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RESCHIP4EU
Reinforcing Skills in Chips Design for Europe

Deliverable D4.2: Data Management Plan

Deliverable D4.1

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Abstract

This Data Management Plan (DMP) outlines how data within the project is managed in a FAIR (findable, accessible, interoperable, and reusable) manner. The DMP has been created in accordance with the Horizon Europe Data Management Plan Template. The DMP should include information on the handling of research data during and after the end of the project, what data will be collected, processed, and/or generated, how data will be curated and preserved, and other relevant issues. By following the guidelines outlined in the DMP, project partners can ensure that data is managed in a way that maximizes its value and impact.

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Version	Date	Authors	Notes
0.1	12/09/2024	Romane Léauté (EITD)	First version of D4.2
0.2	12/11/2024	Franco Callegati (UNIBO) and Tamás Dabóczy (BME)	Second version of D4.2
0.3	19/11/2024	Romane Léauté (EITD)	Final version of D4.2

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1. Introduction

This Data Management Plan has been created following the Horizon 2020 FAIR DMP template, which has been designed to be applicable to any Horizon 2020 project that produces, collects or processes research data.

This document is intended to follow the best practices for a FAIR data management¹.

Definition: FAIR data management

In general terms, your research data should be 'FAIR', that is findable, accessible, interoperable and re-usable. These principles precede implementation choices and do not necessarily suggest any specific technology, standard, or implementation-solution.

This Data Management Plan is a set of questions, from the Horizon 2020 template, that were answered with a level of detail appropriate to the project. This DMP is intended to be a living document in which information can be made available on a finer level of granularity through updates as the implementation of the project progresses and when significant changes occur.

As a minimum, the DMP should be updated in the context of the periodic evaluation/assessment of the project. If there are no other periodic reviews envisaged within the grant agreement, an update needs to be made in time for the final review at the latest.

1.1 RESCHIP4EU

Reinforcing Skills in Chips Design for Europe (RESCHIP4EU) aims at supporting the excellence of EU higher education in the area of the design of lighter, smarter, more efficient, low-cost, and greener integrated chips and circuits, updating the

¹ FAIR Data Principles (FORCE11 discussion forum):

<https://force11.org/group/fairgroup/fairprinciples>

FAIR principles (article in Nature): <https://www.nature.com/articles/sdata201618>

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academic curricula on this cutting-edge topic through the matching between the industry needs and the academic offer. The project will increase awareness of the impact of semiconductors in society and citizens' daily life. It will also provide startups and SMEs the opportunity to become hosts of students' internships. Semiconductors are at the core of all technologies. On the other hand, the limited human resources and the lack of sufficient qualified staff with respect to the market demand creates a bottleneck for the industry. The semiconductor industry is at the start of a 10-year reset in the wake of the pandemic, geopolitical turmoil, and the resulting global chip shortage. It is reshaping itself to enable the age of artificial intelligence (AI) and the Internet of Things (IoT). The semiconductors' fundamental importance as the workhorse of modern technology has been recently highlighted amid shortages that have impacted sectors of the economy and the availability of cars, mobile phones, and personal computers, which are reliant on silicon-based microchips.

2. Work Package 4

The objectives of Work Package 4 are as follows:

- To oversee project management and provide effective monitoring across administrative, technical, and financial aspects.
- To ensure high-quality content and management practices that drive meaningful project progress.
- To coordinate the participant enrollment process for the RESCHIP4EU education programs.
- To foster the creation of effective and sustainable partnerships within the project consortium.

This work package focuses on leading the technical and scientific coordination of the RESCHIP4EU project, along with its administrative and financial management. It will also implement quality control and reporting mechanisms throughout the project.

3. Deliverable 4.2

3.1 Purpose

The RESCHIP4EU Project Handbook has been prepared with two purposes:

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1. to describe the data management life cycle for the data to be collected, processed and/or generated by the RESCHIP4EU project;
2. include information on the handling of research data during and after the end of the project, what data will be collected, processed and/or generated, how data will be curated and preserved, and resource and budgetary planning for data management.

3.2 Objectives

- Ensure effective management of research data throughout the project life cycle.
- Describe the data management life cycle for the data to be collected, processed and/or generated by the project.
- Ensure that research data is findable, accessible, interoperable and re-usable (FAIR).
- Ensure that research data is managed in compliance with the General Data Protection Regulation (GDPR).
- Reflect the current state of consortium agreements on data management and be consistent with exploitation and Intellectual Property Rights (IPR) requirements.
- Provide an overview of all datasets collected and generated by the project and define the consortium's data management policy and approach.

4. Data summary

In order to provide an overview of the different data sets that are currently and will be produced in the RESCHIP4EU project, we need to distinguish two types of data:

1. Non-sensitive data produced by the project, publicly available, and released for potential reuse in other projects or research activities.
2. Operational data used to implement the activities described in the project. This data includes very frequently also sensitive data about students and participants to training activities.

The following table shows the data type, the origin of the data, the related WP number and the format, in which the data will be presumably stored.

Table 1: Data sets overview

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#	Data type	Type	Origin	WP#	Format
1	Market review of Embedded Systems and Chips Design sectors.	Non-sensitive	Derived data by other reports and market data.	WP1, WP2	.pdf
2	Literature review data on Embedded Systems and Chips Design.	Non-sensitive	Derived data by publications or published reports.	WP1, WP2	.pdf
3	Recruitment cycle data about participants.	Operational	Primary data	WP1, WP2	.xlsx and .docx and .pdf
4	Personal data of students participating to master programs.	Operational	Primary data	WP1, WP2	.xlsx and .pdf and university systems
5	Data on participants to self-standing modules.	Operational	Primary data	WP1, WP2	.xlsx and .pdf
6	Satisfaction survey from students at the end of a learning course or activity.	Operational	Primary data	WP1, WP2	.xlsx and .pdf
7	Marketing data related to communication and dissemination activities.	Operational	Primary data	WP3	.xlsx and .pdf

describes the data set and the purpose of the data collection of data generation in relation with the objectives of the project. Additionally, it shows the data utility for clarifying to whom the data might be useful.

Table 2: Data sets description and utility

#	Data type	Description & Purpose	Utility
1	Market review of Embedded Systems and Chips Design sector.	Description The data contains the result of a market review analysis done on the field of Embedded Systems and Chips Design.	The data could be useful for research on the Embedded Systems and Chips Design sectors.

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#	Data type	Description & Purpose	Utility
		<p>The analysis will be performed by analyzing publicly available market data and by interviewing economic actors in the sector.</p> <p>Purpose The collection of this data will serve as an input to the process of review of the master program curriculum. This data will also serve to guide the definition of the content for the self-standing learning modules.</p>	<p>It can also be useful for other educational institutions and to organizations and business to better understand the current state of the market, identify the latest trends and threats and make informed decisions about Embedded Systems and Chips Design products and services.</p>
2	Literature review data on Embedded Systems and Chips Design.	<p>Description The data contains the result of a literature review done on the field of Embedded Systems and Chips Design. The analysis will be performed by analyzing publications, articles and course syllabi from other universities and higher education institutions.</p> <p>Purpose The collection of this data will serve as an input to the process of review of the master program curriculum on Embedded Systems and Chips Design. This data will also serve to guide the definition of the content for the self-standing learning modules.</p>	<p>The data could be helpful to researcher interested in understanding the current state of knowledge in the field of Embedded Systems and Chips Design, identify gaps in the literature and develop research question and hypotheses. The data can also be useful for policymakers by helping the development of policies and regulations that are evidence-based and effective.</p>
3	Recruitment cycle data about participants.	<p>Description This data includes all the personal information of candidates applying for the master programmes. The data will</p>	<p>Researchers can use this data, after anonymization, to study the qualifications and backgrounds of candidates applying for master's</p>

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#	Data type	Description & Purpose	Utility
		<p>include contact information, CV history and study track records for all applicants.</p> <p>Purpose Data is gathered for administrative purposes and to enable the selection of candidates, including the awarding of scholarships, based on their recent educational and professional history.</p>	<p>programs or jobs. The data can help researchers identify trends and patterns in the qualifications and backgrounds of successful candidates and develop research questions and hypotheses.</p> <p>Personal data could be shared with relevant third parties (i.e. employers or recruitment agencies) upon collection of individual and informed consent of participants.</p>
4	Personal data of students participating to master programs.	<p>Description This data includes all the personal information of students of the master programs. The data will include contact information, CV history and study track records for all students and will be managed by the guesting universities following the general rules for all students.</p> <p>Purpose Data is gathered for administrative purposes (i.e. admission process), to enable participation to the courses and track of the student's academic pathway .</p>	<p>Researchers can use this data, after anonymization, to study the qualifications and backgrounds of learners of the self-standing modules. The data can help researchers identify trends and patterns in the qualifications and backgrounds of online students and develop research questions and hypotheses.</p> <p>Personal data could be shared with relevant third parties (i.e. employers or recruitment agencies) upon collection of individual and informed consent of students.</p>
5	Data on participants to self-standing modules.	<p>Description Data related to the registration and participation to self-standing modules. This data includes contact information and digital addresses of all participants. The data also includes information regarding</p>	<p>Researchers can use this data, after anonymization, to study the qualifications and backgrounds of learners of the self-standing modules. The data can help researchers identify trends and patterns in the qualifications and</p>

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#	Data type	Description & Purpose	Utility
		<p>eventual certifications obtained by the participants.</p> <p>Purpose Data is gathered for administrative purposes to enable the access to the online platform and the tracking of the study activities.</p>	<p>backgrounds of online students and develop research questions and hypotheses.</p> <p>Personal data could be shared with relevant third parties (i.e. employers or recruitment agencies) upon collection of individual and informed consent of participants.</p>
6	Satisfaction survey from students at the end of a learning course or activity.	<p>Description Data related to the results of the satisfaction survey gathered from students of master and self-standing modules.</p> <p>Purpose Data is gathered to implement a quality improvement process and to improve courses and training material.</p>	<p>The data is of interest to the project participants to obtain workable feedback and encourage continuous improvement cycle of the courses materials and trainings paths. It will not be publicly available unless anonymized.</p>
7	Marketing data related to communication and dissemination activities.	<p>Description Data regarding the communication and dissemination campaign on social networks and digital channels.</p> <p>Purpose Digital marketing will be a central part of the strategy of attraction to candidate students to the project's program. Collecting operational data is fundamental for digital communication to work effectively.</p>	<p>The anonymized data could be helpful to digital marketing agencies or marketing professional interested in evaluating the effectiveness of their digital marketing campaigns and identify areas for improvement.</p> <p>Researchers can use this anonymized data to study the effectiveness of digital marketing campaigns and identify trends and patterns in the participation of potential students or customers.</p>

5. FAIR Data

5.1 Making data findable, including provisions for metadata

To ensure that the data generated during the project is findable, we will implement the following provisions:

- All data will be recorded in a predetermined structure and with agreed data formats.
- Data structure and format will ensure interoperability and ease of use.
- To ensure that the data is discoverable, we will implement the following mechanisms:
 - Data will be assigned unique identifiers to enable easy identification and tracking.
 - Data will be stored in a structured and organized manner to enable efficient searching and browsing.
 - Data will be made available through appropriate repositories and archives to enable discovery and reuse.

5.2 Making data accessible

The following table is highlighting which data is intended for internal use (within RESCHIP4EU project) and which will be made openly available. It also explains why several datasets cannot be shared because of particular reasons and, in this case, an alternate solution will be presented.

Table 3: Data sets accessibility

#	Data type	Openly available	Justification	Alternate solution
1	Market review of Embedded Systems and Chips Design sectors.	Yes	Results of this analysis will be described in the project deliverable D1.1.	<i>(not relevant)</i>

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#	Data type	Openly available	Justification	Alternate solution
2	Literature review data on Embedded Systems and Chips Design	Yes	Results of this review will be described in the project deliverable D1.1.	<i>(not relevant)</i>
3	Recruitment cycle data about participants.	No	The sensible data about students involved in the recruitment process of the project will not be released, in respect to GDPR and any other regulation that may apply.	Statistical data about the recruitment cycle and student admissions will be described in the project deliverables D4.4, D4.5, D4.6, D4.7.
4	Data of students participating to master programs.	No	The sensible data about students participating to courses and learning activities of the project will not be released, in respect to GDPR and any other regulation that may apply.	Statistical data about the student participation to the master will be described in the project deliverables D1.2, D1.3, D1.4.
5	Data on participants to self-standing modules.	No	All personal data, including contact information, regarding students, will not be made openly available, in respect to GDPR and any other regulation that may apply.	Statistical data about the student participation to the master will be described in the project deliverables D2.2, D2.3.
6	Satisfaction survey from students at the end of a learning	No	All personal data of students, including contact information and opinion on the course quality, will not be made	Statistical data about the student satisfaction expressed for the courses attended will be

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#	Data type	Openly available	Justification	Alternate solution
	course or activity.		openly available, in respect to GDPR and any other regulation that may apply.	described in the project deliverables D1.2, D1.3, D1.4, D2.2, D2.3.
7	Marketing data related to communication and dissemination activities.	No	The granular and analytical marketing data used to guide communication and dissemination activities will not be released.	Statistical aggregated data about marketing and dissemination activities will be released in deliverables D3.2, D3.3, D3.4, D3.5.

The data intended for open availability, will be registered in official project deliverables and, as such, will be published on the project website and on the EC portal for public access.

5.3 Making data interoperable

All the data shared by the project will use document standards that will make it interoperable. The aim is to achieve a standardized, open, and flexible way to exchange and reuse data across different systems and applications.

5.4 Increase data re-use (through clarifying licences)

To permit the widest re-use of data, all openly available project deliverables and main results will be released with a Creative Commons Attribution (CC-BY) license. This license allows others to distribute, remix, and build upon the data, even commercially, as long as they credit the original source.

The data released under this license does not include:

- any sensible information regarding students, that will be protected by GDPR and other relevant regulation,
- the master's course materials, that will remain property of the producing entity, and
- the online training modules, that will maintain a shared ownership between the beneficiaries that have generated them.

6. Allocation of resources

The following resources will be allocated to ensure effective data management throughout the project:

- **Personnel:** Data management will be overseen in Task 4.5 of the WP4. The task will permit all partners involved in these activities to dedicate resources, including personnel, to the tasks and activities related to data management. A data manager will be appointed to oversee the implementation of the data management plan and ensure compliance with relevant regulations and guidelines. The data manager will be responsible for creating and maintaining the metadata, ensuring data quality, and managing the storage and security of the data. The data manager will also be responsible for training project personnel in data management best practices.
- **Infrastructure:** The project will allocate resources for the storage and backup of data in secure locations. For this purpose, the project will use the website and the Teams instance of the coordinator partner: EIT Digital.
- **Budget:** The project will allocate a budget for data management activities. The budget will also include provisions for the dissemination and sharing of data, including the use of appropriate repositories and archives.
- **Deliverables:** This deliverable D4.2 of the project describes an initial data management plan. The project will also include deliverables for the dissemination and sharing of data.

The allocation of resources will be reviewed and updated throughout the project as necessary to ensure that the data management plan remains effective and compliant with relevant regulations and guidelines. The project will also ensure that the allocation of resources is consistent with exploitation and Intellectual Property Rights (IPR) requirements.

7. Data security

The project will implement the following measures to ensure the security of the data recorded on the Microsoft Teams platform used to store all relevant project data:

8. **Access controls:** Access to the data will be restricted to authorized personnel only. The project will use Microsoft Teams to manage access

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controls, including role-based access controls and multi-factor authentication.

9. **Backup and recovery:** The project will implement a backup and recovery plan to ensure that the data is recoverable in the event of a disaster or system failure. The project will use the Microsoft's platform backup and recovery capabilities to ensure that the data is protected.
10. **Data retention and disposal:** The project will implement a data retention and disposal policy to ensure that data is retained only for as long as necessary and disposed of securely when it is no longer needed.
11. **Monitoring and auditing:** The project will implement monitoring and auditing procedures to ensure that the data is being used appropriately and that any unauthorized access or use is detected and addressed.

The project will also ensure that all personnel involved in the project are trained in data security best practices and that they understand their roles and responsibilities in protecting the data. The project will also ensure that all data management activities are compliant with relevant regulations and guidelines.

8. Ethical aspects

The project will ensure that all data management activities are conducted in compliance with relevant ethical guidelines and regulations. The following ethical aspects will be considered:

1. **Informed consent:** The project will obtain informed consent from all participants before collecting any data. Participants will be informed about the purpose of the data collection, how the data will be used, and any potential risks or benefits associated with the data collection.
2. **Data privacy:** The project will ensure that all data is collected, stored, and shared in compliance with relevant data privacy regulations. The project will implement appropriate measures to protect the privacy and confidentiality of the data, including encryption, access controls, and data anonymization where necessary.
3. **Data ownership:** The project will ensure that all data is owned by the appropriate parties and that any intellectual property rights are respected. The project will also ensure that any data sharing or dissemination is conducted in compliance with relevant regulations and guidelines.
4. **Data sharing:** The project will ensure that any data sharing or dissemination is conducted in compliance with relevant regulations and guidelines. The project will also ensure that any data sharing or

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dissemination is conducted in a manner that respects the privacy and confidentiality of the data.

5. **Data retention and disposal:** The project will implement a data retention and disposal policy to ensure that data is retained only for as long as necessary and disposed of securely when it is no longer needed.

9. Other issues

Data management in the project will be performed following the European Commission's Horizon 2020 procedures. In particular this document represents the Data Management Plan (DMP) as requested in the program and describes the data management life cycle for the data to be collected, processed, and/or generated by the project.

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References

[DIGITAL]

<https://digital-strategy.ec.europa.eu/en/activities/digital-programme>

[RESCHIP4EU]

<http://eitdigital.eu/RESCHIP4EU/>

Glossary

Community

A group of users, organised with a common purpose, and jointly granted access to resources. It may act as the interface between individual users and the resources. (see also [[WISE-SCI](#)])

AI

Artificial Intelligence

EC

European Commission

EIT

European Institute of Innovation and Technology

KIC

Knowledge and Innovation Community

GA

Grant Agreement

GDPR

General Data Protection Regulation

R&S

Research and scholarship