



AutoMated Vessels and Supply Chain Optimisation for Sustainable Short SEa Shipping

D.1.6: Data Management Plan V2

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List of Acronyms

Abbreviation / acronym	Description
API	Application Programming Interface
DMP	Data Management Plan
D1.1	Deliverable number 1 belonging to WP 1
DRF	Django REST Framework
DOI	Digital Object Identifier
EC	European Commission
FAIR	Findable, Accessible, Interoperable, Re-usable
HTTPS	Hypertext Transfer Protocol Secure
IPR	Intellectual Property Rights
LSEIM	Legal, Ethical and Security Issues Manager
MS Teams	Microsoft Teams
NCA	National Competent Authorities
NIS	Network and Information Systems
OES	Operators of Essential Services
ORDP	Open Research Data Pilot
SPOC	Single Points of Contact
WP	Work Package

Executive Summary

This deliverable is presenting the second version of project's Data Management Plan (DMP). DMP is following an iterative approach; thus, periodically updated during the project lifetime, therefore this version constitutes an iteration of the initial presentation of MOSES Data Management Plan recorded in D1.4 (1) submitted in January 2020. The DMP is addressing, on a dataset-by-dataset basis, the data reference name and description, standards and metadata, modalities, and procedures for data sharing, archiving and preservation. This version provides updated related to information on Ethics, Privacy and Confidentiality and where appropriate the procedures which should be implemented, including informed consent and staff recruitment, data collection, storage, access, sharing policies when third countries are concerned, protection, retention and destruction and confirmation, national and international/EU legislation. Any ethical concerns are identified, and appropriate mitigation measures are appropriately taken. The project's Legal, Ethical and Security Issues Manager (LSEIM) will assess the execution of the different ethical requirements within the project in accordance with applicable national and European legislation.

1. Introduction

1.1 Purpose of the document

Data Management Plans (DMPs) are a key element of good data management. A DMP describes the data management life cycle for the data to be collected, processed and/or generated by the MOSES project. MOSES embraces guidelines of Open Research Data Pilot (ORD pilot). The ORD pilot (2) aims to *“improve and maximize access to and re-use of research data generated by Horizon 2020 projects and takes into account the need to balance openness and protection of scientific information, commercialization and Intellectual Property Rights (IPR), privacy concerns, security as well as data management and preservation questions”*.

This document displays and outlines the second version of MOSES data management plan. MOSES DMP is based on EU guidelines on FAIR data management (3) thus making research data findable, accessible, interoperable and re-usable (FAIR).

In this context, purpose of this iteration of the initial MOSES DMP is to display the current available information on datasets, principals, procedures and ethical requirements while presenting any issue or challenge faced up to the time of deliverable write-up and related to the management of data. More specifically in reference to:

- the handling of research data during and after the end of the project
- what data will be collected, processed and/or generated
- which methodology and standards will be applied
- whether data will be shared/made open access and
- How data will be curated and preserved (including after the end of the project).

1.2 Intended readership

DMP outlines open research data pilot principals. Deliverable is open to the public and in this context intended audience is whoever is likely to be interested in the MOSES research data management.

1.3 Document Structure

This document comprises of four main sections: The first section is an iteration of the of the general and guiding principles of MOSES DMP as recorded in D1.4 (1), where FAIR data objectives and data protection and security issues are presented. The second and third section outlines the completed list of datasets to be generated and managed in the MOSES project, including status and challenges recorded up to M18 of the project’s timeline. The last section is dedicated to the ethical background for MOSES DMP.

2. General and Guiding Principals

2.1 Fair data

Good research data management is not a goal in itself, but rather the key conduit leading to knowledge discovery and innovation, and to subsequent data and knowledge integration and reuse (3). In this context, MOSES is embracing principles of FAIR data management under the guidelines of Open access to publications and research data in Horizon 2020 (4) as published by the EC.

MOSES will use MS teams¹ as communication management tool and document repository for project management. All the documents, deliverables and reports produced in the context of the project reside in MS Teams. NTUA is hosting the MS Teams installation, where a dedicated project folder exists for MOSES.

Consortium has considered the best fit solution of a cloud server as dataset repository subject to data driven specific requirements. For that purpose, Zenodo² repository was selected as the most appropriate tool. “Zenodo.org” is open, free, searchable and structured with flexible licensing allowing for storing all types of data: datasets, images, presentations, publications and software. In addition, Zenodo allows researchers to deposit both publications and data, while providing tools to link them.

Considering the above and for sustaining an open access model, MOSES team proceeded with the creation of a MOSES account on the Zenodo platform on M11 (May 2020) (Figure 1). Currently it counts only one poster publication. Zenodo is expected to help MOSES team members to make the research results citable and through the MOSES OpenAIRE account to integrate them into existing reporting lines to funding agencies like the European Commission.

¹ <https://teams.microsoft.com/>

² <https://zenodo.org/>

zenodo Search [] Upload Communities [] Log in [] Sign up []

June 14, 2021 Poster Open Access

Autonomous and interconnected technologies for the container supply chain: The MOSES Concept

Nikolaos P. Ventikos; Konstantinos Louzis; Ioannis Kanellopoulos; Eleni Krikigianni; Evangelia Latsa; Gerco Hagesteijn; Hans Cozijn; Hans van den Broek

The maritime branch of the EU container supply chain is configured as hub-and-spoke networks where large container ships transport cargo to Deep-Sea Shipping (DSS) ports and a limited number of Short Sea Shipping (SSS) feeder lines and container trucks on RoPax vessels distribute cargo to smaller ports for further transhipment. However, economically, environmentally, and socially unsustainable land-based transportation still covers most of the cargo transhipment from Hub ports. MOSES aims to significantly improve the modal shift to SSS by creating sustainable feeder services to small ports that have limited or no infrastructure (Figure 1). This will be achieved by developing the following highly automated/autonomous technologies and integrating them in existing operational processes: i) a digital collaboration and matchmaking platform (MOSES platform), ii) an innovative, green feeder vessel with a robotic container handling system, iii) a manoeuvring and docking scheme where autonomous tugboats collaborate with an automated mooring system.

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Figure 1 MOSES Zenodo account

2.1.1 Making data findable, including provisions for metadata

In line with FAIR Data Principles, the first intent of the MOSES project is to make data Findable. Data come in specific format, conforming to specific rules depending on its intended use (e.g. comma separated fields etc). Documentation files come in common standard file formats (e.g. docx, xlsx, pdf, txt, xml, etc).

Direct association to metadata is supported from specific file types whereas indirect association to metadata stems from external tools, such as configuration control (versioning) or management tools, which support metadata regarding modifications or/and commit information or other actions.

A DOI will be assigned to datasets for effective and persistent citation when it is uploaded to the cloud repository (Zenodo). This DOI can be used in any relevant publications to direct readers to the underlying dataset.

Each dataset generated during the project will be recorded in an Excel spreadsheet with a standard format (xlsx.) and associated with a dataset identifier (see Table 1 below). The spreadsheet will be hosted on the MOSES project management and document repository platform (MS teams). The dataset identifier will be included in

the metadata file at the beginning of the documentation and updated with each version. MOSES naming convention for project datasets will comprise of the following:

- A unique chronological number of the datasets in the project will be added.
- The title of the dataset.
- Each new version of a dataset will be allocated with a version number which will start, for example, at v1.0.
- A prefix "MS" indicating a MOSES dataset.
- Search keywords will be provided when the dataset is uploaded to MS Teams repository which will optimize possibilities for re-use.
- The specific metadata contents, formats, and volume are given in each dataset table (see Section 3) and will be continually updated throughout the project timeline.

Table 1 Dataset Recording Format

Data Set recording format	
Dataset Identifier	<i>The ID allocated using the naming convention</i>
Title of Dataset	<i>The title of the dataset which should be easily searchable and findable</i>
Responsible Partner	<i>Lead partners responsible for the creation of the dataset</i>
Work Package	<i>The associated WP this dataset originates</i>
Dataset Description	<i>A brief description of the dataset</i>
Dataset Benefit	<i>What are the benefits of the dataset in terms of meeting objectives of the project</i>
Dataset Dissemination	<i>Where will the dataset be disseminated</i>
Type Format	<i>This could be DOC, XLSX, PDF, JPEG, TIFF, PPT etc.</i>
Expected Size	<i>The approximate size of the dataset</i>
Source	<i>How/why was the dataset generated</i>
Repository	<i>Expected repository to be submitted</i>
DOI (If Known)	<i>The DOI can be entered once the dataset has been deposited in the repository</i>
Date of Repository Submission	<i>The date of submission to the repository can be added once it has been submitted</i>
Keywords	<i>The keywords associated with the dataset</i>
Version Number	<i>To keep track of changes to the datasets</i>
Metadata	<i>Link to metadata file</i>

2.1.2 [Making data openly accessible](#)

Research data created in the project is owned by the partner who generates it. Each partner should publish results as soon as possible unless there is a legitimate interest to protect the results. A partner who intends to disseminate results must give advance notice to the other partners (at least 45 calendar days) together with sufficient information on the results to be disseminated (5). Research data should be deposited in a cloud research repository (Zenodo) as soon as possible unless a decision has been taken to protect results. Specifically, research data necessary to validate the results in a scientific publication should be deposited in the repository at the same time as publication analysis. Access rights and privacy principles for datasets triggering MOSES functional requirements are considered case by case and displayed in Section 3. Data must be made available to partners upon request, including in the context of checks, reviews, audits or investigations. Data will be made accessible and available for re-use wherever applicable.

As previously stated, MOSES project has chosen to use Zenodo cloud research repository for storing the project Research data (and list its characteristics). All the public data of the project will be openly accessible at the repository. Non-public data will be archived at the repository using the “closed access” option.

In order to maximize the impact of MOSES research data, the project will facilitate sharing the results and deliverables within and beyond the consortium. Selected research data and results will be shared with the scientific community and other stakeholders through publications in high quality scientific journals and presentations at conferences, as well as through open-access data repositories. There will be an open access policy applied to these following the access rights policies as outlined in the project Grant Agreement and project Consortium Agreement. Any sharable and publicly available project result must include an acknowledgment to MOSES to clearly be noted as project production.

2.1.3 [Making data interoperable](#)

Data usually needs to be integrated with other data. Also, data needs to interoperate with applications or workflows for analysis, storage, and processing.

MOSES project aims to collect and document data in a standardized way to ensure that datasets can be understood, interpreted and shared in isolation alongside accompanying metadata and documentation.

MOSES Partners will observe OpenAIRE guidelines for online interoperability, including OpenAIRE Guidelines for Literature Repositories (6), OpenAIRE Guidelines for Data Archive (7), OpenAIRE Guidelines for CRIS Managers (8), based on CERIF-XML.

A metadata file will be created and linked within each dataset. It will include the following information:

- **General Information**
 - Title of the dataset
 - Dataset Identifier
 - Responsible Partner
 - Author Information
 - Date of data collection
 - Geographic location of data collection
 - The title of project and Funding sources that supported the collection of the data
- **Sharing/Access Information**
 - Licenses/access restrictions placed on the data
 - Link to data Repository
 - Links to other publicly accessible locations of the data
 - Links to publications that cite or use the data
 - Was data derived from another source?
- **Dataset/File Overview**
 - This dataset contains X sub-dataset as listed below
 - What is the status of the documented data? – “complete”, “in progress”, or “planned”
 - Are there plans to update the data?
- **Methodological Information**
 - Used materials
 - Description of methods used for experimental design and data collection: <Include links or references to publications or other documentation containing experimental design or protocols used in data collection>
 - Methods for processing the data: <describe how the submitted data were generated from the raw or collected data>
 - Instruments and software used in data collection and processing-specific information needed to interpret the data
 - Standards and calibration information, if appropriate
 - Environmental/experimental conditions
 - Describe any quality-assurance procedures performed on the data
 - Dataset benefits

An example of a metadata file can be found in Annex 1.

2.1.4 [Increase data re-use](#)

The goal of the FAIR principle is to optimise the reuse of data. To achieve this objective, metadata and data should be well-described to be replicated and/or combined in different settings.

As the project progresses and data is identified and collected, further information on increasing data re-use will be processed case by case and include:

- The information on how data will be licensed to permit the widest reuse possible,
- The timing for the data to be made available for re-use,
- Whether the data produced and/or used in the project is useable by third parties,
- A data quality assurance processes complying with standards for data normalization, data format consistency, rigorous data handling principals and comprehensive metadata documentation for data collection, recording and processing.
- Specifications of the duration for which the data will remain re-usable.

In principle, the research data will be stored in the MOSES research repository after the conclusion of the Project at no additional cost. All research data will be of the highest quality, have long-term validity and will be well documented in order for other researchers to be able to have easy access to information.

Datasets updates will be processed by the data owner. Data owner is the responsible partner who will have the obligation to manage the different versions and to make sure that the latest version is available in the case of publicly available data. Quality control of the data is also the responsibility of the partner responsible to handle and manage data end-to-end, throughout project duration.

In addition, search keywords will be provided when the dataset is uploaded to Zenodo cloud research repository, which will facilitate and manage any possibility for data re-use. Zenodo follows the minimum Data Cite metadata standards.

2.2 *IPR management and Security*

Project partners have Intellectual Property Rights (IPR) on their technologies and data, on which their economic sustainability relies. As a result, the owning partner will have to protect these data and consult the concerned partner(s) before publishing data.

Another effect of IPR management is that for any sensitive data collected through project activities all security measures should be taken to prevent any data leak or breach. Hence, all data repositories used by the project will include a secure protection of sensitive data.

A holistic security approach will be undertaken to protect the 3 main pillars of information security: confidentiality, integrity, and availability. The security approach will consist of a methodical assessment of security risks followed by an impact analysis. This analysis will be part of overall project risk management and will be performed on the personal information and data processed by the proposed system, their flows and any risk associated to their processing

All MOSES IPR management principals were described in D1.3 (9), which explicitly portrays the framework of obligations, procedures and policies in reference to access rights, disclosure of information, transfer knowledge, dissemination, publication, background knowledge driven from partners' contribution and the management of the foreground as generated from project results.

2.3 Cyber Security Management

Cyber security management is of major concern for each MOSES innovation. All MOSES technologies are shielded against cyber threats by following best practices.

One of the MOSES innovations that may be vulnerable to a cyber-attack is the MOSES matchmaking platform, as it is the main interface for exchanging data between shipping actors, either cargo owners or service providers. For this reason, a dedicated cyber security management process needs to be followed to avoid any data breach or security incident. MOSES platform implements the Token-based Authentication establishing OAuth mechanism and protocol using Django REST Framework (DRF). Through this protocol, the platform can identify which user makes the requests to the API or which user is logged in to the platform. Based on this, the platform either allows or not the specified requests, depending on the user permissions. These permissions differ depending on the group that each client belongs to and are set in the MOSES backend. The authentication schema above works by exchanging a username and password for a token that will be used in all subsequent requests that the client may make.

More specifically, each token is unique, and represents and identifies a specific client. In parallel, the token must be part of the request headers in order for the application to proceed to the authorization of the user and examine the user's permissions according to the policies that have been set. Regarding the storage security, tokens are kept confidential in storage and are sent over an HTTPS connection, so that it will be assured that the transit is made through a secure channel. This means that all "critical" requests in the API / platform, such as creating, updating or deleting a record, must be made by an authenticated user with proper permissions. On the other hand, non-critical requests in the API, such as displaying a list of transports or trips, do not require an authenticated user. However, even for simpler actions such as searching, the backend interface requires an authenticated user.

In order to define the user permissions, three separate types of groups are identified:

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- the super-users and staff group;
- the Providers group; and
- the Simple Users group.

As it is probably obvious, a super-user has all the permissions to all the actions in the backend and it refers mainly to the administrators of the platform that are responsible for its operation and maintenance. In order to use the MOSES platform, each user must create an account. Once the account is created, this user is part of Simple Users group that can see the Dashboard section, search for a route between locations, place bookings for a route and transport mode and see notifications. Finally, a Simple User can be elevated to a Provider by a super-user or a staff user. The Providers will see additional sections in the backend interface and can make extra actions, such as creating a Transport Mode, adding a new Location, uploading a schedule of itineraries for a specific transport mode etc. Providers have more permissions than Simple users, but of course less permissions than super-users and staff users.

2.4 Personal Data Protection

For some of the activities to be carried out by the project, it may be necessary to collect basic personal data (e.g. full name, contact details, background), even though the project will avoid collecting such data unless deemed necessary. According to regulation 2016/679 of the European parliament and of the council, personal data is defined as *“information relating to an identified or identifiable natural person, directly or indirectly, by reference to an identifier, such as a name, economic, cultural or social identity of that natural person etc.”* (10) On top of that, processing of personal data means any operation, such as collection, recording, organisation, structuring, storage, adaptation or alteration, retrieval, consultation, use, disclosure by transmission, dissemination or otherwise making available by sharing exchanging or transferring, alignment or combination, restriction, erasure or destruction (10).

Such data will be protected in compliance with the EU's Data Protection Directive 95/46/EC (10) aiming at protecting personal data. National legislations applicable to the project will also be strictly followed.

As explicitly stated in deliverable D9.2 (11) *“all of the processed data will be relevant and limited to the purposes of the project following the data minimisation principle. Personal data will be kept for as long as it necessary for the purposes for which they were collected, or in accordance with the established auditing, archiving or retention provisions for each aspect of the project. The MOSES Consortium members will make arrangements that enable the data subjects to exercise their fundamental rights and will use data-protection focused service providers, such as Microsoft Teams for internal collaboration and the EUSurvey platform for questionnaire and survey response management.”*

Moreover, and in reference to MOSES deliverable 9.3 (12) we acknowledge that each consortium member and their research partners must have data protection and information security policies and procedures to ensure the confidentiality, integrity, availability and resilience of processing systems and avoid unauthorised access to or disclosure and accidental deletion or destruction of their data.

Protection measures that will be applied include but not limited to encryption and anonymisation or pseudonymisation. Anonymisation should ideally happen at the point and time at which the data are collected from the research subject, so that no personal data are processed. In any other case, the raw data must be treated as personal; the same applies if there is a significant risk of re-identification of persons whose data have been anonymised.

2.5 Data Protection Certificates

MOSES innovations are directly related to port operations, which under the Directive (EU) 2016/1148 on Security of Network and Information Systems (the “NIS Directive” 3) are Operators of Essential Services [OES(s)]. MOSES innovations activities will be subject to all improvements of internal capabilities of OES(s) to meet security and reporting requirements under national and EU legislation. In accordance with the obligation of OES(s) to take appropriate security measures and to notify serious cyber incidents to the relevant national authority i.e. National Competent Authorities (NCAs)/Single Points of Contact (SPOCs), under the Directive (EU) 2016/1148 on Security of Network and Information Systems (the “NIS Directive” 3), the MOSES innovations will be subject to responding to these requirements and providing the necessary data for the reporting process. Any related data certificates received by OES(s) will also apply to MOSES innovations implemented in the subject ports.

3. Datasets for MOSES Innovations

Various types of data will be collected and generated in MOSES, such as weather data, sea states, sustainable power, emission, logistic data, case studies, simulation and model test results. Also, raw data will be generated in numerical simulations and by means of physical model tests in the demonstrators. Here below, high-level definition of MOSES datasets, to be managed and processed for the successful delivery of MOSES innovations, is displayed. Definition of each dataset comprised of basic data description and overall information on standards and metadata of the dataset in reference. It is worth noticing that in D1.4 (1) an indicative dataset list was presented as defined at this early stage of the project, which is shown in the following section and may be expanded as required during the development of the MOSES innovations. In the second version of DMP, as described in the MOSES Grant Agreement (1), no changes are recorded against D1.4. This non-exhaustive list may be expanded as required during the development of the MOSES innovations.

3.1 Tugboat sensors dataset

3.1.1 Dataset Description

Name of Dataset: "Tugboat sensors dataset"	
Purpose and Relation to the objectives of the project	State identification of autonomous tugboat, and for future replication on a virtual environment
Data Description	Sensors from LIDAR, GPS, accelerometers, steering, thrust, etc.
Responsible Partner(s)	NTUA, TUCO, ESI, CORE

3.1.2 Standards and Metadata

Metadata and Standards	
The following metadata (with indicative values) will be created	timestamps
Author/compiler of data set	NTUA, TUCO, ESI, CORE
Funded by	MOSES H2020 project
Data Type/Format	csv, json, txt, xls
Data Origin/Source	sensors
Estimated size of Data	Unknown at this stage (December 2020)
Accessibility and Privacy Principles	Restricted to involved partners
Method of data accumulation	Streaming/ manual exports/ through APIs/ FTP, etc.

Metadata and Standards	
Data collection period	WP4 and WP7 duration
Related publications (if any)	none

3.2 Virtual environment dataset

3.2.1 Dataset Description

Name of Dataset: “Virtual environment dataset”	
Purpose and Relation to the objectives of the project	To populate the virtual environment with assets of vessels and of the port
Data Description	3D models of vessels, and of the port
Responsible Partner(s)	CORE, ESI, TUCO, NTUA, SAT

3.2.2 Standards and Metadata

Metadata and Standards	
The following metadata (with indicative values) will be created	Material properties
Author/compiler of data set	CORE, ESI, TUCO, NTUA, SAT
Funded by	MOSES H2020 project
Data Type/Format	CAD, STL, OBJ, 3DS, FBX, DXF, etc.
Data Origin/Source	Provided by the partners of the consortium or self-created
Estimated size of Data	Hundreds of megabytes to a few gigabytes
Accessibility and Privacy Principles	Restricted to involved partners
Method of data accumulation	Manual exports
Data collection period	WP4 duration
Related publications (if any)	none

3.3 Simulation results dataset

3.3.1 Dataset Description

Name of Dataset: "Simulation results dataset"	
Purpose and Relation to the objectives of the project	To establish boundary conditions for the virtual environment
Data Description	Results from FEA and CFD simulations
Responsible Partner(s)	ESI, NTUA

3.3.2 Standards and Metadata

Metadata and Standards	
The following metadata (with indicative values) will be created	timestamps
Author/compiler of data set	ESI, NTUA
Funded by	MOSES H2020 project
Data Type/Format	txt, xls, csv, json
Data Origin/Source	FEA and CFD software
Estimated size of Data	a few megabytes
Accessibility and Privacy Principles	Restricted to involved partners
Method of data accumulation	Manual exports
Data collection period	WP4 duration
Related publications (if any)	none

3.4 AI model control logs

3.4.1 Dataset Description

Name of Dataset: "AI model control logs"	
Purpose and Relation to the objectives of the project	To record the behaviour of the AI control system
Data Description	Steering and thrust information
Responsible Partner(s)	CORE

3.4.2 Standards and Metadata

Metadata and Standards	
The following metadata (with indicative values) will be created	Timestamps, Tug ID
Author/compiler of data set	CORE
Funded by	MOSES H2020 project
Data Type/Format	Json, csv, xls
Data Origin/Source	AI control agent
Estimated size of Data	A few megabytes
Accessibility and Privacy Principles	Restricted to involved partners
Method of data accumulation	Software logging components
Data collection period	WP4 and WP7 duration
Related publications (if any)	none

3.5 Feeder design data

3.5.1 Dataset Description

Name of Dataset: “Feeder design data”	
Purpose and Relation to the objectives of the project	During the design of the innovative feeder vessel, data will be created to design, simulate, and verify the performance of the feeder, as well as the capability for autonomous operation
Data Description	Data created in the process of the design of the innovative feeder vessel and the simulations of autonomous operation
Responsible Partner(s)	MARIN

3.5.2 Standards and Metadata

Metadata and Standards	
The following metadata (with indicative values) will be created	Ship drawings, technical performance figures
Author/compiler of data set	MARIN
Funded by	MOSES H2020 project
Data Type/Format	numerical/text/Word and Excel format/csv/3DM/IGES/DWG
Data Origin/Source	external public databases, own generation
Estimated size of Data	0.5 TB
Accessibility and Privacy Principles	Restricted to Owner
Method of data accumulation	through API
Data collection period	M6-M24
Related publications (if any)	Not available

3.6 Demonstrator Innovative Feeder

3.6.1 Dataset Description

Name of Dataset: “Demonstrator Innovative Feeder”	
Purpose and Relation to the objectives of the project	The data set will be created during the demonstration pilot of the innovative feeder
Data Description	The data set contains measurement data of the model tests
Responsible Partner(s)	MARIN

3.6.2 Standards and Metadata

Metadata and Standards	
The following metadata (with indicative values) will be created	Sensor and video data recordings of model test and data analysis results
Author/compiler of data set	MARIN
Funded by	MOSES H2020 project
Data Type/Format	HDF5, RAW, PDF, Word format
Data Origin/Source	Own generation
Estimated size of Data	2 TB
Accessibility and Privacy Principles	Restricted to Owner
Method of data accumulation	Sensor and video data recording
Data collection period	M25-M34
Related publications (if any)	Pilot 2, demonstrator event 2023

3.7 User Accounts

3.7.1 Dataset Description

Name of Dataset: "User Accounts"	
Purpose and Relation to the objectives of the project	Develop the MOSES Matchmaking Logistics Platform in the context of WP6
Data Description	Details about the platform's users
Responsible Partner(s)	NTUA

3.7.2 Standards and Metadata

Metadata and Standards	
The following metadata (with indicative values) will be created	username, first name, last name, email, company, role
Author/compiler of data set	Data provider/Author
Funded by	MOSES H2020 project
Data Type/Format	text
Data Origin/Source	Platform users
Estimated size of Data	MBs
Accessibility and Privacy Principles	Restricted personal data
Method of data accumulation	manual
Data collection period	M10-M24
Related publications (if any)	Not available

3.8 Transport Schedules

3.8.1 Dataset Description

Name of Dataset: “Transport Schedules”	
Purpose and Relation to the objectives of the project	Develop the MOSES Matchmaking Logistics Platform
Data Description	Sea, rail, road transport service schedules
Responsible Partner(s)	NTUA

3.8.2 Standards and Metadata

Metadata and Standards	
The following metadata (with indicative values) will be created	Mode (sea, rail, road), from, to, departure time, duration, capacity
Author/compiler of data set	Shipping operators, freight forwarders
Funded by	MOSES H2020 project
Data Type/Format	Text/numerical
Data Origin/Source	Shipping operators, freight forwarders
Estimated size of Data	MBs
Accessibility and Privacy Principles	Open free Public access
Method of data accumulation	manual
Data collection period	M10-M24
Related publications (if any)	Not available

3.9 Development Order Details

3.9.1 Dataset Description

Name of Dataset: “Development Order Details”	
Purpose and Relation to the objectives of the project	Develop the MOSES Matchmaking Logistics Platform
Data Description	Order Details
Responsible Partner(s)	NTUA

3.9.2 Standards and Metadata

Metadata and Standards	
The following metadata (with indicative values) will be created	UN/EDIFACT Message COPARN Release: 01A (unece.org) (15)
Author/compiler of data set	Not available
Funded by	MOSES H2020 project
Data Type/Format	text
Data Origin/Source	freight forwarders, might also have to generate dummy data
Estimated size of Data	GBs
Accessibility and Privacy Principles	Restricted to Owner
Method of data accumulation	manual exports/ through APIs
Data collection period	M10-M24
Related publications (if any)	Not available

3.10 Business Case Order Details

3.10.1 Dataset Description

Name of Dataset: “Business Case Order Details”	
Purpose and Relation to the objectives of the project	Develop the MOSES Matchmaking Logistics Platform
Data Description	Order Details
Responsible Partner(s)	NTUA

3.10.2 Standards and Metadata

Metadata and Standards	
The following metadata (with indicative values) will be created	UN/EDIFACT Message COPARN Release: 01A (unece.org) (15)
Author/compiler of data set	Not Available
Funded by	MOSES H2020 project
Data Type/Format	text
Data Origin/Source	Will be provided by the open call beneficiary
Estimated size of Data	GBs
Accessibility and Privacy Principles	Restricted to Owner
Method of data accumulation	manual exports/ through APIs
Data collection period	M10-M24
Related publications (if any)	Not Available

3.11 Robotic container handling system

3.11.1 Dataset Description

Name of Dataset: “Robotic container handling system: 3D-world model and remote supervisory control”	
Purpose and Relation to the objectives of the project	For the development of the Robotic Container Handling system both a 3D-world model and a remote-control station need to be developed (WP3). In addition, data will be collected during the pilot demonstration (WP7).
Data Description	Data created and collected during the design and evaluation of both the 3D-world model and the remote-control station. These data will consist of camera recordings (.avi), other (remote) sensing data (such as Lidar ³), algorithms, outcomes of interviews and / or surveys.
Responsible Partner(s)	TNO

3.11.2 Standards and Metadata

Metadata and Standards	
The following metadata (with indicative values) will be created	Collection date (YYYY.MM.DD) Role of respondent (interview / survey), or, type of test run / experiment
Author/compiler of data set	TNO
Funded by	MOSES H2020 project
Data Type/Format	.doc / .xls / .avi / LAS / other formats for relevant system parameters
Data Origin/Source	During the development phase we will mainly generate data ourselves and mainly at a TNO site. During the pilot demonstration we will also generate data at the site of MacGregor. When relevant we will use external public data bases (e.g. LIDAR, google maps) Interviews will be held either online or face-to face (in line with actual covid-19 regulations).
Estimated size of Data	Unknown at this stage (December 2020)
Accessibility and Privacy Principles	Data is restricted to owner i.e. TNO, except for data gained from external public data bases. Where integration is necessary for the functioning of the Robotic Crane, data will be exchanged with other components of the robotic container-handling system. These components will be developed by MacGregor (i.e. exchange through API). To involve end-users in the design (WP3) and evaluation (WP7) of the robotic crane, interviews and /or surveys will

³ LIDAR stands for **L**ight **D**etection **A**nd **R**anging of **L**aser **I**maging **D**etection **A**nd **R**anging

Metadata and Standards	
	be executed. These data will be collected in line with GDPR compliance. Data from owner will be stored on TNO-servers.
Method of data accumulation	Camera's, sensors, AI-model, through APIs, interview(s), survey.
Data collection period	M6 – M32
Related publications (if any)	We intend to publish in peer-reviewed journals about the development of the system and outcomes of the demo. If data of the interviews or survey are used in these publications, these data will be pseudonymised or anonymised.

3.12 Trial Demo Data

3.12.1 Dataset Description

Name of Dataset: "Trial Demo Data"	
Purpose and Relation to the objectives of the project	Purpose of Trials for demonstration of MOSES technologies and goals
Data Description	Documents, sensory data, photographs, video, data on equipment data.
Responsible Partner(s)	ESI, ALL

3.12.2 Standards and Metadata

Metadata and Standards	
The following metadata (with indicative values) will be created	Trial data, Video, Photographs
Author/compiler of data set	ALL
Funded by	MOSES H2020 project
Data Type/Format	txt, xls, csv, json, docx, jpeg, png, mp4, avi, (video and photo format)
Data Origin/Source	Tub boat, Crane and Docking trials
Estimated size of Data	A few megabytes to gigabytes
Accessibility and Privacy Principles	Available to the consortium
Method of data accumulation	Recording data from sensors and audio-visual material
Data collection period	WP7 duration
Related publications (if any)	none

3.13 Datasets report

As already noted in paragraph 2.1.1, each dataset that is generated during the project as product of MOSES innovations and overall project work is recorded in an excel spreadsheet with a standard format (xlsx.) and associated with a dataset identifier. Metadata of dataset recording is displayed in Table 1. The current dataset recording status reported in a spreadsheet hosted on the MOSES project management and document repository platform (MS team) is presented in Annex 2. During the second half of the project (after M18), the datasets that will have been created will be evaluated for the possibility of publication in the Zenodo repository.

4. Challenges and Issues registered up to M18

There are no issues or challenges recorded in reference to data management up to M18 of the project timeline.

This is mainly attributed to the fact that technology innovations of MOSES are in design phase or in the first stage of development. No data has been intensively processed or managed so far. Any risk associated with data management in terms of storage, security, collection, processing and re-usability is registered, assessed and controlled in the consolidated MOSES risk registry documented and configured in project's cloud project management tool (MS Teams). In the MOSES risk registry, potential risk events are recorded, qualitatively evaluated, and prioritized in terms of impact and likelihood to occur. Updates in risk registration and evaluation are constantly performed. Risks are linked with each WP and MOSES innovation/technology and response plans are allocated and monitored by assigned risk owners.

Issues or challenges will be further logged and managed throughout the project work plan. A full updated report on the issues, risks and challenges for data management will be presented in the respective deliverables of WP7 dedicated to the demonstration and evaluation of each MOSES innovation

5. Ethical Requirements

In the context of WP9, MOSES ethical requirements have been explicitly described in deliverables 9.1 (13), 9.2 (11) and 9.3 (12). Ethical framework in MOSES set outs obligations, procedures and principals in reference to the coordination and collection of data stemming from workshops, focus groups, interviews, surveys and questionnaires as well as the trials and demonstrators which will involve personnel from partner's organizations. The ethics code in MOSES also incorporates all obligations related to the protection of personal data and outlines the health and safety procedures which must be followed by the staff taking part in pilot demonstration

MOSES DMP is aligned with the MOSES ethical framework and fully complies with applicable legislative and regulatory policies.

The MOSES Legal, Ethical and Security Issues Manager (LSEIM) will be responsible for assessing the execution of the legal and ethical requirements within the project, in accordance with applicable national and European legislation; a non-exhaustive list is given in Table 2. The MOSES LSEIM will also oversee and record all potential ethical issues, arising from the development of the MOSES innovations.

Table 2 Legislative and Regulatory Framework

International
Universal Declaration of Human Rights (16)
European Union
Charter of Fundamental Rights of the European Union (17)
European Convention on Human Rights (18)
General Data Protection Regulation (10)
Horizon 2020 - Regulation of Establishment: Ethical principles (Article 19) (19)
Horizon 2020 - Rules for Participation: Ethics Reviews (Article 14) (20)
National
<u>Spain</u> Organic Law 3/2018, of December 5, on the Protection of Personal Data and the Guarantee of Digital Rights. https://www.boe.es/eli/es/lo/2018/12/05/3/con
<u>Greece</u> Personal Data Protection Authority, Implementing the General Data Protection Regulation (Regulation (EU) 2016/679) and Transposing into National Law Data Protection Directive with Respect to Law Enforcement (Directive (EU) 2016/680) and Other Provisions. https://www.dpa.gr/APDPXPortlets/htdocs/documentSDisplay.jsp?docid=66,121,83,229,125,127,247,242

6. Conclusions

This document, which is the second version of the MOSES Data Management Plan (DMP V1), delivered a presentation of how data is handled during the life cycle of the project. In this document, a definition of principals, standards, methodologies for data processing, application, re-usage, storing, accessibility and preservation was given. IPR and security issues of data privacy and protection were covered while an alignment of DMP plan with MOSES ethical framework was processed. Also, a descriptive, but non exhaustive list of basic datasets for MOSES research/innovation results was displayed.

Against the first version of the DMP as reported in D1.4 (1), this version includes a cyber-security management description for MOSES innovations, data protection certificates framework and an updated report on datasets status and issues recorded in data management.

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Annex 1: Example of METADATA file template

This metadata file was generated on <insert date> by <insert name>

GENERAL INFORMATION

1. Title of Dataset:
2. Dataset Identifier in Repository:
3. Responsible Partner:
4. Author Information:
 - a. Investigator Contact Information: Name / Email
 - b. Supervisor Contact Information: Name / Email
 - c. Co-Supervisor Contact Information: Name / Email
5. Date of data collection:
6. Geographic location of data collection (where was data collected?):
7. The title of project and Funding sources that supported the collection of the data:

SHARING/ACCESS INFORMATION

1. Licenses/access restrictions placed on the data:
2. Link to data Repository:
3. Links to other publicly accessible locations of the data:
4. Links to publications that cite or use the data:
5. Was data derived from another source?
6. If yes, list source(s):

DATASET & FILE OVERVIEW

1. This dataset contains X sub-dataset as listed below:
 - a. Datasheet name:
 - b. Datasheet name:
 - c. Datasheet name:
 - d. Datasheet name:
2. What is the status of the documented data? – “complete”, “in progress”, or “planned”
3. Are there plans to update the data?

METHODOLOGICAL INFORMATION

1. Used Materials:
2. Description of methods used for experimental design and data collection: <Include links or references to publications or other documentation containing experimental design or protocols used in data collection>
3. Methods for processing the data: <describe how the submitted data were generated from the raw or collected data>

D.1.6: Data Management Plan V2

4. Instruments and software used in data collection and processing-specific information needed to interpret the data:
5. Standards and calibration information, if appropriate:
6. Environmental/experimental conditions:
7. Describe any quality-assurance procedures performed on the data:
8. Dataset Benefit:

Annex 2: Dataset Recording Status

DATA ID	TITLE OF DATASET	RESP. PART.	WP/TASK	DATASET DESCRIPTION	DATASET BENEFIT	DATASET DISSEMIN.	TYPE FORMAT	EXP. SIZE	SOURCE	REP.	DOI	DATE OF REP. SUBM.	KEY-WORDS	VER.
D01	User surveys	NTUA/ SEAB/ CORE/ CIRCLE	WP2/ WP8	Stakeholders/end users survey responses	To collect stakeholder's and end users' viewpoints, opinions and feedback	Datasets row data are not disseminated directly, but after being processed	Docx, xlxs	3 MB	Datasets originated after distributing the surveys, using the appropriate tools (e.g. Google, forms, or in-project questionnaires etc)	MS Teams	N/A	N/A	N/A	N/A
D02	Virtual environment dataset	CORE	WP4/ T4.2	The dataset consists of: - unity 3D model of the port - unity 3D models of the tugboats - unity 3D model of the container (mother) vessel	The 3D port layout and the 3D models of the vessels are part of deliverables D4.2 and D4.3. The telemetry data are required for the calibration of the training environment of T4.2 and the training of the AI algorithms of T4.3.	Internal, no Publication	.CSV, .OBJ	~10 GB	To develop a 3D environment simulating the docking of a large containership	Git, and MS Teams	N/A	N/A	3D models, Telemetry, Unity, Tugboat, Container	NA
D03	Transport modes' schedules	NTUA	WP6/ T6.2	Indicative yearly schedules per transport mode	Utilized for searching available optimal routes satisfying transport requests, plus identifying pertinent matching opportunities between them.	NA	Each transport mode's route is contained in a csv file with three columns, i.e. Location, Arrival Date,	~4MB	Basic information was obtained from the websites of respective shipping companies and information	Indicative: Kaggle or github repositories (TBD).	N/A	N/A	ship schedules, train schedules	NA

DATA ID	TITLE OF DATASET	RESP. PART.	WP/TASK	DATASET DESCRIPTION	DATASET BENEFIT	DATASET DISSEMIN.	TYPE FORMAT	EXP. SIZE	SOURCE	REP.	DOI	DATE OF REP. SUBM.	KEY-WORDS	VER.
							Departure Date.		provided by the port of Piraeus. Further enriched/synthesized to resemble a set of indicative, yet realistic shipping schedules.					
D04	Robotic container handling system: 3D-world model and remote supervisory control	TNO	WP3/T3.3	The dataset consists of three main categories: - unity generated 3D model - video recordings of parking place with objects (as part of test database) - data from a user evaluation study	The 3D world model is (part of) deliverable D3.3. The video recordings form input for testing different visualisations. The user evaluation study is one of the testing methods for different visualisations.	No raw data will be disseminated. The unity generated 3D world model will be published as deliverable D3.3, which has the status Confidential. The results of the user evaluation study might become part of a peer reviewed conference presentation or paper.	Diverse, including .avi., .xls, .LAS, .doc.	N/A	To develop a 3D world model for the Container Handling System.	Relevant data of the 3D world model will be submitted via D3.3.	N/A	N/A	3D world model	NA
D05	User registration data	SEAB	WP8	User registration data associated with newsletter subscription and participation to project events	Boosting MOSES outreach by communicating the project progress to interested stakeholders	Data regarding the subscribers and events' participants will not be	Electronic lists	N/A	The dataset is generated automatically when a subscriber signs up using	Lists will be not submitted to any other repository	N/A	N/A	N/A	N/A

DATA ID	TITLE OF DATASET	RESP. PART.	WP/TASK	DATASET DESCRIPTION	DATASET BENEFIT	DATASET DISSEMIN.	TYPE FORMAT	EXP. SIZE	SOURCE	REP.	DOI	DATE OF REP. SUBM.	KEY-WORDS	VER.
						disseminated. The subscribers' list is a list in mailchimp platform, while the event's participant list is a list in eventbride platform			the subscription form, available in the MOSES website and when a user wants to register in a MOSES event (e.g. Focus Groups) using the eventbride platform	es than the ones generated				
D06	Survey Participant data	CORE	WP8/T8.4	Participant registration data on EU survey platform related with market and societal end user needs	Identification of Market and Societal characteristics of MOSES End-Users (Port Authorities, Shipping Companies, Tugboat Owners, Terminal Operators)	No publication. Data will be presented only in D8.7 confidential report.	xls.	20KB	Data was created automatically via EU Survey platform and rearranged by CORE to statistical charts	MS Teams	N/A	N/A	market, societal, end-user, port authority, shipping, tugboats, needs, pains, gains	N/A
D07	Hydrodynamic and structural simulations data	ESI	WP4/T4.2	ANSYS Workbench generated data related with hydrodynamic simulations and structural behaviour of ship objects	These data provide input for feeding the AI algorithm of the tugboats	No publication. Data will be presented only in D4.2 confidential report.	.wbpj	~4GB	ANSYS Workbench	Data will be not submitted to any other repositories than the ones generated	N/A	N/A	hydrodynamic and structural simulations	N/A