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ABSTRACT

The Data Management Plan (DMP) for the OVERHEAT project defines the principles and procedures for handling all data generated, collected, and processed during the project lifecycle. It outlines the management of data throughout the research and development phase and specifies the arrangements for storage and accessibility once the project concludes. The plan follows the **FAIR principles** (Findable, Accessible, Interoperable, and Reusable) established in the Horizon 2020 guidelines [1]. Chapters 1–6 of the Horizon 2020 annex are addressed in detail across chapters 2–7 of this document.

The DMP provides a thorough account of data-sharing practices, considering partner constraints, intellectual property rights (IPR), legal frameworks, licensing conditions, and ethical responsibilities. Data produced within OVERHEAT will include both **qualitative** and **quantitative** components. Qualitative data will stem from interview transcripts, survey and questionnaire responses. Quantitative data will be collected through IoT sensors, UAS and validation exercises (both RTS and demonstrations), and other technological tools.

In line with ethical and legal standards governing personal data dissemination, publicly accessible datasets will be restricted to project deliverables and reports containing anonymized summaries, along with research outputs such as journal articles, conference papers, and presentation materials.

This document is not intended as a final report but rather as a living framework. The DMP will be updated progressively to incorporate more detailed information as the project evolves and significant changes occur. Updates to data sources and results will be integrated into the iterative dataset delivery process. Consequently, this deliverable (D1.2) represents the initial version of the DMP, while the final version will be issued at the project's conclusion, reflecting deliverable D.1.3.



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ACRONYMS

Acronym	Definition
CA	Consortium Agreement
DMP	Data Management Plan
DS	Digital Solution
EB	Executive Board
GA	Grant Agreement
HIL	humans-in-the-loop
KPIs	Key Performance indicators
PC	Project Coordinator
PCC	Project Coordination Committee
PDM	Project Dissemination Manager
PMP	Project Management Plan
QAP	Quality Assurance Plan
RMP	Risk Management Plan
SC	Safety Culture
SoA	State-of-the-Art
SSB	Stakeholder Support Board
TLs	Task Leaders
UCs	Use Cases
WBS	Work Breakdown Structure
WPs	Work Packages
WPLs	Work Package Leaders

Table 1: Acronyms



1 – Introduction

1.1 – Purpose of the document

The Data Management Plan (DMP) for the OVERHEAT project establishes comprehensive guidelines for the management of all data generated, collected, and processed throughout the project. It outlines the procedures for handling data during the research and development phases, while also specifying the strategies for long-term storage and accessibility following the project's completion.

The DMP reflect the structure in accordance with the FAIR principles (Findable, Accessible, Interoperable, and Reusable) as defined under Horizon 2020 [5], as already declared during the proposal phase.

1.2 – Scope

The DMP outlines the meta-characteristics of the data sources to be utilized within the OVERHEAT project. These sources encompass those initially envisaged, as well as those that may be supplemented or excluded in subsequent dataset iterations. The datasets will be administered for purposes of validation, reusability, dissemination, and demonstration.

The DMP has been formulated with particular attention to the following considerations:

- the procedures for handling data during the project and after its completion,
- the types of data to be collected, processed, and/or generated,
- the methodologies and standards to be applied,
- the extent to which data will be shared or made openly accessible, and
- the strategies for data curation and long-term preservation, including beyond the project's conclusion.

DMP ensures that research data provided by the OVERHEAT project are findable, accessible, interoperable, and reusable. The plan encompasses information regarding:

- the identification of data collected and generated,
- the management of research data employed as project inputs,
- the methodologies and standards applied, and
- the conditions under which data will be shared or made openly accessible.

1.3 – Structure of the document

This document includes only 2 chapters as well as Abstract and conclusions. Below are reported more details related to:

- Section 1, which introduces the document purpose and scope;
- Section 2, includes the FAIR data approach for the OVERHEAT project;
- ANNEX, providing DMP issues to be addressed by the project.



2 – FAIR data Approach

This document uses the FAIR DMP template that has been designed to be applicable to any Horizon project that produces, collects or processes research data.

The **FAIR principles** is used to make all research results such as (but not limited to) research data, software and protocols **F**indable, **A**ccessible, **I**nteroperable and **R**eusable.

FINDABLE

To begin with, data must be readily discoverable by both humans and machines. This objective can be achieved through the provision of comprehensive and well-structured metadata, such as labels specifying the author, title, date, and provenance, and by assigning unique, persistent identifiers, including stable URLs, DOIs, or handles, which ensure that each resource remains permanently accessible and identifiable.

ACCESSIBLE

Data and metadata must be accessible, which does not necessarily imply that they are “open.” Accessibility refers to the ability to locate and, where appropriate, download data through universally applicable, open, and free protocols. In certain cases, authentication and authorization procedures or confidentiality agreements may be required.

The overarching principle is “*as open as possible, as closed as necessary*”, depending on specific requirements such as the protection of sensitive information or intellectual property. Accordingly, some FAIR data may remain restricted for security or privacy reasons.

Metadata play a crucial role in indicating the need for particular transmission protocols (beyond standard HTTP) or the availability of an Application Programming Interface (API). Ideally, to ensure accessibility, data should be stored in non-proprietary, uncompressed, and unencrypted formats that adhere to documented standards.

INTEROPERABLE

Data should be documented in accordance with standards that are recognized and widely adopted within the relevant community. An important resource in this regard is the FAIRsharing register, a curated and authoritative repository providing comprehensive information on data and metadata standards, and their interconnections with databases and data policies.

REUSABLE

The overarching objective of the FAIR principles is to maximize the potential for data reuse. To this end, both metadata and data must be thoroughly and accurately described, enabling replication and/or integration across diverse contexts. Furthermore, datasets should be accompanied by a clear and accessible usage license (such as those provided under Creative Commons) with tools like the License Selector serving as valuable aids in determining the most appropriate licensing framework.



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For each of the proposed category, the project intends to provide detailed information.

This tables provides a summary of the Data Management Plan (DMP) issues to be addressed, as outlined in Annex I of the FAIR principles. In the following tables have been reported the questions provided by FAIR principles, and answered based on the OVERHEAT information:

2.1 Data Summary

Table 2 - DATA SUMMARY

FAIR Question	OVERHEAT approach
<p>What is the purpose of the data collection/generation and its relation to the objectives of the project?</p>	<p>Data collection will be undertaken to facilitate the derivation of requirements and to validate the concepts developed within the OVERHEAT project. To this end, both qualitative and quantitative datasets will be acquired. Qualitative data will encompass interview transcripts with research participants, responses to surveys and questionnaires. Quantitative data will be generated through IoT sensors, data from the validation platforms, UAS and validation exercises, and other technological instruments. The collection of personal data will be strictly limited to the following categories:</p> <ul style="list-style-type: none"> • Professional affiliation, age range, and contact information. • Personal and professional perspectives and experiences. • Photographs, audio, and/or video recordings documenting participation in OVERHEAT research activities (e.g., records of discussions during workshops or demonstrations). <p>However, for that purpose, the project prepared a consent form that will be submitted to all the participants in order to acknowledge their allowance to take pictures or to record video. Particularly with the members of the Stakeholder Support Board.</p>



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<p>What types and formats of data will the project generate/collect?</p>	<ul style="list-style-type: none"> • Deliverables and meeting minutes as DOC/DOCX/PDF • Project schedule as XLS/XLSX • Informed consent forms on paper • Presentations and publications as PPT/PPTX/PDF • Video files e.g. as MPEG-4, AVI, MOV • Audio files e.g. as MP3 • Transcriptions of video and audio files as DOC/DOCX/XLS/XLSX/PDF • Data analysis as Excel/planner
<p>Will you re-use any existing data and how?</p>	<p>Publicly accessible data originating from other research projects within the same field will be utilized. Such data are primarily made available through websites and public deliverables.</p>
<p>What is the origin of the data?</p>	<p>The collected data originate from both qualitative and quantitative sources. Qualitative data will encompass interview transcripts with research participants, responses to surveys and questionnaires. Quantitative data will be generated through IoT sensors, data from the validation platforms, UAS and validation exercises, and other technological instruments.</p>
<p>What is the expected size of the data?</p>	<p>The expected size of the collected data taking into account audio, video, sensors data, interview, survey will be around 1 TB. Of course, these data will be used in order to elaborate the simulations and demonstrations analysis. So, since the data that are made publicly available will mostly be in PDF, the expected size of the data will be about 10GB.</p>
<p>To whom might it be useful ('data utility')?</p>	<p>In addition to its application within the OVERHEAT project, as outlined in the description of its objectives, the generated data will serve as a valuable resource for further research initiatives, regulatory bodies (e.g., IMO, EMSA), and industries engaged in the</p>



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	development of firefighting systems and related technologies.
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2.2 Making data findable, including provisions for metadata

Table 3 - Making data findable, including provisions for metadata

FAIR Question	OVERHEAT approach
Are the data produced and/or used in the project discoverable with metadata, identifiable and locatable by means of a standard identification mechanism (e.g. persistent and unique identifiers such as Digital Object Identifiers)?	Publications of the OVERHEAT project will have a Digital Object Identifier (DOI) and will have keywords.
What naming conventions do you follow?	OVERHEAT_Dx.x_DeliverableName.pdf/word with Dx.x = Deliverable number according to Grant Agreement. Version numbers are included in the document properties and visible on the first page of the document and will thus not be included in the file name.
Will search keywords be provided that optimize possibilities for re-use?	Publications of the project will have keywords.
Do you provide clear version numbers?	Version numbers are incorporated into the document properties and displayed on the first page. The submitted deliverable will, by default, bear the initial version number 00.01.00, which will be updated as necessary in the event of subsequent iterations or re-submissions
What metadata will be created? In case metadata standards do not exist in your discipline, please outline what type of metadata will be created and how.	Any metadata embedded in created materials, such as images, will be removed unless deemed essential for the intended purpose.



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2.3 Making data openly accessible

Table 4 - Making data openly accessible

FAIR Question	OVERHEAT approach
Which data produced and/or used in the project will be made openly available as the default? If certain datasets cannot be shared (or need to be shared under restrictions), explain why, clearly separating legal and contractual reasons from voluntary restrictions.	Deliverables marked as “Public” will be uploaded to the OVERHEAT website by default.
How will the data be made accessible (e.g. by deposition in a repository)?	<p>Public deliverables will be uploaded to the OVERHEAT website, on EU Funding & Tenders Portal, and on CORDIS (Community Research and Development Information Service), the research repository of the European Commission for Horizon 2020 projects. Scientific papers and journal articles based on the project work will be publicly available from the dissemination and publicity companies. For all research publications web links will be provided on the project website.</p> <p>In addition, for project-internal sharing and collaboration of data, a secure repository within the consortium has been established, through sharepoint provided by Microsoft.</p>
What methods or software tools are needed to access the data?	A web browser will be required to access the OVERHEAT website, and a PDF reader will be required to open the available public deliverables.
Is documentation about the software needed to access the data included?	The website will state the necessity of a PDF reader to access the files and include a link to suitable software. This PDF reader software comes with documentation on usage.
Is it possible to include the relevant software (e.g. in open source code)?	This is not possible or foreseen.



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<p>Where will the data and associated metadata, documentation and code be deposited? Preference should be given to certified repositories which support open access where possible.</p>	<p>Public deliverables will be deposited on the project website, the EU Funding & Tenders Portal, and CORDIS. Research publications will be made accessible via web links directing to the respective platforms from which the publications may be downloaded.</p> <p>Data that are not intended for public release will be stored in a secure online repository (SharePoint), hosted by Microsoft and administered by IMAT.</p>
<p>Have you explored appropriate arrangements with the identified repository?</p>	<p>The project website includes a dedicated section for project outputs. Within this section, four categories of materials are identified as accessible to the general public for reading and download: public deliverables, scientific and outreach papers, dissemination materials, and newsletters.</p> <ul style="list-style-type: none"> • Public deliverables will be stored on the project website and made available for download upon approval by the European Commission. • Scientific and outreach papers will be accessible once published, preferably through links directing to the platforms where the papers are hosted. • Dissemination materials (including brochures, posters, leaflets, videos, and similar resources) will be made available immediately upon release by the project. • Project newsletters will be publicly accessible as soon as they are distributed to recipients. <p>The repository will remain online and publicly accessible throughout the duration of the project and for a minimum of two years following its completion.</p>



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<p>If there are restrictions on use, how will access be provided?</p>	<p>There are no restrictions to the access of public deliverables. Access to project confidential data will only be provided to members of the OVERHEAT consortium through Microsoft share point using a specific password.</p>
<p>Is there a need for a data access committee?</p>	<p>The Dissemination Level has been determined in the Grant Agreement for all deliverables, therefore no data access committee is needed.</p>
<p>Are there well described conditions for access (i.e. a machine-readable license)?</p>	<p>Access to project confidential data will only be provided to members of the OVERHEAT consortium through Microsoft share point using a specific password.</p>
<p>How will the identity of the person accessing the data be ascertained?</p>	<p>Data that is not publicly available will be stored on the Microsoft sharepoint managed by IMAT. The platform is only accessible with a personalized account, related to only consortium members, upon request. The personalized account is protected by username and password.</p>

2.4 Making data interoperable

Table 5 - Making data interoperable

<p>FAIR Question</p>	<p>OVERHEAT approach</p>
<p>Are the data produced in the project interoperable, that is allowing data exchange and re-use between researchers, institutions, organisations, countries, etc. (i.e. adhering to standards for formats, as much as possible compliant with available (open) software applications, and in particular facilitating re-combinations with different datasets from different origins)?</p>	<p>Qualitative data obtained through questionnaires and similar instruments are inherently interoperable. By contrast, quantitative data may vary in representation depending on the technologies employed in their generation. For instance, data produced by IoT sensors, UAS and simulation tools may differ in format, file extensions, and related characteristics.</p>
<p>What data and metadata vocabularies, standards or methodologies will you follow to make your data interoperable?</p>	<p>In order to facilitate the utilization of qualitative and quantitative data collected within OVERHEAT, a vocabulary of well-defined technical terms and related definition will be</p>



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	created to harmonize the content of all project deliverables. Furthermore, each deliverable will provide in the beginning a table with acronyms.
Will you be using standard vocabularies for all data types present in your data set, to allow inter-disciplinary interoperability?	OVERHEAT project will also create a deliverable named OVERHEAT ontology in which will define a standard vocabulary for the proposed concept.
In case it is unavoidable that you use uncommon or generate project specific ontologies or vocabularies, will you provide mappings to more commonly used ontologies?	Yes, D5.4 OVERHEAT ontology will serve in this sense

2.5 Increase data re-use (through clarifying licences)

Table 6 - Increase data re-use (through clarifying licences)

FAIR Question	OVERHEAT approach
How will the data be licensed to permit the widest re-use possible?	The published data will be explicitly made available for re-use. In case a specific license is required, a license which minimizes the impact on IPR and re-use will be chosen.
When will the data be made available for re-use? If an embargo is sought to give time to publish or seek patents, specify why and how long this will apply, bearing in mind that research data should be made available as soon as possible.	Public data will be re-useable upon publication and no embargoes are planned or foreseen.
Are the data produced and/or used in the project useable by third parties, in particular after the end of the project? If the re-use of some data is restricted, explain why.	The public deliverables and the links to research publications will remain on the project website until it will be closed.
How long is it intended that the data remains re-usable?	Public data will remain re-usable with no time limit. Confidential data stored on the sharepoint will be ensured to be anonymized at the end of the project and remain re-usable for 2 years thereafter



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Are data quality assurance processes described?	Yes, the D1.5 describe the quality assurance of the OVERHEAT project
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2.6 Allocation of resources

Table 7 - Allocation of resources

FAIR Question	OVERHEAT approach
What are the costs for making data FAIR in your project?	All costs for making data FAIR are included in the project's budget.
How will these be covered? Note that costs related to open access to research data are eligible as part of the Horizon 2020 grant (if compliant with the Grant Agreement conditions).	The consortium partners will cover the costs using dedicated budget.
Who will be responsible for data management in your project?	The Project Coordinator will assume responsibility for overseeing the data management process, while the Project Management Board will serve as the ultimate decision-making authority within the Consortium, tasked with adopting major strategic decisions regarding data management when required. The effort devoted to coordinating the data management process will be incorporated into the Coordinator's WP1 activities.
Are the resources for long term preservation discussed (costs and potential value, who decides and how what data will be kept and for how long)?	The resources for long term preservation are allocated to the coordinating partner, i.e., IMAT. Data will be preserved for 2 years after the end of the project.

2.7 Data security

Table 8 - Data security

FAIR Question	OVERHEAT approach
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What provisions are in place for data security (including data recovery as well as secure storage and transfer of sensitive data)?	The Sharepoint, which is used to distribute and host data, is a user/password protected site with rights management, only available to consortium partners.
Is the data safely stored in certified repositories for long term preservation and curation?	Data will be stored on Microsoft servers managed by IMAT for 2 years after conclusion of the project, i.e. until 31.12.2028

2.8 Ethical aspects

Table 9 - Ethical aspects

FAIR Question	OVERHEAT approach
Are there any ethical or legal issues that can have an impact on data sharing? These can also be discussed in the context of the ethics review. If relevant, include references to ethics deliverables and ethics chapter in the Description of the Action (DoA).	Data collected during validation activities, experiments, and tests will be pseudonymized prior to processing and storage within the SharePoint repository. Personal data of research participants will be documented in a file accessible exclusively to the Exercise Leaders. All participants will receive an information sheet and will be required to sign an informed consent form before engaging in any project-related activities. Consequently, no ethical or legal concerns are anticipated.
Is informed consent for data sharing and long-term preservation included in questionnaires dealing with personal data?	Yes

2.9 Other issues

Table 10 - Other issues

FAIR Question	OVERHEAT approach
Do you make use of other national/funder/sectorial/departmental procedures for data management? If yes, which ones?	None.



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CONCLUSIONS

Deliverable D1.2 constitutes the initial version of the DMP for the OVERHEAT project, prepared at the six-month milestone. This first edition is conceived as a fundamental component of the research methodology, providing a robust framework for the systematic management of data across the entire project lifecycle. In recognition of its evolving nature, the DMP is established as a living document, subject to continuous revision and enhancement in response to the changing requirements of the research and the specific characteristics of the project.

Looking forward, the final version of the DMP will be issued as Deliverable D1.3 at the conclusion of the project (Month 36). This deliverable will consolidate the plan's evolution, documenting the iterative refinements and adjustments introduced throughout the project's duration.



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5. European Commission, "Guidelines on FAIR Data Management in Horizon 2020," European Commission, https://ec.europa.eu/research/participants/data/ref/h2020/grants_manual/hi/oa_pilot/h2020-hi-oa-data-mgt_en.pdf, 2016.

ANNEX

The OVERHEAT project provided replies for the issues addressed by the FAIR approach.

DMP Component	Issues to be addressed
1. Data summary	<ul style="list-style-type: none"> • State the purpose of the data collection/generation • Explain the relation to the objectives of the project • Specify the types and formats of data generated/collected • Specify if existing data is being re-used (if any) • Specify the origin of the data • State the expected size of the data (if known) • Outline the data utility: to whom will it be useful
2. FAIR Data 2.1. Making data findable, including provisions for metadata	<ul style="list-style-type: none"> • Outline the discoverability of data (metadata provision) • Outline the identifiability of data and refer to standard identification mechanism. Do you make use of persistent and unique identifiers such as Digital Object Identifiers? • Outline naming conventions used



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	<ul style="list-style-type: none"> • Outline the approach towards search keyword • Outline the approach for clear versioning • Specify standards for metadata creation (if any). If there are no standards in your discipline describe what type of metadata will be created and how
<p>2.2 Making data openly accessible</p>	<ul style="list-style-type: none"> • Specify which data will be made openly available? If some data is kept closed provide rationale for doing so • Specify how the data will be made available • Specify what methods or software tools are needed to access the data? Is documentation about the software needed to access the data included? Is it possible to include the relevant software (e.g. in open source code)? • Specify where the data and associated metadata, documentation and code are deposited • Specify how access will be provided in case there are any restrictions
<p>2.3. Making data interoperable</p>	<ul style="list-style-type: none"> • Assess the interoperability of your data. Specify what data and metadata vocabularies, standards or methodologies you will follow to facilitate interoperability. • Specify whether you will be using standard vocabulary for all data types present in your data set, to allow interdisciplinary interoperability? If not, will you provide mapping to more commonly used ontologies?



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<p>2.4. Increase data re-use (through clarifying licences)</p>	<ul style="list-style-type: none"> • Specify how the data will be licenced to permit the widest reuse possible • Specify when the data will be made available for re-use. If applicable, specify why and for what period a data embargo is needed • Specify whether the data produced and/or used in the project is useable by third parties, in particular after the end of the project? If the re-use of some data is restricted, explain why • Describe data quality assurance processes • Specify the length of time for which the data will remain re-usable
<p>3. Allocation of resources</p>	<ul style="list-style-type: none"> • Estimate the costs for making your data FAIR. Describe how you intend to cover these costs • Clearly identify responsibilities for data management in your project • Describe costs and potential value of long term preservation
<p>4. Data security</p>	<ul style="list-style-type: none"> • Address data recovery as well as secure storage and transfer of sensitive data
<p>5. Ethical aspects</p>	<ul style="list-style-type: none"> • To be covered in the context of the ethics review, ethics section of DoA and ethics deliverables. Include references and related technical aspects if not covered by the former
<p>6. Other</p>	<ul style="list-style-type: none"> • Refer to other national/funder/sectorial/departmental procedures for data management that you are using (if any)



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