iFACT-MP

D8.3- Data Management Plan (Issue 1)

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Abstract

This deliverable highlights the strategies and practices for effectively managing research data within the proposal's context. By carefully managing data and following established protocols, the project seeks to ensure that all research data is handled accurately, facilitating seamless sharing and utilization to support its ambitious objectives.

The FAIR principles—Findable, Accessible, Interoperable, and Reusable—offer a structured approach to effective data management, promoting ease of sharing and utilization. The iFACT-MP Data Management Plan (DMP) is designed to adhere to these principles by establishing clear guidelines for data usage, storage, and sharing within the project. Additionally, the DMP will outline procedures for data documentation and metadata creation to enhance the discoverability and usability of the collected data.

Keywords

Data management, FAIR principles, Open Science, DMP

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Table of Acronyms and Abbreviations

Acronym/Abbreviation	Description / Meaning
DMP	Data Management Plan
FAIR	Findable, Accessible, Interoperable, and Reusable
IPR	Intellectual Property Rights
TRL	Technology Readiness Level
WP	Work package
EU	European Union
OA	Open Access

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Table of Contents

List of Tables

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1. INTRODUCTION

The primary objective of a Data Management Plan (DMP) is to define and detail the procedures for managing the data generated and used during and after the completion of a research project. Recognizing the fluid nature of research, which often involves changes in direction, the DMP remains flexible to accommodate evolving research goals as the project progresses.

This document provides a comprehensive overview of various types of data, their intended purposes, and specified storage locations. It also highlights the protective measures that are implemented to safeguard the confidentiality of sensitive information collected throughout the project. Within the framework of iFACT-MP, all the data that are generated and repurposed are classified into four distinct categories: data summary, discoverable data, interoperable-accessible data, and repurposed data. Additionally, it encompasses "other research outputs" and "preservation-archiving" data categories.

These four data categories establish the fundamental structure for iFACT-MP 's comprehensive approach to managing and preserving research findings. They outline the methods for collection, processing, and generation, meticulously following the guidelines and regulations set forth by the European Commission (EC). The Findable, Accessible, Interoperable, and Reusable (FAIR) principles are deeply integrated, guiding the creation of Horizon Europe's data management strategy. Collaboratively crafted by the iFACT-MP consortium, this deliverable represents the collective effort of its partners. Each partner received a tailored questionnaire, and this document reports the insights gleaned from their responses. This release marks the DMP's first phase, with one update planned for M24 as the project concludes.

This report comprises two main sections. The second section is subdivided into four segments, each dedicated to a specific data type: Data Summary, FAIR Data, Additional Research Outputs, and Data Preservation Archiving. Each subsection begins with a concise overview of the pertinent data type information collected. Subsequently, a set of targeted questions is presented for each data category, accompanied by a summary of the responses provided by iFACT-MP partners, systematically presented in separate tables. This methodical approach is consistently applied across all four subsections.

Furthermore, the DMP encompasses the allocation of resources, robust data security protocols, and a blueprint outlining the procedures iFACT-MP will implement to safeguard sensitive data in compliance with the EC Data Protection and Privacy regulatory framework.

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2. DATA MANAGEMENT

Under Horizon Europe recommendations, a systematic approach has been developed for an effective Data Management Plan (DMP). The initial phase involves gathering data from the partners within the iFACT-MP consortium. EASN-TIS created a customized questionnaire, based on the EC's official template, and divided it into six categories. This questionnaire aims to provide a clear overview of the data types intended for generation, reuse, or both:

1. Data summary
2. Findable data
3. Accessible-Interoperable data
4. Reuse of data
5. Other research outputs
6. Data Preservation and Archiving

FAIR

The partners of iFACT-MP were provided access to the questionnaire, and this deliverable has been crafted based on their feedback. The following sections will address each type of question previously mentioned. It is important to note that the responses may not be complete, as the project is still in its early stages. However, as the project advances, significant update and enhancements to the current Data Management Plan (DMP) is anticipated, with one additional release scheduled for the 24th month of the project. Additionally, the existing DMP questionnaire will be refined. The structure of the DMP-specific questionnaire is detailed in Appendix A.

2.1 Data Summary

The iFACT-MP consortium has developed an introductory section for the initial Data Management Plan (DMP), focusing on the project's findings. In this section, we outline the data produced, repurposed, or both by iFACT-MP partners within the project's context. We also provide detailed insights into the data's nature, format, and size requirements. Furthermore, we explain the reasons behind data generation or repurposing, along with a brief clarification of how it aligns with the project's objectives. Additionally, we specify the data's origin and highlight its relevance to specific professional communities. The comprehensive information gathered in this context is derived from the questionnaire provided below. The responses from the iFACT-MP consortium are collected and summarized in Table 1.

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1. Will you re-use any existing data and what will you re-use it for? State the reasons if the reuse of any existing data has been considered but discarded.
2. What types and formats of data will the project generate or reuse?
3. What is the purpose of the data generation or re-use and its relation to the objectives of the project?
4. What is the expected size of the data that you intend to generate or reuse?
5. What is the origin/provenance of the data, either generated or re-used?
6. To whom might your data be useful ('data utility'), outside the iFACT-MP project?

Partner	Types and Formats of the generated/re-used data	Comments
1. Airbus FDH	**1.** Currently no re-use of previous data is foreseen. **2.** Measurement data will be saved natively in the InfluxDB binary format or is exported in .csv format, pre-processed data typically in .mat format and the analysis scripts as .m Matlab files. Photos of the developed hardware and test setups for documentation is saved as .png or .jpg. CAD model are generated in Autodesk Inventor and CATIA and their native formats, files for manufacturing are typically exported as .stp files. **3.** Measurement data needs to be collected and analysed to evaluate the performance of the developed EP subsystem. These performance metrics represent KPIs of the project and will therefore be used to evaluate the project success and compare the performance to competitors. **4.** For all testing activities including the raw test data, CAD models, manufacturing files and photos around 25 GB are expected. **5.** Test data will be generated during the pre-tests on component level, preliminary coupling tests and the final test campaigns (endurance test and environmental testing). Further data will be generated during the design and manufacturing phases (CAD models, manufacturing drawings). **6.** The EP community, especially those interested/working with iodine as propellant.	

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2. Airbus TLS+ELC	**1.** No re-used data, except for the PPU Breadboard specification, which will be based on the PPU specification provided by Toulouse. **2.** Documents (User Manual, Design report, Test plan, Test report and specification) in .pdf format Software in .py format mainly. **3.** Documents: description of the PPU Breadboard and how to operate it Software: management of the PPU Breadboard, either in manual or automatic mode. **4.** Less than 50Mo **5.** A test report will be generated using the PPU Breadboard test results. Other data will come from the PPU Breadboard development in Airbus Defence and Space ELC **6.** Only useful for those using the PPU Breadboard, thus only useful for iFACT-MP project.	
3. Fraunhofer IKTS	**1.** No. **2.** Test data (raw data such as .csv or .txt, processed data as .mat, plots, tables, diagrams); Media (photos, videos, microscopic imaging); Design and test reports (.docx, .pdf). **3.** The selected data of the emitter material will be needed to optimize the material properties. The data are used for controlling the reproducible preparation of the emitter material to getting reliability of the performance. **4.** MB **5.** Experimental data from measuring the phase composition, the thermal behaviou**r** such as shrinkage as function of the temperature or melting point and resistance of the material. **6.** The data can be used from other scientists to optimize the performance of the emitter material with different type of dopants. Comparison of the data from other scientific groups is possible. **7.** n/a	

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4. Aerospazio	**1.** The project will re-use the data collected in the previous iFACT activity. **2.** Re-use and generate: Technical report documents (PDF format). **3.** Re-use: Correct the new system design on the basis of the previous experience with iodine-fed thrusters testing.	
5. University of Pisa	**1.** No **2.** Test logbooks in .xls and .doc formats. Raw data acquisitions in .csv and .txt format. Images and pictures in .jpeg format. Blueprints and operation manuals of the prototypes. **3.** The collected experimental data will be necessary for the design, choice of materials, and realization of the mass flowmeter prototype. Moreover, the collected data will be also used for its calibration and characterization. **4.** Up to 1 Tb **5.** Experimental data will be obtained during from ad hoc test campaigns, in which data loggers and electronic measurement instruments are involved. **6.** The most significative results of the project will be included in scientific journal publications, of interest for the scientific community.	

Table 1 Summary of the data to be collected/generated during the project

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2.2 Findable, Accessible-Interoperable, and Reused data (FAIR)

Projects receiving funding from Horizon Europe are strongly encouraged to adopt Open Science principles. These principles promote the sharing of knowledge and have been shown to improve the quality, influence, and societal impact of scientific pursuits. The FAIR principles play a crucial role in realizing this goal. Acknowledging the utmost significance of Open Science, the iFACT-MP consortium is dedicated to upholding these principles. Our strategy is shaped by the ethos of being "as open as possible, as close as necessary". Horizon Europe projects are urged to make their research data freely accessible, with provisions for legitimate exceptions to address specific interests or constraints. The FAIR principles are an integral part to this endeavour, guiding the process in a conceptual rather than merely technical manner. This integration will be continuously monitored throughout the iFACT-MP project's duration.

This subsection presents the iFACT-MP consortium's strategy in enhancing the generated and repurposed data with FAIR attributes (2.2.1, 2.2.2, and 2.2.3), informed by partner responses to the below-mentioned inquiries. The collective insights are synthesized and presented in **Error! Reference source not found.**. It is crucial to underscore that this strategy reflects the project's present stage and is open to revision as the project advances and reaches new milestones. The systematic management of data sharing, archiving, and preservation is meticulously upheld throughout the project's lifecycle, encompassing both its active phase and beyond its conclusion. These measures are implemented as follows:

2.2.1 Findable Data

1. Will data be identified by a persistent identifier (PID)[1]?
2. Will rich metadata[2] be provided to your data sets to allow discovery? What metadata will be created?
3. Will search keywords be provided in the metadata to optimize the possibility for discovery and then potential re-use?
4. Are you aware of any metadata standards specific to your field that could be used for your data sets? If there is no metadata standard, what metadata will you need to generate so that others in your field will be able to find, understand, and make use of your data?
5. Persistent Standard Identification Mechanism - Digital Object Identifier is suggested as a persistent and unique identifier for iFACT-MP. Do you agree?

[1] A persistent identifier (PID) is a long-lasting reference to a digital resource. A well-known example of a PID for journal articles, books, and data sets is the Digital Object Identifier (DOI).
[2] Metadata is "structured information that describes, explains, locates, or otherwise makes it easier to retrieve, use, or manage an information resource", for instance, a data set. "A metadata record is a file of information which captures the basic characteristics of a data or information resource. It represents the who, what, when, where, why, and how of the resource".

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Partner	Types and Formats of the generated/re-used data	Comments
1. Airbus FDH	**1.** Project data released for publication (i.e. conference proceedings and papers) will be identified by their DOI. **2.** Internally, for all experiments for which data is recorded, a log is written which contains the test setup, test conditions, check list, test procedure, the timestamps for e.g. different operational points and notes on any irregularities. For any test data that might be published, a file with such data is foreseen to enable reuse and interpretation of the results. **3.** Yes **4.** No metadata standard in EP is known to us. Metadata would need to include test facility info (dimensions, target material, thruster mounting, diagnostics), test conditions (background pressure, grounding network), specification of the propellant used, description of the test articles. **5.** Agree	
2. Airbus TLS+ELC	**1.** All documents will have a Windchill identifier and will be stored in Airbus Defence and Space Windchill instanciation. **2.** No metadata will be created **3.** No applicable. **4.** No applicable **5.** Disagree	I am unsure of how this specific PID works, and if I have access to it. Every data will be stored in Airbus Defence and Space Windchill instanciation, with their own PID.
3. Fraunhofer IKTS	**1.** Fordatis is the institutional research data repository of the Fraunhofer-Gesellschaft. It is used for the publication of research data. Published data in Fordatis are getting a DOI number. **2.** The following metadata will be provided (as Excel file) for each experiment: Experiment number, Condition, Date, Entity, Description, Format **3.** Yes **4.** No **5.** Agree	

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4. Aerospazio	No responses	
5. University of Pisa	**1.** PID will be obviusly associated with scientific pubblications. Currently, using open data repositories is not foreseen for preliminary results. **2.** Produced data files will contain essential metadata, just for internal organization. **3.** Yes **4.** We are not aware of specific metadata to be associated with the research products but the most used metadata in scientific publications in the sector will be adopted if deemed necessary. **5.** Agree	

Table 2 Findable data

2.2.2 Accessible – Interoperable Data

In this group of questions, we are trying to identify the open data sets the iFACT-MP consortium prefers according to the recommendations of Open Research Europe. For that purpose, the following questions have been shared among the partners and their answers are summarized in Table 3. The second column of the table includes the answers addressing the "Accessible-Interoperable Data" dedicated questionnaire (i.e., Questions 1-8).

1. Will the data be deposited in a trusted repository?
2. ZENODO, an OpenAIRE and CERN collaboration platform, is suggested as a trusted repository for iFACT-MP. Do you agree?
3. Will all data be made openly available? If certain datasets cannot be shared (or need to be shared under restricted access conditions), explain why separating legal and contractual reasons from intentional restrictions.
4. If an embargo is applied to give time to publish or seek the protection of the intellectual property (e.g. patents), specify why and how long this will apply, bearing in mind that research data should be made available as soon as possible.
5. If there are restrictions on use, how will access be provided to the data, both during and after the end of the project?
6. Will the collected/generated data require special software, hardware or any specific technique or tool to be accessed or "read"? If so, will it be possible to include the relevant software/ tools (e.g. in open-source code)?

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7. What data and metadata vocabularies, standards, formats, or methodologies will you follow to make your data interoperable to allow data exchange and reuse within and across disciplines? Will you follow community-endorsed interoperability best practices? Which ones?[3]
8. Will your data include qualified references to other data (e.g. other data from your project, or datasets from previous research)?

Partner	Types and Formats of the generated/re-used data	Comments
1. Airbus FDH	**1.** As this is a restricted topic, publishing data is pending EC authorization. Typically, the processed data (thruster performance mapping in terms of thrust, specific impulse, efficiencies at different operational points is published in proceedings or papers. Any raw data that might be published, will be published in a trusted repository. **2.** Agree. **3.** Not all data will be made openly available, the following restrictions apply: a. As it is a restricted topic, publication of results is pending EC approval. b. Contractually, the participants are only obliged to publish the deliverables at their defined dissemination level (public or sensitive, most deliverables are classified sensitive). c. Proprietary information of the participants, such as detailed designs or control software, is not shared. d. It is very common in the field to publish only the processed data (i.e. thruster performance mappings) instead of the raw data. **4.** All publications are pending with the consortium's and the EC's approval, with a review period of 2 weeks after which the publication is considered approved if no objections are raised. **5.** Responsibility for the storage of restricted data lies within each participant. Airbus internally, the data is stored on protected Airbus servers and will be kept after the end of the project. iFACT-MP internal data is stored in the Fraunhofer OwnCloud.	

[3] Humans should be able to exchange and interpret each other's data so preferably do not use dead vocabulary. But this also applies to computers, meaning that data should be readable for machines without the need for specialized or ad hoc algorithms, translators, or mappings. Interoperability, typically, means that each computer system at least has knowledge of the other system's data exchange formats. For this to happen and to ensure automatic findability and interoperability of data sets, it is critical to use commonly used controlled vocabularies, keywords, ontologies, and thesaurus (having resolved globally unique and persistent identifiers.)

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	6. The test data is stored in commonly used formats such as .csv or .mat, and can be accessed with e.g. Matlab or open source alternatives, such as Octave. **7.** The data is stored in timetable format where the columns have labels that include the type of data (e.g. temperature or current), the location (e.g. thruster heater or anode supply) and the SI unit. For labelling, the common vocabulary of the EP community is used to ensure interoperability. **8.** No. Data generated within the project will be used.	
2. Airbus TLS+ELC	**1.** All data will be available in the Airbus Defence and Space G-drive, shared between FDH, TLS and ELC, and in Airbus Defence and Space Windchill instantiation. As we don't have access to any other repository, I assume Gerrit will make the data available in a shared trusted repository for other partners. **2.** Disagree **3.** PPU Breadboard specification, Test Plan and Test report will be made openly available. PPU Breadboard User Manual and Design Report will be made available on a need-to-know basis: data to enable Airbus Defence and Space FDH to operate the PPU Breadboard will be more detailed than data which will be made openly available to protect Airbus Defence and Space competitive data. Software for the PPU Breadboard will only be made available to Airbus Defence and Space FDH to protect Airbus Defence and Space competitive data. **4.** No applicable **5.** Data with restrictions on use will only be made available on the Airbus Defence and Space G-drive and on the PPU Breadboard computer, for Airbus Defence and Space internal use. **6.** Documents: no specific tool needed to access them. Software: specific tool to access it will be set up on the computer which is part of the PPU Breadboard. **7.** File formats for documents are .pdf using nonspecific vocabulary, thus are readable by anyone. Software file formats are .py files with commentarie**s** to make them understandable for someone with a minimum SW background. **8.** Yes.	Documents are linked (for example, the User Manual may refer to the Design Report for a better comprehension of the PPU Breadboard hardware).

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3. Fraunhofer IKTS	**1.** Fordatis is the institutional research data repository of the Fraunhofer-Gesellschaft. **2.** Agree. **3.** Selected data of the optimized emitter material will be available. Not every experiment will be published. **4.** Not expected now **5.** The data will be shared with the project partners. Relevant data for preparation of the emitter material will be published with Fordatis and in scientific papers (Open Access journals). **6.** No. **7.** We will use file formats that are as open and widely used as possible, which will also facilitate data exchange between partners. **8.** No.	

4. Aerospazio	No responses	

5. University of Pisa	**1.** 1. Deliverables and data useful for the rest of the consortium will be stored in Fraunhofer cloud. Data for internal use of University of Pisa will be stored in a cloud managed by the University. **2.** Agree **3.** Knowledge produced by this research will be part of scientific publications. **4.** It is not possible at this time to predict the search will produce embargoed material. **5.** The results obtained from the experimentation conducted in this project will be available to all project participants, through the cloud-based sharing platform. At the end of the project the most significant results will be disclosed publicly in scientific journals in the sector.	Scientific Publications

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	6. The research activity will produce electronic documents in the standard format for the main editing software (Word, Excel, Power Point, etc.). **7.** 7. Documents produced will use terms and formats commonly used in the field of Electric Propulsion. Moreover, the Electric Propulsion community aims at implementing recommended practice in the field (DOI: 10.2514/1.B35644), such recommendations will be followed. **8.** 8. Yes.	

Table 3 Accessible – Interoperable Data

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2.2.3 The Reuse Data

In this set of questions, we aim to clarify the type of documentation that may be necessary to validate data analysis and facilitate data reuse. This includes readme files with information on methodology, codebooks, data cleaning procedures, variable definitions, and units of measurement. In order to achieve this goal, and using a comparable approach to the ones discussed earlier, the survey provided below was circulated to all iFACT-MP partners and their responses are summarized in Table 4.

1. Will you provide the documentation needed to validate data analysis and facilitate data reuse (e.g., readme files with information on methodology, codebooks, data cleaning, analyses, variable definitions, units of measurement, etc.)?
2. Will your data be made freely available to permit the widest reuse possible? Will they be licensed using standard reuse licenses, in line with the obligations set out in the Grant Agreement? (Please specify license type, e.g., CC-BY).
3. Describe all relevant data quality assurance processes.

Partner	Types and Formats of the generated/re-used data	Comments
1. Airbus FDH	**1.** In case raw data is published, it will include a readme file with the necessary information to use and interpret the data set. **2.** The results and processed data to be published in journals will be open access CC-BY wherever possible to ensure access and re-use. For papers, the raw data will typically be made available upon reasonable request. **3.** All data by all devices and power supplies used is logged continuously and is stored loss-proof. Before testing, the data acquisition is checked and whether all channels show correct values. Each measurement channel is given a unique label that includes the type and unit of measurement and the location/parameter that is measured. After testing, the relevant channels are extracted to remove unused channels and to reduce the size of the dataset.	
2. Airbus TLS+ELC	**1.** No, because all documents should be self-sufficient. **2.** Data from the Grant Agreement will be made freely available, on a need-to-know basis (exhaustive data to operate the PPU Breadboard will only be made available to Airbus Defence and Space parties).	

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	3. Data will be stored on the Airbus Defence and Space Windchill instanciation, with modification management, so in case of any doubt, the original data can be provided again from Windchill.	
3. Fraunhofer IKTS	**1.** No **2.** The data will be published in scientific papers. **3.** Experimental data will be obtained from measurements (e. g. phase analysis by XRD measurement, shrinkage by dilatometry) using devices which are calibrated with standard specimen. Internal validation procedures are implemented by calibration to obtain high accuracy and reliability of the data.	
4. Aerospazio	No responses	
5. University of Pisa	**1.** Yes, the prototype will include a user's manual. **2.** No, most significative results will be included in scientific journal publications. **3.** Experimental data will be obtained from certified instruments and diagnostics. Internal validation procedures will be implemented to systematically verify the level of accuracy of the experimental measurements.	

Table 4 The Reuse Data

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2.2.4 Other Research Outputs

In this Section, we are trying to aggregate info regarding any additional research outputs which may arise, and whether they will be in digital format (e.g., software, workflows, protocols, models, etc.) or a physical one (e.g., new materials, samples, etc.). The status of this task is formed by the feedback that the iFACT-MP partners provided to EASN and is summarized in Table 5.

Partner	Types and Formats of the generated/re-used data	Comments
1. Airbus FDH	**1.** Besides test data, the project will generate: test protocols, CAD models, analytical models to assess the devices performance, physical models (hardware), manufacturing data (technical drawings, CAD models) **2.** The detailed CAD models and manufacturing data is proprietary and will be stored Airbus-internally. Analytical models referenced in the publication will be made available upon request.	
2. Airbus TLS+ELC	**1.** The PPU Breadboard hardware containing all the necessary hardware components, assembled together, in order to handle the iFact-MP thruster. The PPU Breadboard software to manage the hardware and handle the thruster, either in manual or in automatic mode. **2.** These outputs will be provided to Airbus Defence and Space FDH, along with the documents (Test Plan, User Manual and Design Report) to operate it. During the coupling tests, the ELC team will give more explanation and train the FDH team to use the PPU Breadboard,	
3. Fraunhofer IKTS	**1.** The emitter material with higher melting point is aimed to be developed. **2.** The processing will be reported in scientific journals or at conferences.	

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4. Aerospazio	No responses	

5. University of Pisa	**1.** Given the ammount of data foreseen, no extra cost for management and preservation are expected. **2.** Most significative results will be included in scientific journal publications. Additional data will be shared upon reasonable request.	

Table 5 Other research outputs may arise throughout the course of iFACT-MP

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2.3 Data Preservation-Archiving, data security, and ethical aspects

The iFACT-MP consortium prioritizes the secure handling of generated data throughout the entire lifecycle of the project, emphasizing the importance of protecting this data against accidental loss and unauthorized manipulation. The research data generated and managed by iFACT-MP will undergo various storage, preservation, and archiving methods, depending on the associated sharing policies. Regardless of the data's level of openness, the primary goal is to ensure its preservation and accessibility to relevant stakeholders during and beyond the project's duration.

Each partner within the iFACT-MP consortium is responsible for securely managing and storing project-related data, ensuring strict compliance with pertinent EU data protection regulations. Authors may also use their institutional repositories if available, alongside utilizing Zenodo. A dedicated iFACT-MP account/folder will be established on Zenodo. As the project progresses, this section is expected to grow and evolve.

Partner	Types and Formats of the generated/re-used data	Comments
1. Airbus FDH	**1.** Publication fees for open access journals are foreseen to be covered by the grant. Depending on the journal, it can be in the range of 1000-2600€ or be waived in case of cooperations. **2.** Laboratory internally a NAS with RAID is used to prevent data loss in case of hard drive failures. Backups or long-term storage uses the protected Airbus internal IT infrastructure. iFACT-MP internal data is stored in the Fraunhofer OwnCloud, using Fraunhofer servers. **3.** Yes, **4.** Yes,	Ethics: No Legal: Publications of data is pending approval of the participants, who can veto it if it would show proprietary information. Airbus internal data classification regarding export control.

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2. Airbus TLS+ELC	**1.** I don't know how to estimate those costs **2.** Archiving in Airbus Defence and Space Windchill instanciation **3.** No **4.** Airbus Defence and Space Windchill instanciation Airbus Defence and Space shared G-drive	Data to be shared should not contain any ethical data nor data that could lead to legal issues Windchill: archiving tool which gives a PID and a data change management G-drive: Google drive shared between Airbus Defence and Space ELC, FDH and TLS
3. Fraunhofer IKTS	**1.** Not known **2.** The data will be stored on Fraunhofer's own servers in Germany. Fraunhofer ensures that the data is backed up regularly. Archive the data for at least 10 years. **3.** No (Please specify in the comment area). **4.** No	
4. Aerospazio	No responses	
5. University of Pisa	**1.** Given the amount of data foreseen, no extra cost for management and preservation are expected. **2.** Most significative results will be included in scientific journal publications. Additional data will be shared upon reasonable request. **3.** No **4.** No	There are no legal or ethical issues related to the data produced.

Table 6 Data Archiving

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3. SUMMARY

This document embodies the collaborative efforts to define, structure, and securely store all datasets generated throughout the project. It organizes the collected information into four main sections: Data Summary, FAIR Data, Other Research Outputs, and Data Preservation-Archiving, serving as a roadmap for the initial release of the DMP. Dedicated questionnaires were used for each data type to gather pertinent information, with detailed responses from the iFACT-MP Consortium presented in dedicated tables and summarized in the final paragraph of each category.

Emphasis is placed on FAIR data, forming the cornerstone of the management and preservation strategy for research data collected during and after the project's lifecycle. Data summaries focus on types, formats, expected sizes, and the rationale behind data generation or reuse in line with iFACT-MP's objectives. The section on Other Research Outputs explores potential additional research results within the project framework, including software, workflows, protocols, and models.

Regarding data preservation and archiving, the document outlines the use of the project's collaborative server to store deliverables, reports, and other project-related materials, emphasizing data security measures. Complementary aspects address the authors' responsibilities in tracking and depositing relevant research data generated by iFACT-MP, along with considerations for ethical compliance, including the prevention of personal data misuse.

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4. APPENDIX A – QUESTIONNAIRE TEMPLATE FOR THE DATA COLLECTION

	I. Data summary	Describe the types and format of data the project will generate / collect	Comment Area: Participants are encouraged to fill in *where appropriate*
2	1.Will you re-use any existing data and what will you re-use it for? State the reasons if re-use of any existing data has been considered but discarded.		
3	2. What types and formats of data will the project generate or re-use? (please shortly specify in the comment area)	*example: Interview responses will be saved in Nvivo .nvp format.*	
4	3. What is the purpose of the data generation or re-use and its relation to the objectives of the project?		
5	4. What is the expected size of the data that you intend to generate or re-use?		
6	5. What is the origin/provenance of the data, either generated or re-used?	*example: Survey responses will be acquired using the REDCap survey software*	
7	6. To whom might your data be useful ('data utility'), outside iFACT-MP project?		

	II. Findable Data	Please carefully read the explanatory notes, where available, in column A by setting your mouse cursor on the question and provide your detailed answers.	Comment Area: Participants are encouraged to fill in *where appropriate*
2	1. Will data be identified by a persistent identifier (PID)?		
3	2. Will rich metadata be provided to your data sets to allow discovery? What metadata will be created?	*example: - Documentation will include a standardized folder structure, codebooks (metadata about the data), logbooks (metadata about data processing), analysis plans, input and output files from databases and statistical software* *- The following metadata will be provided (as Excel file) for each experiment: Experiment number, Condition, Date, Entity, Description, Format*	
4	3. Will search keywords be provided in the metadata to optimize the possibility for discovery and then potential re-use?		
5	4. Are you aware of any metadata standards specific to your field that could be used for your data sets? If there is not a metadata standard, what metadata will you need to generate so that others in your field will be able to find, understand, and make use of your data?		
6	5. Persistent Standard Identification Mechanism - Digital Object Identifier is suggested as a persistent and unique identifier for iFACT-MP. Do you agree?		

	III. Accessible and Interoperable Data	Describe how this data will be shared/made accessible. If data cannot be made publicly available, explain why. Please carefully read the explanatory notes, where available, in column A by setting your mouse cursor on the question.	Comment Area: Participants are encouraged to fill in *where appropriate*
2	1. Will the data be deposited in a trusted repository?		
3	2. ZENODO, an OpenAIRE and CERN collaboration platform, is suggested as trusted repository for iFACT-MP. Do you agree?		
4	3. Will all data be made openly available? If certain datasets cannot be shared (or need to be shared under restricted access conditions), explain why, clearly separating legal and contractual reasons from intentional restrictions. Note that in multibeneficiary projects it is also possible for specific beneficiaries to keep their data closed if opening their data goes against their legitimate interests or other constraints as per the Grant Agreement.		
5	4. If an embargo is applied to give time to publish or seek protection of the intellectual property (e.g. patents), specify why and how long this will apply, bearing in mind that research data should be made available as soon as possible.		
6	5. If there are restrictions on use, how will access be provided to the data, both during and after the end of the project?		
7	6. Will the collected/generated data require special software, hardware or any specific technique or tool to be accessed or "read" ?If so, will it be possible to include the relevant software/ tools (e.g. in open-source code) ?		
8	7. What data and metadata vocabularies, standards, formats or methodologies will you follow to make your data interoperable to allow data exchange and re-use within and across disciplines? Will you follow community-endorsed interoperability best practices? Which ones?	*example: We plan to make our datasets interoperable by using controlled vocabularies, keywords or ontologies where possible. Simulation/modelling data will be documented in accordance with community standards defined by the X Standards Initiative. We will also use file formats that are as open and widely used as possible, which will also facilitate data exchange between partners.*	
9	8. Will your data include qualified references to other data (e.g. other data from your project, or datasets from previous research)?		

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IV. Reuse Data	Please carefully read the explanatory notes, where available, in column A by setting your mouse cursor on the question and provide your detailed answers.	Comment Area: Participants are encouraged to fill in *where appropriate*
1. Will you provide documentation needed to validate data analysis and facilitate data re-use (e.g. readme files with information on methodology, codebooks, data cleaning, analyses, variable definitions, units of measurement, etc.)?		
2. Will your data be made freely available to permit the widest re-use possible? Will they be licensed using standard reuse licenses, in line with the obligations set out in the Grant Agreement? (please specify license type, e.g CC-BY).		
3. Describe all relevant data quality assurance processes.		

	IV. Other Research Outputs	Describe the other research outputs that the project will generate	Comment Area: Participants are encouraged to fill in *where appropriate*
1			
2	1. What other research outputs will the project generate or re-use? Such outputs can be either digital (e.g. software, workflows, protocols, models, etc.) or physical (e.g. new materials, samples, etc.). Please shortly specify.		
3	2. How these research outputs will be managed and shared, or made available for re-use, in line with the FAIR principles?		

	IV. Data Preservation and Archiving (including storage and backup)	How will the data be curated and preserved (including Data storage and back up) during and after the research?	Comment Area: Participants are encouraged to fill in *where appropriate*
1			
2	1. Do you know how much it will cost to make these data sets and/or research outputs available? How will you cover these costs? (e.g. direct and indirect costs related to storage, archiving, re-use, security, etc.). Note that costs related to research data/output management are eligible as part of the Horizon Europe grant (if compliant with the Grant Agreement conditions).		
3	2. What provisions are or will be in place for data security (including data recovery as well as secure storage/archiving and transfer of sensitive data)?		
4	3. Are there, or could there be, any ethics or legal issues that can have an impact on data sharing?		
5	4. Do you, or will you, make use of other national/funder/sectorial/departmental procedures for data management? If yes, which ones (please list and briefly describe them in the comment area).		

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