SEUS
Smart European Shipbuilding

Funded by the European Union

NTNU CADMATIC CONTACT Software ULSTEIN GONDAN SHIPBUILDERS SARC NHL STENDEN UNIVERSITY OF TURKU

INITIAL DATA MANAGEMENT PLAN (M6)

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Executive Summary

This is an initial report on the Data Management Plan, in accordance with the HORIZON EU data management guidelines, the SEUS data management plan defines the management policy for the data that will be generated in the project, specifically what types of data are to be generated in the project, whether and how they will be made open and accessible for verification and re-use. It also specifies how it will be curated, processed and stored. It is worth to mention that three of the SEUS partners are software developers, and they comply already with EU guidelines in Data Protection guidelines. The project will support openness according to the EU FAIR approach and the principle "as open as possible, as closed as necessary". The project has no ethical issues.

This document is part of WP7 of the SEUS project (task 7.3) and is responsible for the elaboration of the project's data management requirements and policies.

This version of the document is the first version due at the end of the sixth month of the project (M6). This document will evolve during the project lifecycle and will be updated at M18, M36 and M48, as project implementation progresses and significant changes occur to include new information, new datasets and results..

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1. Purpose and Overview

1.1. Purpose

The organizational structure of SEUS has been chosen according to the DESCA model grant agreement governance structure such that the objectives can be achieved within the project's lifetime, thereby guaranteeing the highest quality possible.

This document, D7.3 – Initial Data Management Plan (DMP) is a result of the SEUS project. As specified in the guidelines, the DMP is a document outlining how research data will be managed during a research project, and also after the project has been completed. It should describe what data will be collected, processed or generated, making explicit what methodology and standards will be used, whether and how this data will be shared and/or made open and how it will be curated and archived. No ethical issues are expected with the data from this projects.

1.2. Project overview

The main ambition of the Smart European Shipbuilding project (SEUS) is to develop a smart platform dedicated to shipbuilding and its downstream and upstream lifecycle phases. This will be achieved by architecting an integrated platform for a combined and open solution incorporating CAE, CAD, CAM, and PDM software and testing it at shipyards. The new platform solution will be built with state-of-the-art European shipbuilding expertise provided by academic and industrial consortium participants. It intends to develop novel practices for human-centric knowledge management in shipbuilding, the use of NLP, and data-driven AI design elements in the current consensus or intelligent technologies and Industry 5.0.

The SEUS project will develop, implement, test, and qualify software solutions with an Industry 5.0 mindset for the European shipbuilding market. Smart technology, in terms of digitalization and cyber-physical systems, including humans, are concepts that have never been built from a shipbuilding perspective. Current solutions used by shipyards include significant parts of manual data handling and are prone to a high level of human error or a fragmented adaptation of PLM from other industries, such as aerospace, automotive, or other discrete manufacturing. The shipbuilding industry uses many computational tools to plan, design, simulate, and build vessels and other marine products, such as offshore platforms or other floating constructions. Consequently, the digital information chains of shipbuilding are more weakly integrated than in discrete manufacturing industries and thus lack support for a digital thread: digital continuity, digital lifecycle management, and digital ship operation support. This is an obstacle to gaining efficiency and to implementing new business models based on digital innovations and the development of IT technology. We have set up seven objectives towards a stepwise progress over 4 years:

1. Create workflow activity map and use cases applying smart technology and Industry 5.0 concept, specific to European shipbuilding

2. Enhance the human-centric competitiveness of shipbuilding and reflect diverse values of stakeholders, including shipyard workers, shipowners, operators, users/passengers, and shipbuilders in general

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3. Build a shipbuilding-specific PLM platform comprising defined data models and the selected elements of CAE/CAD/CAM and PDM solutions

4. Develop a flexible platform that supports multiple instances of workflows to facilitate rapid early designs, and is fit to support AI tools and virtual prototyping

5. Ensure openness and interoperability of the platform while keeping it cyber secure

6. Test and implement in an industrial environment – developing the concept of the digital shipyard.

7. Quantify added value gains provided by the developed platform, creating a business model of exploitation, and dissemination of project results

The technology readiness level (TRL) targeted by the project is 8-9, corresponding to the maturity level of a completed and qualified (tested in a large-scale pilot installation) platform, ready for a commercially competitive operational environment. The aimed shipbuilding platform will integrate existing computational tools with TRL 9, commercially exploited in shipbuilding. It will incorporate Industry 5.0 concepts (human-centricity, sustainability, and circular economy) and progress through the process of maturing TRL from level 4 (initial technology validated by combining existing software parts, including AI and ML) to level 7-9 (integrated platform with developed use cases, tested in shipyards).

2. Smart Platform - SEUS

The core of the project lies on the development of a smart PLM platform incorporating CAD/CAM/CAE elements in line with shipbuilding practices. It consists of the assessment of products and practices already available in the consortium about the needs and standards compiled in the previous phase. Extensive software development will enhance existing toolsets and implement digital support for the use cases and scenarios, representing the computational tools for shipbuilding development stressed in the call. A detail of the desired elements in this development is observed in Figure 1.

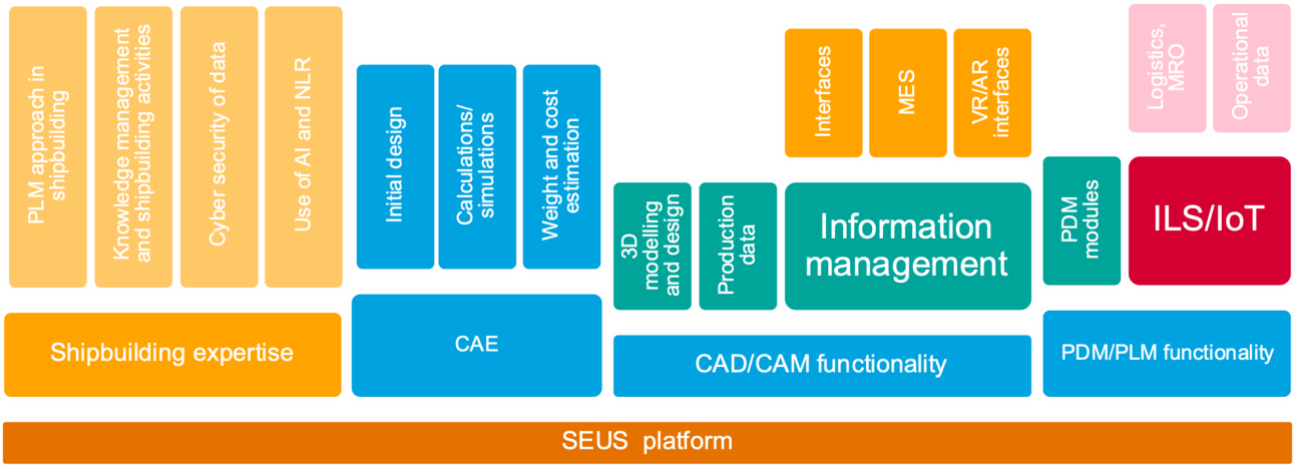

Figure 1 - SEUS Smart Platform Elements

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The SEUS Smart CAD+PLM platform integrates the following main elements: CAE modules, CAD/CAM modules, PDM/PLM selected applications and features, and embedded shipbuilding expertise. CAE modules address functionality related to initial and early design stages, such as hull shape form calculations, stability, weight estimations, and interfaces for CFD and FEM calculations, incorporating AI and a data-driven approach to design.

CAD/CAM modules include specialized applications for functional ship design (P&IDs, Electrical schematics), 3D detailed, and production design. It incorporates the reuse of initial design models, 3D modeling, and arrangement (Hull, Piping, Outfitting, HVAC, Cable 3D design, and other outfitting elements) and provides an automated output of fabrication data in a traditional format of 2D documentation along with the direct output for CNC-controlled equipment and robotized manufacturing, all ready for an integrated virtual prototype environment.

PDM/PLM elements consist of selected modules for data management and product life cycle support, including project and change management, document management, Bill of Materials management, IoT integration, and ILS support. This sets a solid basis for the maturity management-based PLM concept that would enable support for functional safety, traceability, and compliance for the shipbuilding industry.

The partners' shipbuilding expertise guides effective application of the platform elements to industrial setups. As part of the broader cyber security solution for the project, a series of cyber security workshops will be conducted with project team members and support teams. Those workshops will address issues of cyber threat awareness (including threats to AI apps), secure programming practices, active cyber security countermeasures, cyber security hygiene, and the development of the project's Information Security Management System (ISMS). A more complete public description of the project is found at its website, under resources: https://www.ntnu.edu/seus/resources.

3. Data Description and Management

3.1. Key Data Categories and Description at SEUS Project

The purpose of data collection/generation in SEUS relates to the development of the smart platform elements from Figure 1. No ethical issues are related to the project, according to the proposal.

Data collection will comply with all national and European ethical and legal requirements:

- Data and information management according to the General Data Protection Regulation (GDPR)[1].
- FAIR Data Principles: set of guiding principles for making data findable, accessible, interoperable and reusable[2].

[1] European Parliament and Council. *Directive 95/46/EC*. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:31995L0046&from=EN [Accessed 22 November 2021].
[2] Wilkinson et al, M., *The FAIR Guiding Principles for scientific data management and stewardship*. Available at: https://www.nature.com/articles/sdata201618.pdf [Accessed 22 November 2021].

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The data that will be managed in this DMP are informative (such data are related to e.g., reports, publications, dissemination activities, questionnaires, etc.), and technical (such data are related to e.g., measurements, simulations and datasets produced by partners, etc.). From this classification, SEUS will distinguish data derived from the project into the following key categories:

Table 1 – Key categories of data expected to be generated at the SEUS project

Underlying Research Data	Data produced by the research activities (including associated metadata), and used to validate the results presented (e.g., in scientific articles, dissemination activities, etc.). In line with the general principle 'as open as possible, as closed as necessary', the partnership will provide open access to research data and linkage to the respective publications, to enable the scientific community to review and validate results based on the underlying data.
Operational and observational data	This category includes curated or raw data generated from technical and research activities, such as software development, qualitative and quantitative surveys, project management (operational data), and data from qualitative activities, such as interviews and forms. The data in this section is mainly of a confidential data, only accessible to project partners. Data that will be made open will be published at the end of the project through other channels, via WP6 (Dissemination and Communication).
Monitoring and evaluation data	This data will be captured to track KPIs of project performance in WP4 (Shipyard Implementation). It consists most of confidential data, but it is intended that some part of it will be anonymized and used in public examples of the platform.
Reusable documentation, tools, and knowledge	These types of data relate to both general and project-specific documentation, including the training materials methods, tools, software and underlying source code needed to replicate the results. This category also includes data that will be used for dissemination activities. All data that will be made public will be published in the repository and part of them, into Website of the project.

Pre-existing datasets, owned by SEUS partners, may be used to providing inputs and boundary conditions data for the smart platform. The partner who owns that dataset and makes it available to the project (unless otherwise stipulated in section 25 GA).

The management of data generated or collected in SEUS will be organised according to the three levels of accessibility defined below, i.e., data from private individuals, data confidential to project partners, and data made public:

- **Private data**: partners may decide to store these specific data on the servers of the institution/company to which they belong. It is specified that these types of data are outside the scope of the SEUS DMP.
- **Confidential Data, only accessible to project partners**: this type of data will be stored on the central server, which will be used for the duration of the project. It will also be agreed with the partners how the data stored on the server will be managed during and at the end of the

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project. This includes, for instance, raw data and software development activities (source codes and related documentation) which will be managed by the partners concerned using the project repository (SharePoint – See Quality and Management Plan, D7.1). As part of the management of this category of data and to facilitate software development activities, other repositories can be used by partners, as long as they offer similar accessibility resources and meet the requirements of the European Commission, especially where sensitive data are present.

- **Data made public:** the data that will be made public will be deposited on an open access repository FAIR aligned. This type of data includes all data used in the project that is not protected by a confidentiality or security clause, regulated by data protection, or any other clause that would conflict with the publication of the data. Other mechanisms for publishing public data will include the website and Open access to scientific publications data.

At the time of delivery, most Tasks have not yet fully defined the type and structure of data they need or will generate or can make available. Pending detailed descriptions, the following table shows the data management summary template to be used within the DMP and within Tasks for documentation.

A Template for the dataset is presented as suggestion in Table 3.

Table 2 – Dataset description template

Data set reference and name	Identifies the data set to be produced
Data set description	This will describe the data generated or collected, their origin, nature, and whether they are used for scientific publications. Information will also be provided on the existence (or otherwise) of similar data and the possibilities for integration and re-use, and to whom they might be useful.
Data source, data ownership	Name of the partner that produced the data and explanation of the purpose of treatment
Metadata Standards, data formats, vocabularies	Reference will be made to appropriate existing metadata standards and vocabularies of the discipline governing data collection, aggregation, storage and sharing.
File Format	Description of file format used
Storage	Description of the procedures that will be put in place for data retention, including an indication of how long the data are to be retained, their approximate final volume and what the associated costs are and how they are expected to be covered.
Data sharing	Description of how the data will be shared. This section will also cover identify the repositories where the data will be stored, indicating the type of repository
Security & Privacy considerations	Should consider ethical issues, related to rules on personal data, but also implications on intellectual property, commercial, privacy and security aspects.
Dissemination Level	Detailing access procedures (e.g., whether widely open or restricted to specific groups), embargo periods (if any),

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	dissemination and sharing methods (e.g., software required and other tools to enable re-use).
Stakeholders	Description of stakeholders interested in data reuse

Data will be all in digital format that can be interpreted by various software technologies (open and commercial). The data generated by the research activities in the SEUS project will be raw data, analysed, processed and published, the data analysis source code, documentation (metadata and software), result and conclusion. A list of the type and format of data is expected to be presented at the final DMP, including open and proprietary formats.

3.2. Data management and Sharing Plans

General data from the SEUS project should be stored at the repository (SharePoint), managed by the coordinator (NTNU). Specific data connected to the software development is handled by the each WP coordinator, depending on their level of openness (private, public or partners only), taking into account the ethical, commercial and confidentiality constraints of handling sensitive or closed data. Therefore, the project considers the use of different sharing mechanisms, with the aim of making the research data of the SEUS project replicable, or at least reproducible or reusable. The main strategies to make the data generated by the project both open and FAIR compliant are described below.

For data whose nature will be public, the following publication mechanisms will be used to ensure the openness of the data:

Website: With reference to the plan outlined in WP 6 (D6.6 - Plan for the Exploitation, Dissemination and Communication of results) the data produced by the research activities in the form of tangible and reusable knowledge (articles, publications, etc.) will be published in a publicly accessible form on the website (https://seus-project.eu/).

The website will be mainly used for the opening of the results and conclusions for the general public and also for the expert public (researchers, energy experts, professionals, etc.). Information will be conveyed through scientific articles, e-learning materials, articles, dissemination materials, social media posts, local networks and platforms.

Personal data (e.g., contact details of stakeholders/companies, newsletter subscriber data, etc.) will be treated confidentially and in accordance with legal regulations on the protection of sensitive data, and the information will be stored in accordance with the retention periods stipulated by law. Finally, confidential results that could harm the commercial interests of partners will not be published.

Open Access to scientific publications: as specified in the GA (Art. 29.2 and 29.3) each beneficiary must ensure open access (free online access for any user) to all peer-reviewed scientific publications related to its results. In addition, the beneficiary must aim to deposit at the same time the research data needed to validate the results presented in the deposited scientific publications. Data underlying research activities, will be provided as support material for research articles published in journals, typically with the data files published by the publisher of the article. A large number of journals and publishers support the addition of supplementary material to research articles, including datasets.

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Open-Data Repository: open data is data that can be freely shared and reused by anyone, FAIR data is data that follows a set of good practices for data sharing, respecting any ethical, legal or contractual restrictions (data may contain personal information, be subject to copyright, be protected by patents or trade secrets). In order to make open data in line with FAIR principles, the data produced by the research will be deposited in a repository designed to support the publication of research data. A curated and FAIR-aligned generic repository for open research data from all academic disciplines will be decided in the future – at the moment we are using the features discussed in in *dataverseNO* (https://dataverse.no/), as baseline, based on feedback from other EU projects at NTNU.

For data that will be confidential, only accessible to project partners, we plan to use internal tools provided by the software development partners (CADMATIC; SARC and CONTACT). Other raw data generated by the project (used or unused) will be stored in the repository (SharePoint) at NTNU, for at least 10 years after the project is finished. This can be extended if necessary.

Depending on the area of expertise, the data generated under the SEUS project may be useful to:

- SEUS consortium;
- Maritime Industry in Europe
- European Commission services and European Agencies;
- EU National Bodies;
- The general public including the broader scientific community;

4. FAIR Data

Making data findable, including provisions for metadata

In accordance with FAIR Data Principles guidelines: set of guiding principles for making data findable, accessible, interoperable, and reusable[2]. In the following, processes and mechanisms to make data adhere to the FAIR Data Principles will be made explicit. Starting with these guidelines, to ensure that data is **findable (F)** the following issues must be specified:

- According to the **first principle (F1)**, to make data 'findable', **metadata must be assigned a unique and persistent global identifier (DOI)**. An option is to use dataverseNO repository, which will be considered in the future.

- According to the **second principle (F2)**, to make data 'findable', **data must be described with rich metadata**. An option is to use the metadata model from dataverseNO repository which will be considered in the future. To make documents findable within the repositories, metadata will be included with the document, metadata documentation will be provided in two ways, in the metadata fields and in a separate *ReadMe-like* file that must be uploaded along with the data files.

- According to the **third principle (F3)**, to make data 'findable', **all metadata must clearly and explicitly include the identifier of the data it describes**. To meet this requirement the PID (DOI or Handle) of the dataset will be part of the metadata record presented on the dataset landing page; the PID of the file will be part of the metadata record presented on the file landing page; and finally, both the PIDs of the dataset and the file are included in the exported metadata files. All three implementations are also adopted in DataverseNO.

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- According to the **fourth principle (F4)**, to make data 'findable', **retrievable metadata is recorded or indexed in a searchable resource**. To meet this requirement dataset published with DOIs in a Dataverse-based repository are collected and indexed by DataCite Search. Through DataCite this metadata is made available to several other search services, including BASE (Bielefeld Aca-demic Search Engine) and the search system used by libraries at Norwegian universities and university colleges. Schema.org metadata is encoded in Dataverse dataset landing pages and indexed from there by Google Dataset Search.

Approach towards search keyword: In modern repositories, like DataverseNO, documents can be searched in two distinct ways, basic and advanced. In the basic search mode, queries or exact phrases can be used (text character between quotes). In the advanced search mode, search terms can be entered for collections, dataset metadata (citation and domain-specific), and file-level metadata. It is also possible to search for tabular data files, with variable names and labels.

Approach for clear versioning: Individual file names will contain version numbers that will be incremented with each revision. Version control mechanisms are implemented within modern repositories to keep track of any changes to metadata or files (e.g., uploading a new file, changing file metadata, adding or changing metadata) once the dataset is published. This means that a new version of this dataset will be created once the published dataset has been modified.

Strategy for naming files and folders (and document it in metadata): Files and folders are organized within the SharePoint of the project – See D7.1 Quality and Management Plan. Future versions of the DMP will include more details about naming.

Making data openly accessible: To ensure that data is accessible (A) the following issues must be specified:

- According to **the first principle (A1) and their sub-priciples (A1.1, A1.2)** to make data 'accessible', metadata must be retrievable from its identifier using a standardised communication protocol, i.e., a system of rules allowing the transmission of information between communication systems. To meet this requirement, the data and metadata stored in the a modern repository are accessible through a number of protocols, including Hypertext Transfer Protocol (HTTP), rsync over Secure Shell (SSH), and Representational state transfer (REST) via Application programming interface (API), which provides access through, for example, cURL.

- According to **the second principle (A2),** to make data 'accessible', **metadata is accessible even when the data for some reason is no longer available.** This will be considered in a future version of the DMP.

Specify what methods or software tools are needed to access the data: Published datasets are discoverable and openly available to anyone with Internet access. Items are archived in formats that can be opened and read using freely available software and highly open data formats.

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Time of conservation of data (public and not): Public data is expected to be openly accessible for at least 10 years after DOI assigned.

How access will be provided in case there are any restrictions on use of data: In case there are restrictions on use of data**,** roles can be assigned to users that define the specific actions users can perform on data sets and/or files. Restrictions may differ depending on the users and the predefined rules, but generally relate to secure (locked) data storage and password-protected computers and prohibit the storage of data on the hard disks of computers that can be accessed through a network connection. These agreements may also limit the types of analysis that are done by the user.

Data will be made openly available: Details of which data will be made openly available, and the reasons for any data being kept closed, will be provided in future updates of the data management plan.

Making data interoperable: To ensure that data is interoperable (I) the following issues must be specified:

- According to **the first principle (I1),** to make data 'interoperable', **metadata must use a formal, accessible, shared, and widely applicable language for knowledge representation.** As this project converges data from different proprietary formats, more information about this will be presented in the updated version of the DMP.

- According to **the second principle (I2)**, to make data 'interoperable', **the use of metadata vocabularies that follow the FAIR principles is necessary**. To meet this requirement, FAIR-controlled vocabularies and data models can be implemented manually in the selected repository, e.g., they can be implemented as keywords in the general metadata section.

- According to **the third principle (I3)**, to make data 'interoperable'**, metadata must include qualified references to other (meta)data**. This will be considered in a future version of the DMP.

Increase data re-use (through clarifying licenses): Research results are shared as openly as possible to maximize the use and reuse of research results, excluding proprietary data from partners. Reusable metadata is defined in the FAIR Data Principles as metadata that is richly described with a plurality of accurate attributes and relevant attributes, as follows:

- **According to the principle of re-usability (R1) and its sub-principles (R1.1, R.1.2, R.1.3),** to make data 'reusable', **metadata must be released with a clear and accessible licence to use the data** (sub-principle R1.1). To meet this first requirement, the selected repository must offer the possibility to define a license when depositing the dataset and allows to display the license information in the descriptive metadata.

- **According to** the data reusability **sub-principle (R1.2)**, **metadata must be associated with a detailed provenance** (origin of the data, how it was obtained, processed and by whom). To fulfil this requirement, the repository needs support for rich metadata that includes information about data authors and other contributors, data providers, data distributors, as well as related data (e.g., used as input data).

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- **According to the sub-principle of data reusability (R1.3)**, **reusable metadata must meet community standards relevant to the domain**. This will be considered in a future version of the DMP.

Data embargo period: All data sharing and publication will respect international, European and national privacy laws, as well as the commercial interests and intellectual property rights of the project partners, which may lead to withdrawal from publication or embargo periods on some data produced by the project. Such decisions will be explained better in the next update of Data Management Plan.

How long data will be available for reuse once they are shared and quality assurance processes in place: Similarly, the detail about how long data will be available for reuse once they are shared and the description of any quality data assurance processes, will be provided in future updates of the data management plan.

5. Allocation of resources and Costs

Cost for data storage and backup: during the project, all data will be stored on secure, dedicated institutional servers provided by NTNU (SharePoint) where they can only be accessed by project partners (budget is allocated for storage). GDPR rules will be respected, and regular back-ups will also be made to ensure that data is not lost in case of technical problems with the server, accidental deletions and/or overwrites.

Cost for data sharing: the costs of producing scientific publications, hosting a project website and depositing open access data are included in the SEUS budget as eligible costs. No additional costs for data sharing are foreseen beyond those already indicated in the budget as eligible costs.

Cost for data transfer, access and security: The resources, costs, potential value, associated with long-term preservation strategies, as well as how the data will be preserved beyond the project and for how long, will be the subject of discussion in the forthcoming Meetings of the Consortium. The objective of SEUS is to align with the long-term preservation of the data described in the present management plan.

6. Data access and security

A fundamental task is to manage the data in a secure way. SEUS will promote the use of cyber security best practices and state-of-the-art data security measures. The goal of these measures will be to ensure that data remains consistent over the lifetime of the project and there exist alternatives to the main files in case they disappear or get corrupted.

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All ICT systems will be designed to safeguard collected data against unauthorized use and to comply with all national and EU regulations. An encryption component will add an extra layer of security to the data files and information.

All the generated data will be managed, processed, and stored in a secure environment (lockable computer systems with passwords, firewall system in place, power surge protection, virus/malicious intruder protection) and by controlling access to digital files with password protection.
In more details, the following mechanisms will be implemented:

- **Access Control**: the access to the system will be allowed only after controlling the level of access that each user has depending on their role. There will be appropriate mechanisms to define and enforce such access control (e.g., firewalls, file systems permissions, secure log-in) including physical control.

- **Data Confidentiality**: within the scope of the project, the protection of information from unauthorized access and disclosure must be preserved by restricting per-user access and encrypting the information during transmission and during storage. After the defined retention period expires, ensure information erasure/destruction.

- **Data preservation**: data backup and maintaining techniques will be used to assure long-term value and integrity of data.

- **Data backups** are expected to occur once a week, though this is subject to change based on the amount of data that will ultimately need to be backed up.

- **Data anonymization techniques** (such as data masking, pseudonymization or data swapping) will be used as well during the project lifetime.

Additionally, National strategy on access to and sharing of research data[3] and NTNU's policy for open research data 2018-2025[4] are well in line with open access and data management guidelines in Horizon 2020[5].

7. Roles and responsibilities in the project

Within this section of the DMP, data management responsibilities are assigned. In general, the project partners assume responsibility for collecting, managing, and sharing research data in their tasks, in

[3] Government.no., *National strategy on access to and sharing of research data*. Available at: https://www.regjeringen.no/en/dokumenter/national-strategy-on-access-to-and-sharing-of-research-data/id2582412/sec1 [Accessed 22 November 2021].
[4] NTNU., *NTNU's policy for open research data 2018-2025*. Available at: https://innsida.ntnu.no/documents/portlet_file_entry/10157/NTNU+Open+Data_Policy.pdf/42f1ed94-4d4f-4d6b-a033-dd42a02ccefc?status=0 [Accessed 22 November 2021].
[5] European Commission., Data management - H2020 Online Manual. Available at: https://ec.europa.eu/research/participants/docs/h2020-funding-guide/cross-cutting-issues/open-access-data-management/data-management_en.htm [Accessed 22 November 2021].

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accordance with the data use requirements defined by the consortium agreement. The project coordinator (NTNU) will act as the data manager for the project administrative data.

Data controller: each beneficiary is ultimately responsible for the control of their own data, complying with obligations under both national and international data protection legislation. NTNU will control the general data under the repository.

Data processor: according to the General Data Protection Regulation 2016/679[6] data controllers and processors are fully responsible for processing operations, which means that each beneficiary is ultimately responsible for their own data collection and processing. Project partners are required to follow internal national data protection regulations and the European GDPR.

In line with the principles of the GDPR, **project partners are responsible for the data they produce (Data processors)**, which means **they must coordinate with the data controller** to ensure that procedures and protocols are adhered to with internal processes and national regulations (including how to obtain consent and procedures that must be put in place in the event of privacy breaches).
The following responsibilities apply to datasets on an individual basis:

Acquisition/capture of (raw) data responsibility

- **For pre-existing datasets owned by any of the SEUS partners or other parties,** the partner who owns that dataset and makes it available to the project (unless otherwise stipulated), will be the data manager and will coordinate with the with the data controller to follow established means and purposes for processing.
- **For the creation or acquisition of new datasets,** the partner(s) creating or acquiring the dataset will be the data controller(s) and will coordinate with the with the data controller to follow established means and purposes for processing. This applies to all types of data research.

Metadata production responsibility: each partner is responsible for his own metadata, which will be agreed upon with the data controller according to the predefined and available standards.

Data sharing responsibility: the data processor will coordinate with the data controller to agree and establish the details of how the data will be shared, including access procedures, embargo periods (if any), guidelines for technical mechanisms for dissemination, and necessary software and other tools to enable reuse, while also determining whether access will be broadly open or limited to specific groups. Similarly, it will identify the repository in which the data will be archived specifically indicating the type of repository.

Data archiving and retention (including storage and backup) Responsibility: depending on each data set, the data archiving and retention procedures that will be put in place for long-term data retention will be the responsibility of the data controller, after agreement with the partners involved. This includes stating how long the data is to be retained, what its approximate final volume is, what the associated costs are, and how these are expected to be covered.

[6] European Parliament and Council. *Regulation (EU) 2016/679*. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32016R0679&from=EN [Accessed 22 November 2021].

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Quality assurance of data responsibility: data and information that comply with data quality standards are critical to the success of the SEUS project. As data processors, project partners are responsible for the data they produce, and therefore also preside over specific procedures to ensure that data and information meet quality standards.

Data security responsibility: partners, as data processors, will pay special attention to routines to ensure the confidentiality of data storage and processing. In coordination with the Data Controller, they undertake to implement all appropriate technical and organisational measures necessary to protect potential personal data against accidental or unlawful destruction or accidental loss, alteration, unauthorised disclosure or access, and against all other unlawful forms of processing, taking into account the particular nature of the processing operations carried out.

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