoring activities, such as questionnaires, interviews, and performance data.
- **Consortium activity data**. Information about project management, including financial data, activity timelines, and communications among consortium members.
- **Data management data**: Information about metadata, data repository management, and compliance with data management policies.
- **Collaboration Data**. Data related to interactions and collaborations among consortium members, such as shared documents, communications, and joint outcomes.

In case of funding of the follow up "Engage 3" and if the project will be awarded to a different consortium, the Engage 2 consortium is committed to a direct transfer of results to the new consortium's coordinator. This transfer includes:

- Providing full admin credentials to the SJU before the end of the Engage 2 project. The SJU will hold these credentials and transfer them to the awarded consortium at the appropriate time.
- The S3JU will inform Innaxis when these credentials are passed on to the new owner.
- All results, including deliverables, papers, project reports, and other materials hosted on the Wiki, will be compiled and delivered separately, enabling the new entity to host them on a different server. Note that the current servers, owned by Innaxis, will cease maintenance seven days following the Wiki transfer.
- Results stored in trusted repositories, admin credentials will also be provided, allowing for full maintenance and usage discretion of the new consortium.

Upon completion of this transfer, the new consortium will assume full responsibility for the Wiki's future updates and development. Former Engage consortium members will be able to contribute as standard, non-admin registered users, with the new consortium managing access and permissions as necessary.

1.5 The Origin of the Data

Throughout dedicated interviews, questionnaires, workshops, and board meetings, Engage 2 will collect mainly four types of data, listed in the table below.

Type of data	Tool(s) use to collect the data	Description
Data on	Literature review	The data coming from research projects will be used to
ongoing and		further implement the visual ATM concept roadmap in the
completed		Wiki. Thew will be collected by different means: direct
research		contact with the project coordinators, S3JU or through
projects		CORDIS and will be stored in the Engage 2 Wiki
Data from the	Surveys	This set of data aims to analyse the major trends in the
industry and	Interviews	ATM field and to define forward-looking scenarios and
the academia	Meeting minutes	future workforce profiles. They will be collected by





	Workshops' outcomes	different means: questionnaires, workshops, Industry Board and Advisory Board meetings, interviews and will be stored in the Engage 2 internal repository on Google docs.
Data from industry, academia and students	Surveys Interviews Meetings minutes Workshops' outcomes	This set of data aims to create the contents for the matchmaking app, as well as validate its functionality.
Data from participants in Engage 2 activities	Surveys Interviews Meeting minutes	The data from the participants in Engage 2 activities or Boards will be collected prior to the workshops and/or meetings and used to enlarge the Engage 2 community and keep it informed about Engage 2 activities and results. All data will be stored in the Engage 2 internal repository on Google docs. Consent forms for video recordings and pictures during events will be prepared and provided to participants for acceptance before the events

Table 2 Type of data

1.6 Data Utility

The outputs from this project (especially those related to the ATM concept roadmap and the future workforce scenarios and profiles, as well as the matchmaking app) will be useful to project partners, particularly aviation end-users, regulatory bodies, aviation students and other industries. The dissemination of the results from the Consortium will be done by several means, around a unified strategy, leveraging Consortium members' strong relationships with Engage 2 audiences – academia, industry, policy makers, students. The dissemination plan seeks to engage with the classes of stakeholders in the aviation domain that have the most to gain in the near-term from the results of the project, as well as the research communities that could build upon more fundamental findings.

All data will be processed complying with GDPR and other local legislations respecting the following provisions:

- Compliance with institutional, national, and European legislation. The protection of data collected during Engage 2 research studies will comply locally with the participants' policies and Horizon Europe guidelines.
- Each partner will process only the data necessary for Engage 2 specified purposes, and will make sure that they keep data accurate, up to date, and retained only for as long as is deemed necessary for the purpose of the collection and process thereof.
- Each partner will choose, for the data processing, employees with relevant professional qualifications, providing sufficient guarantees in terms of technical expertise and personal integrity to ensure such confidentiality. For data processing being carried out on behalf of the Controller, by other members of the Consortium, the relevant assignment will be made in writing.





• Each partner of the Engage 2 project will be responsible for the correct implementation of data protection procedures for its own organisation.





2 FAIR data

Engage 2 is committed to ensuring that research data generated and utilised within the project adhere to the principles of FAIR (Findable Accessible Interoperable Re-usable) data management. The acronym FAIR encapsulates key characteristics that research data must exhibit to maximise their utility, facilitate their discovery, and promote their widespread accessibility and reusability.

The research publications produced will be also subject to FAIR principles. The data and results (i.e. resulting data) might be under certain limitations, as most of the data used in the ATM are subject to confidentiality or licensing constraints. There might be a need for certain data to remain closed according to the principle "as open as possible, as closed as necessary", and that will depend on the data sources and topics the PhD candidates and catalyst funding project will work on. Even though at the present moment (November 2023) the Consortium is not aware about the topics of the PhD funded, (at least) some of their data won't be public (or sharable), however their publications will be.

2.1 Making data findable, including provisions for metadata

To enhance the findability of project data, Engage 2 will employ a dedicated **metadata template**. This template will serve as a structured framework for describing, discovering, and tracking data assets generated and utilised by the project, both those currently in existence and those to be created in the future.

Responsibility for completing these templates will be delegated to data owners and providers, with the resulting metadata records securely stored within the Engage 2 repository. Afterwards a metadata fiche, for each Engage 2 data collection will be made publicly accessible through trusted repositories.

Furthermore, during the first year of the project, an assessment of the assignment and management of persistent identifiers (PIDs) for the data will be undertaken, commencing with an evaluation of available PID services.

2.2 Making data accessible

Engage 2 fully aligns with a commitment to openness, ensuring that all project outcomes, including research data and scientific publications, are openly accessible. Specifically, research data required to validate the results presented in scientific publications will be deposited in a data repository concurrently with publication. In certain specific scenarios, non-public research data may be archived in the repository with the option for restricted access. This approach ensures that data remain accessible to authorised users while upholding data security and confidentiality where necessary.

2.2.1 Open access to scientific publications

Engage 2 is committed to the principles of open access for scientific publications resulting from the project. Open access to publications ensures that research findings are widely disseminated, fostering collaboration and knowledge sharing within the aviation community.





In compliance with Article 17 and Annex 5 – Specific rules on communication, dissemination and visibility of the Grant Agreement, Engage 2 beneficiaries are committed to ensure open access to peer-reviewed scientific publications relating to the project's results.

Each beneficiary must ensure open access (free of charge) to all peer-reviewed scientific publications relating to project results (in accordance with *Article 29* of the Annotated Grant Agreement). In particular, Engage 2 project participants are committed to Open Access Publishing and will prioritise publication venues and promote Open Access to its publications.

Whenever possible, project researchers will aim to publish their findings in reputable open access journals. Open access journals allow unrestricted access to research articles, increasing the visibility and impact of the project's work. Moreover, Engage 2 encourages researchers to share preprints of their research papers on preprint archives or institutional repositories. Preprints provide early access to research findings and facilitate rapid dissemination.

To facilitate open access, publications will be made available under appropriate Creative Commons licenses or similar open licensing schemes.

The project will promote the use of data citation standards to facilitate proper attribution of datasets linked to publications. This will enable researchers to access and utilize the data under the specified terms.

Engage 2 will ensure that all publications comply with the open access policies of relevant funding agencies, including those of the European Commission and any other funding bodies involved in the project. This may include requirements related to embargo periods, repository deposition, and open access publication fees.

The Open Research Europe (ORE) platform will be also used as an additional publishing option.

2.2.2 Open access to research data

The Engage 2 project recognizes the importance of open access to research data to promote knowledge exchange and collaboration within the aviation community. The partners are committed to making the project's data as openly accessible as possible, while respecting legal, ethical, and privacy considerations.

Regarding digital research data, the beneficiaries will deposit the data, including associated metadata needed to validate the results presented in scientific publications, in a research data repository, and take measures to make it possible for third parties to access, mine, exploit, reproduce and disseminate — free of charge for any user — the data as soon as possible. As an exception, the beneficiaries do not have to ensure open access to specific parts of their research data if the achievement of the action's main objective would be jeopardised by making those specific parts of the research data openly accessible.

2.2.3 Incorporating Open Science





Open Science principles are integral to the Engage 2 project, promoting transparency, accessibility, and the broad dissemination of research outcomes and data, thus enhancing the project's overall impact and contribution to the scientific community and society at large. Guided by the H2020 OSCAR (of which EASN was a partner) Code of Conduct for Open Science, and embracing the FAIR principles, Engage 2 aims at making scientific outcomes and related data generated throughout the project accessible to a broad spectrum of society, ranging from industrial stakeholders to the general public. Open Science practices will increase the expected impact of the project and will contribute to releasing higher quality of science by increasing credibility and reproducibility of research outputs. Furthermore, the research effectiveness will be significantly improved by preventing duplication contributing to research integrity and excellence. Precisely:

- Open access will be granted to all scientific peer-reviewed publications. Research data will also be shared as early and openly as possible based on the principle "as open as possible, as closed as necessary". The publication in open access journals or features will result in a more efficient dissemination. Furthermore, research papers will be freely available to the general public which will help to reach a bigger impact in terms of communication of results. Publications available in open access regime will also get more media coverage through sharing information on social media and mainstream media outlets enabling not only better science communication, but also attracting the interest of industry and general public and eventually, supporting citizen science.
- This DMP will provide support, advice and where appropriate guidelines and templates for the research data management process and research data management plan.
- A sound research data management plan will explicitly address data collection, management, information security (specifically integrity and confidentiality), preservation, sharing and publication.
- The consortium will provide mechanisms and services for storage, backup, registration, deposit, retention and preservation of research data assets in support of current and future access, during and after completion of Engage 2.
- The management process of research outputs will ensure that the data/research outputs that will be generated over the course of the project will be FAIR.
- Each research output that will be made openly accessible will be always accompanied by supporting information such as metadata to ensure reproducibility.
- Open Peer Review is an important aspect of OS, and it will be highly recommended for the project's publications over traditional peer review.

The Engage 2 consortium expects that following Open Science principles and practices will bring significant impact in the long term to the aviation research and education domain. To this end, the OSCAR Code of Conduct for Open Science will be further studied for implementation alleys throughout the project's duration, by following the practices highlighted there in as much as possible, while trying to find different solutions and implementation pathways. The principles and mechanisms for open sharing of research outputs within Engage 2 will be based on the following:

OPEN ACCESS: This practice makes publications freely accessible to as many people as possible, leading to increased visibility of research results. All publications within Engage 2 will be at least Green Open access and the relevant publication DOIs will be hosted on the knowledge hub (the Wiki). Green open access publications are usually scientific publications which are published in an institutional repository





or a private website, also known as self-archiving. In the case of Engage 2, the already existing Wiki will be utilised as an additional means to publish green open access publications. Other platforms, such as arxiv.org or bioRxiv.org, for preprint green publications will also be explored to further share publications.

OPEN DATA: Practising open data refers to making the project data as freely accessible as possible, leading to increased quality of research by making it easier to be verified and reproduced. The Engage 2 partners commit to making the research data as open as possible while taking confidentiality and IPR protection into account, following the principle "as open as possible, as closed as necessary". Relevant data sets will be uploaded to the Wiki, or links listed in the Wiki, in line with the present Data Management Plan. The Engage 2 Wiki will be used for the deposition of and access to publications and research data; in addition, the European Open Science Cloud (EOSC) for hosting and processing research data and the Open Research Europe open access publishing platform for the publication of research stemming from Horizon Europe funding across all subject areas.

OPEN SOURCE: Open-source practice refers to making the source code of the developed software as accessible and available as possible. Code sharing facilitates research reproducibility and reuse of the existing code source, in addition to building trust and generation of research at a faster pace. The Engage 2 consortium will distribute the shareable data by adopting licences that allow re-use of the data and/or the source codes and data sets in their entirety by other scholars and stakeholders. The Wiki will host or link (whenever possible) to existing and past projects, documents, published papers, videos and software code to ensure Open Science practice as a whole, including open source practice.

OPEN METHODOLOGY: This practice involves being transparent by describing and sharing the methods used throughout the project design and implementation, including the hypothesis development. Engage 2 will commit to keep its methodology and its outputs to be as open as possible. Moreover, this project will also exploit and apply already existing methodology developed and applied by Deep Blue in several EU-funded projects aimed at, among the others, defining the workforce profiles (job roles) called by the future trends and scenarios, and foster synergies between educational institutions and labour market. This directly showcases the benefits of implementing open methodology by having access to an already established methodology, use it, and reproduce it in different but related projects.

OPEN PEER REVIEW: Contrary to traditional peer review process which often takes place behind closed doors, open peer review process ensures neutrality and fosters open and fair communication between parties and will be highly recommended for the project's publications. This process increases the recognition of the reviewers' work as well as the quality of scientific publications. A closed peer review is prone to errors and such a closed process can be exploited to push through certain subjective interests unnoticed. Consequently, the Engage 2 researchers will be encouraged to participate in open peer-review processes. Examples for open peer review journals are: The Journal of Open Aviation Science – JOAS, which is the only available open-access peer-reviewed journal explicitly focused on aviation research and science, as well as others, more generic ones, such as GigaScience, PeerJ and F1000 Research.

OPEN EDUCATIONAL RESOURCES (OER): This practice directly makes educational resources, such as learning and teaching material freely accessible to as many people as possible, improving worldwide equal opportunities for education and contributing to a bigger and better-informed scientific





community. Two main strands of Engage 2 involve core activities in relation to education, training, and knowledge.

The existing Wiki, developed during Engage KTN, will be updated by providing differentiated access to the resources/information/material for students and professionals. The Engage 2 repository of ATM research containing SESAR ATM research, will be a central knowledge resource and reference centre for researchers. The repository will host (whenever possible) or link to existing and past projects, documents, published papers, videos and software code.

The Wiki will further be improved with more advanced search functionality, where researchers may turn to the hub as an accessible meta-source of research data. Engage 2 will also offer opportunities to young scientists and students at MSc and PhD level to access the Wiki including relevant training material. Training material will be developed and fed into the Wiki considering the findings of a critical review of the state of the art in the field of European ATM education/training, conducted in 2019 in the course of the Engage KTN. Various learning and development resources will be available in the Wiki whenever possible, including but not limited to training material, meta-source of research data, data on PhD and Master theses supported by the project, workshops, hackathons, and serious games. This will make the Engage 2 Wiki repository the one-stop, go-to source for information: a single European point of entry for ATM knowledge, contributing to the education of more people and indirectly contributing to the advancement of ATM science community, which will in turn lead to an enhanced collaborative effort between academia, industry, and policy makers.

CITIZEN SCIENCE: Citizen science is when science is conducted together with the citizens. Citizen science is all about being inclusive and about the integration and engagement of the civil society in research projects to make the research life cycle more accessible, transparent and understandable. Several platforms, such as Zooniverse, Citizen Science Association, European Citizen Science (ECSA) or EU-Citizen.Science, will be explored and exploited to build citizen science, i.e. carry out the project together with non-professional scientists to increase inclusiveness, integration, and engagement of the civil society in Engage 2. This in turn will enhance transparency, accountability and public participation in research, technological innovation and its related public policy formulation. Also, publications available in open access regime will feed into citizen science as they will attract more media coverage through sharing information on social media and mainstream media outlets enabling not only better science communication, but also attracting the interest of industry and general public and eventually, supporting citizen science.

Moreover, in the effort to learn from prior experiences in practising Open Science, the Engage 2 Consortium plans to also contact the projects that successfully applied Open Science in the previous SESAR calls to collect best practices. These practices, including survey results, successes and barriers will be included in the recommendations/results of the final report on the implementation of Engage 2 Open Sciences pilot and shared and communicated with S3JU and other organisations and units such as but not limited to EUROCONTROL's Performance Review Unit and the Performance Review Commission, etc.

Further information and details on the Engage 2 plan for incorporating Open Science principles within the project, including a thorough analysis of the specific mechanisms and principles to be implemented, are available in D5.24: Engage 2 Open Science Strategy.





2.2.4 Repository

The official repository of Engage 2 is Google Drive, provided by the Project coordinator. Other mechanisms and services for storage, backup, registration, deposit, retention, and long-term preservation of research data assets will be provided to support current and future access, even after the completion of Engage 2.

The Consortium understands "Trusted repositories" as essential components in the data management strategy, serving as secure and reliable platforms for data storage and accessibility. These repositories are key to offer long-term storage solutions while ensuring the integrity and safety of the data. They are seen not just as storage spaces but also to facilitate easy access to the stored information by the public. This will enable Engage 2 to commit to ensuring that research data generated and utilised within the project adhere to the principles of FAIR (Findable Accessible Interoperable Re-usable) data management and to the "Open Science" principles.

In this DMP Zenodo is highlighted as a "Trusted repository" as it is one of the best known research repositories available. Developed under the OpenAIRE program, it is available at no cost and among other features it provides a version control system, a Digital Object Identifier (DOI) and the tracking of page views and downloads. Additionally, there are other research repository services such as Dryad or Figshare that could be also used as trusted repositories and will be evaluated to determine if their features and conditions render them more suitable candidates.

2.2.5 Data

Engage 2 open results will be made accessible according to the Rules on Open Access to Scientific Publications and Open Access to Research Data.

Personal data will not be shared. Personal data refers to any information that relates to an identified or identifiable individual. This can include, but is not limited to, names, addresses, contact details, identification numbers, online identifiers, and any other data that can be used to directly or indirectly identify a specific person. Personal data is subject to data protection regulations (e.g. GDPR) and must be processed and handled in accordance with privacy laws to safeguard individuals' privacy and data rights.

2.2.6 Metadata

Engage 2 will adhere to recognized metadata standards relevant to the type of data being collected and shared. The choice of metadata standards will be determined based on community best practices and domain-specific requirements.

All open Engage 2 results deposited in a repository will provide search keywords together with their metadata. Keywords for open data will be selected from controlled vocabularies that are suitable for the specific type of the data.

The **Zenodo** deposition metadata domain model (<u>http://developers.Zenodo.org/#representation</u>) is compliant with DataCite's Metadata Schema minimum and recommended terms, with a few additional enrichments.







For Engage 2, at least the following deposition metadata fields will be provided:

- **upload_type** Type of the deposition from a controlled vocabulary (publication, dataset, software)
- **publication_date** Date of publication in ISO8601 format (YYYY-MM-DD)
- **title** Title of the deposition
- description Abstract or description for deposition
- files Deposition files identifiers, filenames, size of the files in bytes and MD5 checksum of files
- **Creators** The creators/authors of the deposition
- License Open license from controlled vocabulary "Open Definition Licenses Service"
- **DOI** Digital Object Identifier assigned by the DOI registrant (e.g., Zenodo), also used for versioning
- Keywords Free form keywords for this deposition
- related_identifiers Persistent identifiers of related publications, datasets and software
- **grants** List of OpenAIRE supported grants, which have funded the research for this deposition (101114648). Needed to establish the relationship to Engage 2 in OpenAIRE and Cordis.

2.3 Making data interoperable

Interoperability will ensuring that research data produced by the Engage 2 project can be effectively shared, integrated, and used across different systems and disciplines To promote data interoperability, all datasets will be described using standard descriptive metadata schemas such as **Dublin Core and DataCite Metadata Schema**⁵. This standardized approach ensures metadata consistency and facilitates efficient data indexing and discoverability. All relevant documentation explaining codebooks, users manuals, data collection procedures and analysis will be made available along with the data in order to guarantee intelligibility, reproducibility and the validation of the project findings.

The following standard vocabularies will be therefore used in the default metadata schema for all types of open data:

- 1 License: Open Definition (<u>http://opendefinition.org/</u>)
- 2 Funders: FundRef (<u>https://www.crossref.org/services/funder-registry/</u>)
- 3 Grants: OpenAIRE (<u>http://api.OpenAIRE.eu/</u>)

Engage 2 (meta)data will include qualified references to other (meta)data.

2.4 Increase data re-use

Article 16 of the Grant Agreement states that *the beneficiary that generates data and software owns them.* However, the owners of open results from the Engage 2 project are encouraged to release their work under a Creative Commons licence, preferably the **Creative Commons Attribution 4.0 (CC BY 4.0)**. This licence allows others to distribute, remix, adapt, and build upon the work, even for commercial purposes, as long as they give appropriate credit to the original author. For scientific publications arising from the Engage 2 project, the authors are encouraged to seek an agreement with



⁵ DataCite to Dublin Core Mapping 4.4, <u>https://schema.datacite.org/dc/doc/DataCite_DublinCore_Mapping.pdf</u>



the publisher that allows them to retain the copyright for their work and to deposit the publication in an open access repository. This will make the publication freely available to everyone.

Research data that is needed to validate the results of scientific publications will be made available as open access, either at the same time as the publication or after an embargo period imposed by the publisher. Regardless of whether an *embargo* period is imposed, information (metadata) about the publication and the related data will be made available at the same time as the publication. The metadata will include details of when the publication and the data will become available.





3 Other research outputs

This paragraph is not applicable to Engage 2 due to the type of activities foreseen in the project.





4 Allocation of resources

Efficient allocation of resources is important for the successful implementation of data management and sharing activities within the Engage 2 project. Proper allocation – both financial and human - ensures that the project can achieve its data-related objectives while adhering to budgetary constraints and timelines.

Data management will be the responsibility of the Coordinator, Deep Blue.

The project will cover the costs to make data FAIR, covered by all partners within the budget already allocated in the project. No costs are foreseen for storing open results in the project's repository (Zenodo).

Data will be preserved for at least 5 years after the end of the project. Engage 2 website will be retained and accessible for at least five years. Regarding Zenodo repository, According to its general policies (<u>http://about.zenodo.org/policies/</u>), items will be retained for the lifetime of the repository.





5 Data security

Data security measures are put in place to protect the confidentiality, integrity, and availability of project data. These measures are implemented to comply with relevant data protection regulations and to safeguard sensitive or confidential information.

The storage of the data in Engage 2 will depend on the type of data, that is, whether they are public or confidential. For confidential data a repository in the **cloud provided by Deep Blue** will be used.

On the other hand, for the dissemination of public information, Engage 2 website is the tool where the public deliverables will be uploaded as they are available, so the interested audience can follow the evolution of the project. Additionally, social networks profiles have been created, such as LinkedIn and X, where news are shared, not only of the project but also in the research field.

Engage 2 recognizes that not all data requires the same level of security. Data will be classified based on its sensitivity and confidentiality. The following classification levels will be used:

- **Public Data**. Public data includes research findings, publications, and non-sensitive data that can be openly shared with the public and research community.
- **Restricted Data**. Restricted data includes sensitive information that requires controlled access. Access to restricted data will be limited to authorized personnel only, with specific access controls and permissions.
- **Confidential Data**. Confidential data includes highly sensitive information that necessitates the highest level of security. Access to confidential data will be restricted to a select group of individuals with the highest level of authorization.

Overall, access to the data will be controlled by the person/s in charge of this task, appointed by the Project Coordinator, who will manage not only the users' permissions, but also restricting the computer authorized to access the data.

All the data will be password protected. If mobile devices are used to store data files (e.g., backup files), they will be kept in a safe place accessible only to the researchers involved. All partners are asked to keep local updated copies of all their files: all the research materials stored in computers will be subject to regular backup in order to safeguard them from accidental losses.

5.1 Data security approach

Due to the large amount of information and the relevance of it, several security measures will be taken to avoid the loss of it by making regular backup copies (including incremental backups and regular full backups). In addition, the access to these physical copies will be controlled and restricted. On the other hand, to protect information from cyberattacks it will by encrypted. In addition to software and hardware security standards, data will be protected by applying strict data protection procedures.

Any personal data will be processed legally and fairly: collection of data will be adequate, relevant and not excessive in relation to the purposes of the project; data that identifies individuals (personal data) will not be kept any longer than necessary: once the project has finished, data will be completely anonymised if possible, meaning irreversibly preventing identification of the data subject. Any





personal data will be destroyed two years past the termination of the project. The Consortium will comply with European (i.e. GDPR) and national legislation relevant to the countries where data collection is taking place.

Data collected for research purposes (including questionnaires, interviews, field observations, audio/screen recordings - where applicable), as well as promotional materials gathered during data collection activities and Engage 2 events that may be video recorded or photographed, will be subjected to current European regulations on matters of data handling and privacy (*GDPR, Regulation (EU) 2016/679*).

The research outcomes will always be reported without contravening the right to privacy and data protection. More details regarding these aspects will be reported in Ethics deliverables and the upcoming updates of the DMP.

- Secure Access Policy. Data will be encrypted, and password protected. Only members of the team directly working with the data ("need to know") will have authorisation to access the data. Each Data Controller will be responsible for de-identification of the data or establishing a procedure to be followed by other partners in charge of personal data. This data might be transferred for further processing to other project members.
- Secure Storage. Location and Hardware. All personal data will be stored on digital hard disks on computers that are not connected to WAN Internet or on removable hard disks. Removable storage will include large capacity hard drives that will be kept in locked cabinets.
- **Monitoring of Data Transfer**. Data will not be transferred outside the Engage 2 Consortium without prior authorisation.





5.2 Engage 2 data controllers

For the purposes of this document, 'controller' is understood to mean *the natural or legal person*, *public authority, agency or other body which, alone or jointly with others, determines the purposes and means of the processing of personal data*, in accordance with Reg. (EU) 679/2016, Article 4(7).

For the sake of transparency, within Engage 2, each partner is considered as an autonomous controller of the personal data processed for the purposes of the project. In addition, each partner designates a contact point for data management and data protection issues. The table below shows the list of persons who have been appointed to this role.

Partner	Organization DPO	Point of contact for Engage 2 (with email)
DBL	Vera Ferraiuolo	Micol Biscotto (<u>micol.biscotto@dblue.it</u>)
UoW	Malcolm Bacon	Graham Tanner (<u>tannerg@westminster.ac.uk</u>)
TUBS	Stephan Rehfeld	Thomas Feuerle (<u>t.feuerle@tu-braunschweig.de</u>)
UB-FTTE	Slobodan Mitrović	Radosav Jovanović (<u>r.jovanovic@sf.bg.ac.rs</u>)
FRQ	Mathias Meindl	Georg Trausmuth (<u>Georg.Trausmuth@frequentis.com</u>)
EASN	Irene Pantelaki	Irene Pantelaki (<u>irene.pantelaki@easn.net</u>)
INX	Paula Lopez-Catala	Paula Lopez-Catala (plc@innaxis.aero)
ECTL	Hans HOLDERBACH	Hans Holderbach (hans.holderbach@eurocontrol.int)
UNITS	Valentina Carollo	Lorenzo Castelli (<u>lorenzo.castelli@dia.units.it</u>)

Table X shows the contact person appointed for this purpose.

Table 3 Organisation DPO and Engage 2 PoC







6 Ethics

Although the Engage 2 project does not have ethics procedures to implement, Engage 2 activities will be compliant with the principles of dignity, freedom, equality, solidarity, citizens' rights and justice by complying with all the ethical principles and the applicable national, EU and international laws.

Humans involved in the activities are adults, not belonging to vulnerable groups, which voluntarily decide to take part in such activities. In all cases, proper, complete and transparent information and voluntary consent compilation will be ensured, regarding treatment of personal data, pictures, videos etc. All events (e.g. workshops, webinars, interviews, etc.) will be strictly limited to volunteers recruited after a clear explanation of the project activities and scopes. Engage 2 will not involve children or adults unable to give informed consent.

The procedure for participants in Engage 2 activities will strictly adhere to the conditions below:

- 1. Every participant has the right to remain anonymous;
- 2. Every participant will have his or her data protected as stated in the National Data Protection legislation and in the EC GDPR regulation;
- 3. All data released by the eventual participants brings a duty of confidentiality;
- 4. Every participants' free and informed consent is required also while doing interviews. The purpose of informed consent is to empower individuals to make a voluntary informed decision about whether or not to participate in that activity based on knowledge of its purposes, procedures and outcomes;
- 5. Every participant will also have the right to know who will benefit from his or her participation to the activity and, if they so wish, to receive information of any potential commercial exploitation of the research that involves their participation.

The Consortium partners will be made aware of the necessity to obtain the consent forms from each and single individual participating in this research.







7 Annex I: Engage 2 – DMP Questionnaire [SESAR compliant]

This tool was developed by the internal working group of Deep Blue, responsible for data protection and management. The information collected from the partners have been implemented in this version 00.04.

Engage 2 - DMP Questionnaire [SESAR compliant_v.2.0]

General Information

- 1. **1. Contact person in your organisation** Please provide the contact person responsible for data management and data protection in your organization.
- 2. **2. Contact person for this project** If different, please, provide the contact person responsible for data management and data protection in this project
- 3. 3. About the respondent Please give a brief overview of your role in the project.

[e.g. I am XX and in project ZZ I am the WP/Task Leader of WP/Task].





 4. Processing of personal data- Do your tasks involve the processing of personal data*?

*The **processing of personal data** can cover a wide range of activities. If your organisation collects personal data and anonymises it for other purposes related to the project, please answer 'yes'.

Mark only one oval.



Protection of personal data

 5. Personal data - Does your activity(s) involve the collection/processing of any of these categories of personal data?

Check all that apply

Personal data (i.e., name, ID number, date and place of birth)

Image data (i.e., pictures, photos, videos, or other identifiable illustrations of face, body and/or part(s) of body)

Audio data (i.e., audio records concerning voice, processed in an identifiable way)

Contact data (i.e., home address, email address, phone number)

Contract data (i.e., contract number, data for payments execution)

- Connection data (i.e., IP address, IMEI code)
- Location data (i.e., ZIP code, GPS position)

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	-			-		

6. **6. Special categories of personal data -** Does your activity require the collection/processing of the following categories of personal data?

Check all that apply.

Sensitive data (i.e., data revealing racial or ethnic origin, political opinions, religious or philosophical beliefs, or trade union membership, as per Article 9(1), GDPR)

Biometric data (i.e., data resulting from specific technical processing relating to the physical, physiological or behavioural characteristics of a natural person, which allow or confirm the unique identification of that natural person, such as facial images or dactyloscopic data, as per Article 4(14), GDPR)

Genetic data (i.e., data relating to the inherited or acquired genetic characteristics of a natural person which give unique information about the physiology or the health of that natural person and which result, in particular, from an analysis of a biological sample from the natural person in question, as per Article 4(13),GDPR)

☐ Health data (i.e., data related to the physical or mental health of a natural person, including the provision of health care services, which reveal information about his or her health status, as per Article 4(15), GDPR)

Data related to criminal convitions or offences

Other:





 7. Purpose(s) of the processing of personal data - Please specify the purpose(s) of the processing of the categories of personal data indicated in the previous answer.

Check all that apply.

	Research	Administration	Validation	CDE	Other
Image data					
Audio data					
Contact data					
Contract data					
Connection data					
Location data					
Special categories of personal data					

8. **8. High risk processing activities** - Does your activity include any high risk processing activities?

0	Check all that apply.
	Profiling of individuals
	Systematic monitoring of individuals
	Processing large scale of special categorie of data

Intrusive method of data processing (e.g. surveillance, geolocation tracking,)

Other:	

 9. Specific purpose(s) of high risk processing activities - If you have selected one of the previous options, please explain why your activities require you to engage in high risk processing activities.





10. **10. Security of personal data** - Please, specify how your organisation will process personal data within the project

Check all that apply.

	Clear referece	Restricted access	Pseudonymisation	Anonymisation	N/A
Personal data for research purposes					
Special categories of personal data for research purposes					
Personal data for administrative purposes					
Special categories of personal data for administrative purposes					
Personal data for validation purposes					
Special categories of personal data for validation purposes					
Personal data for CED					
Special categories of personal data for CED					





11. **11. Transfer of personal data to non-EU countries -** Do you plan to transfer personal data from the EU to any of the following non-EU countries?

Check all that apply.

Andorra
Argentina
Canada (commercial organisations)
Faroe Islands
Guernsey
Israel
Isle of Man
Japan
Jersey
New Zealand
Republic of Korea
Switzerland
the United Kingdom
Uruguay

12. 12. Potentially risky data transfers to and from non-EU countries - Do you plan to transfer personal data to or from non-EU countries not mentioned in the previous list?

Indicate the type of personal data and countries involved

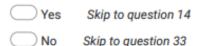




 13. Generation or re-use of other data - Will your organisation generate or re-use other data* during the project?

***Data** generally means any digital representation of acts, facts or information and any compilation of such acts, facts or information, including in the form of sound, visual or audiovisual recordings.

Mark only one oval.



FAIR general assessment

14. 14. Data reuse - Will your organisation reuse existing data?

Mark only one oval.



 15. Data Origin(s)/Source(s) - Please list the data sources* your organisation intends to use in the project.

*Data sources include open data repositories, sector-based datasets, etc.





16.	 Interoperability and re-use of data - Please give reasons if re-use of existing data was considered but rejected. 				
17.	17. Purpose(s) of data generation/re-use - What is the purpose of the data generation or re-use and how does it relate to the objectives of the project?				
	Check all that apply.				

Research Administration Validation CDE Others

18. 18. Data provenance standards - Is the provenance of the data thoroughly documented using appropriate standards*?

*Appropriate standards refer to information about entities, activities and people involved in the production of a piece of data or thing that can be used to form judgments about its quality, reliability or trustworthiness (e.g. PROV-OVERVIEW; PROV-DM; PROV-CONSTRAINTS; PROV-O; PROV-N; etc.).

Mark only one oval.

YES, we already use appropriate standards

NO, but we will defined/adopted appropriate standards if needed





19. 19. Size of data - What is the expected size of the data that you intend to generate or re-use?

Mark only one oval.

\subset	🗋 кв
\subset	МВ
\subset	GB
\subset	ТВ
\subset	I don't know yet

20. 20. Data utility - Who might your data be useful to outside your project?

Check all that apply.

Project beneficiaries
 Academic community
 Sector-based networks
 National institution(s)
 EU institution(s)
 International Institution(s)
 Other:

FAIR - Findability assessment

21. 21. Data identification - Will the data produced by the project be identified by a persistent identifier?

Mark only one oval.

Yes





22. 22. Making data findable - Will rich metadata be provided to allow discovery?

Mark only one oval.

Yes
No

FAIR - Accessibility assessment

 23. Data Repository(s) - Will your organisation deposit the project data in a trusted repository*?

*If you need a help verifying trusted repositories, please, refer to this link

Mark only one oval.

\subset	\supset	Yes
\subset	\supset	No

24. 24. Contractual arragements - Does your organisation have a contractual arrangement* with the identified repository where your data will be deposited?

*A contractual arrangement is intended as any bilateral agreement that sets out the terms and conditions for using the repository and depositing data. It can include both free and paid services.

Mark only one oval.







25. 25. Open availability - Will all data be made openly available*?

*The Grant Agreement and the Consortium Agreement may be helpful to check if your organisation has raised some availability issues, probably due to intellectual property and trade secret protection.

Mark only one oval.



 26. Limited availability - If certain datasets will not be shared or will be shared under restricted access conditions, please, explain why*.

*The Grant Agreement and the Consortium Agreement may be helpful to verify if your organisation has identified some availability issues, probably due to the protection of intellectual property and trade secrets.

27. 27. Embargo conditions - if an embargo is applied to allow time for publication or to seek intellectual property protection (e.g. patents), state why and for how long, bearing in mind that research data should be made available as soon as possible*.

*The Grant Agreement and the Consortium Agreement may be helpful to check if your organisation has identified any availability issues, probably due to intellectual property and trade secret protection.





28. 28. Access protocol(s) - Will the data be accessible via a free and standardised access protocol?

Mark only one oval.

Yes
No
I don't know yet

- 29. 29. Accessibility of restricted data If there are restrictions on use, how will access to the data be provided both during and after the project?
- 30. 30. Data access committee Is there a need for a data access committee (e.g. to evaluate/approve access requests to personal/sensitive data)?

Mark only one oval.

Yes

___ No

I don't know yet

FAIR - Interoperability assessment

31. **31. Interoperability best practice(s)** - Will you follow the interoperability best practices endorsed by your professional community?

Mark only one oval.

Yes

O No

I don't know





32. 32. Data validation - Will your data include qualified references to other data (e.g. other data from your project, or datasets from previous research)?

Check all that apply.

] readme files with information on methodology
	codebooks
	data cleaning
C	analyses
	variable definitions
	units of measurement
	This will be explored throughout the project
-	,

Metadata

If you have any doubt, please, refer to <u>FAIRsharing.org</u> resourses or see the <u>Horizon Open</u> <u>Data Guidelines</u>

33. 33. Metadata - Will your organisation generate/use metadata?

Mark only one oval.

____Yes

No Skip to question 39







34. 34. Type(s) of metadata - What metadata will be created?

Check all that apply.

Structural metadata - i.e., metadata that describes the structure, type, and relationships of data

Descriptive metadata - i.e., standard for encoding descriptive, administrative, and structural metadata regarding objects within a digital library

Preservation metadata - i.e., the information a repository uses to support the digital preservation process

Provenance metadata - i.e., the origin or history of data and is an important piece of metadata to make research transparent and reproducible

Administrative metadata - i.e., the information to help manage a resource, like resource type, permissions, and when and how it was created

Sensitive data discovery and Classification

This will be explored throughout the project

35. 35. Disciplinary and general standards - Will your organisation use metadata disciplinary or general standards*?

*Disciplinary or general standards are specifications for the minimum information that should be collected about research data in order for it to be reused. Many academic disciplines have supported initiatives to formalise metadata specifications.

At this link you find the main categories grouped by discipline

Mark only one oval.







 36. Exceptions - If metadata standards do not exist in your discipline, please outline what type of metadata will be created and how.

37. 37. Indexing - Will metadata be provided in a form that can be harvested and indexed?

Mark only one oval.

Ves

O No

I don't know yet

38. 38. Metadata qualified references - Will your data include qualified references to other data (e.g. other data from your project, or datasets from previous research)?

Mark only one oval.

Yes

🔵 No

I don't know yet





39. 39. Resource allocation - Will your organisation support any data management and data security costs within the project (e.g. direct and indirect costs associated with storage, archiving, re-use, security, etc.)?

Mark only one oval.

C	\supset	/es
C	\supset	No
C	\supset	Maybe

 40. Project IT Services - If your organisation will be providing IT service(s) for the project, please specify the nature of the service(s)*.

*e.g. Microsoft Team, G-Drive, specific fireware or access protocols ** Please enter the name of the service provider in 'Other'.

Check all that apply.	
Project server	
Onsite server	
Cloud service(s)	
Cybersecurity service(s)	
Other:	

 41. Security Policy - Please select the current data protection policies enforced in your organisation

Check all that apply.	
Secure Storage Policy	
Anonymisation Policy	
Secure Access Policy	
Secure Sharing Policy	
Monitoring of Data Transfer	
Other:	



