

AWARD
Scaling autonomous logistics

D10.5 Data Management Plan

Lead: EasyMile

Due date: 30th June 2021

Actual delivery date:
30th June 2021

Dissemination level: PU



The project has received funding from the European Union's Horizon 2020 research and innovation program under Grant Agreement No 101006817.

Document information

Project	
Project Acronym	AWARD
Project Full Title	All Weather Autonomous Real logistics operations and Demonstrations
Grant Agreement No.	101006817 - H2020-DT-ART-2020
Project Coordinator	EasyMile
Website	www.award-h2020.eu
Starting Date	January 1st, 2021
Duration	36 months

Deliverable	
Deliverable No. – Title	D10.5 – Data Management Plan
Dissemination Level	Public
Deliverable Type	Report
Work Package No. – Title	WP10 – Project Management and Coordination
Deliverable Leader	EasyMile
Responsible Author(s)	Inès Guth (EasyMile)
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Quality Peer Review	Magali Cottevaille (EasyMile)
Submission date	30th of June 2021

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ACKNOWLEDGMENT OF EU FUNDING

The project has received funding from the European Union's Horizon 2020 research and innovation program under Grant Agreement No 101006817.

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Revision history

Revision Number	Date	Author	Company	Changes
v0.1	25/06/2021	Inès Guth, David Croenne	EasyMile	Initial version
v0.2	29/06/2021	Clélia Bridier	EasyMile	Technical review
v0.3	30/06/2021	Magali Cottevieille	EasyMile	Quality review
v1.0	30/06/2021	Inès Guth	EasyMile	Final version

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List of acronyms

ADS	Autonomous Driving System
AV	Autonomous Vehicle
DMP	Data Management Plan
EC	European Commission
FAIR	Findable, Accessible, Interoperable, and Reusable
GDPR	General Data Protection Regulation
HDV	Heavy-Duty Vehicles
WP	Work Package

1. Executive Summary

The present document describes the life cycle management of the data which are anticipated to be collected, processed, and generated during the AWARD project. In order to comply with the open access to scientific publication policy in H2020 project, the present Data Management Plan was built using the guidelines on FAIR Data Management^[1].

Therefore, it includes:

- The guiding principles for data management in the project,
- The legal framework constituted by the General Data Protection Directive (GDPR^[2]),
- Data Summary: Overview of what data may be gathered and processed in the project,
- How data will be stored and processed according to the H2020 FAIR Data Management principles, making data: findable, accessible, interoperable, and reusable,
- Resource allocation: the costs of making data FAIR in this project,
- Data Security: how the consortium members intend to keep the data secure, and
- Ethical aspects: a summary of the ethics and privacy strategy in AWARD.

^[1] European Commission, Guidelines on Fair Data Management in Horizon 2020, https://ec.europa.eu/research/participants/data/ref/h2020/grants_manual/hi/oa_pilot/h2020-hi-oa-data-mgt_en.pdf, 26 July 2016

^[2] European Parliament, The Regulation (EU) 2016/679 (General Data Protection Regulation - GDPR), <https://eur-lex.europa.eu/eli/reg/2016/679/oj>, 2016

2. Data Summary

2.1. Overview of AWARD's data

The AWARD project may involve different kind of data, serving the H2020 Innovation Action. The data that may be collected or generated will be necessary to meet the objectives of the AWARD project, such as:

- research, innovation and communication purpose (surveys, interviews, workshops, videos, etc.)
- autonomous vehicles development, testing and demonstration (sensors' data, vehicle's raw data, infrastructure data, etc.)
- fleet management system development, testing and demonstration (vehicle's data, infrastructure data, traffic data, etc.)
- key performance indicators calculation (from vehicle's data).

Personal-related data may also be collected in the frame of the project. In addition to the European and national directives protecting personal data, the Consortium members have set up principles to process and protect such personal data as per Chapter 6.1.

2.2. Type and format of data

The Table 1 below provides an overview of the data that are anticipated to be processed in the frame of AWARD project. Each type of data is specified according to a list of criteria: type, format, origin, expected size, storage, purpose and re-use.

The following definitions apply to each data criteria of Table 1:

- Type of data: data category under which a given data falls,
- Format of data: type or form of support under which a given data falls,
- Origin of data: source of a given data,
- Expected size: size in KB, MB or GB which can expected from a given data,
- Storage: location where a given data is going to be stored,
- Data purpose: objective and goal of processing of a given data,
- Data re-use: whether or not the data will be considered as confidential and if so, limited stakeholders who will have access to the data.

All those types of data might contain personal data, such as defined in the chapter 6.1 and be subject to the applicable terms and conditions regarding the process of such data.

Type of data	Format of data	Origin of data	Expected size	Storage	Data purpose	Data re-use
Project data	Excel files	Surveys, questionnaires, interviews, brainstorming tools	MB	AWARD SharePoint Brainstorming tools database	Research purpose to perform the DoA	Confidential (AWARD members) Open access (scientific publications)
Scientific data	Excel files Reports (word, pdf, etc.)	Material property characterization, experimental procedures, prototype specifications	MB	AWARD SharePoint Concerned Partner's own data center	Research purpose to perform the DoA	Confidential (concerned AWARD members) Open access (scientific publications)
Autonomous vehicle's data	Excel files (raw data, bag, etc.) Videos	Autonomous vehicle tests and demonstrations (sensor's data, vehicle platform data, vehicle log data, etc.)	GB	Concerned Partner's own data center	Research purpose to perform the DoA, autonomous vehicles test and operation purpose, KPIs calculation	Confidential (concerned AWARD members)
Operational data	Reports (word, pdf, etc.) Excel files, videos	Operation site, connected infrastructure	GB	AWARD SharePoint Concerned Partner's own data center	Autonomous vehicles test and operation purpose	Confidential (AWARD members, Concerned AWARD members)

Table 1: Data qualification

2.3. Data inventory

To propose a proper monitoring of the data processed during the project, a template is put at the disposal of the Consortium members. The template enables to properly identify the data as per the criteria presented in chapter 2.2, but also to have a unique reference and detailed information on the sharing policy.

The following criteria are taken into account:

- Number: Dataset number in the list
- Dataset name: AWARD-WP[number]-T[number]-DATA-[Name] (e.g., AWARD-WP7-T7.2-DATA-vehicle-speed)
- Owner: Owner of the dataset, Subject to the compliance with the AWARD Consortium Agreement and the Grant Agreement
- Description: Description of the dataset
- Type: Personal data / Subjective data / AV data / Operational data
- Origin: Collected / generated
- Detailed origin: Exact origin of the data collected / generated
- Format: Excel / Report / Video / Other (to be detailed)
- Purpose: Purpose of the data collected/generated
- Privacy level: Public (outside AWARD's Consortium) / Consortium (AWARD's members) / Partner (AWARD's specific members)
- Sharing policy: Open (for public access) / Open with embargo which end date is dd/mm/yyyy (publication paper subject to an embargo by the publisher) / Restricted (only for AWARD's members internal use)
- Storage during the project: precision on the storage repository for Open and Restricted access
- Data destruction at the end of the project: Yes / No
- Duration of data preservation: If the data is not destroyed at the end of the project, the duration of the data preservation shall be detailed (number of years)
- Storage after the project: If the data is not destroyed at the end of the project, the storage repository shall be detailed

The Data inventory template is available in Annex 9.1.

3. Fair data

3.1. Making data findable

In the frame of AWARD project, open access (OA) research data may be made findable to the research community. In such a case, AWARD project opts for a self-archiving methodology^[3] to ensure access to scientific publications.

Subject to the compliance with the AWARD Consortium Agreement and the Grant Agreement, AWARD partners who will provide open access to publications will deposit the final peer-reviewed manuscript on a repository. While providing access to the publication, the AWARD partner will identify the bibliographic metadata, respecting the following format^[4]:

- Horizon 2020
- All Weather Autonomous Real logistics operations and Demonstrations, AWARD, Grant Agreement No 101006817
- Publication date, length of the embargo period (if applicable), persistent identifier

3.2. Making data openly accessible

Project data which will remain confidential within the Consortium and which will not be findable, will be stored in the AWARD dedicated sharepoint repository. Project data which will be made publicly available will be stored on different platforms (such as AWARD website) and on online archive tools proposed by the European Commission (EC) to grant access to the publications and to a bibliographic metadata in a standard format including information requested by the EC (refer to chapter 3.1).

As per described in deliverable D9.2 – Plan for dissemination of the results, open access will be applicable for public deliverables and scientific papers such as described in chapters 3.2.1 and 3.2.2.

3.2.1. Public deliverables

Throughout the project lifetime, a number of public deliverables may be produced as a result of AWARD activities. They will be stored on a dedicated webpage online (<https://award-h2020.eu/index.php/public-deliverables/>).

A preliminary list of platforms where AWARD may be sharing its public deliverables is as follows:

- The AWARD website

^[3] European Commission, Guidelines to the Rules on Open Access to Scientific Publications and Open Access to Research Data in Horizon 2020, 21 March 2017

^[4] European Commission, Guidelines to the Rules on Open Access to Scientific Publications and Open Access to Research Data in Horizon 2020, 21 March 2017

- ZENODO^[5], a joint CERN and OpenAIRE open-source repository of academic publications and data
- ALICE Knowledge platform^[6]
- CAD Knowledge Base^[7]

3.2.2. Scientific papers

The principle of open access may be achieved by targeting publishers that provide “gold” open access, either by making the articles immediately available online free of charge, or by having each affiliated partner to cover the relevant cost. Whenever the ‘gold’ open access model cannot be applicable, the “green” model will apply instead, by supplementary publishing the relevant articles to an online repository, in consultation with the publisher, in case that an embargo period is needed. Furthermore, many publishers also allow the publication for educational purposes of the accepted manuscript, if the version of the paper before the final editing and formulation made by the editing office is used.

The Figure 1 below summarizes the two options to grant open access to scientific publications, according to Article 29.2 of Grant Agreement^[8].

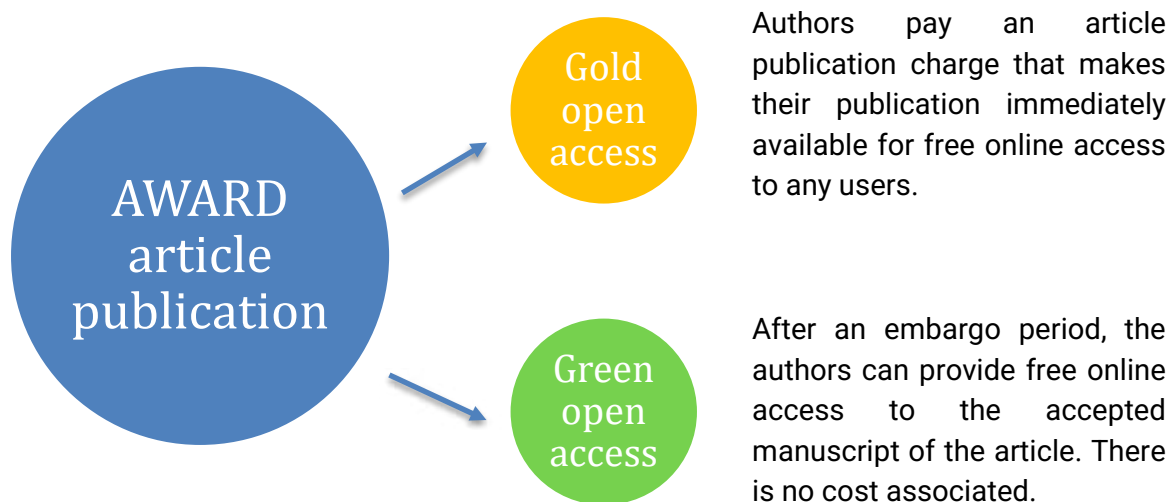


Figure 1: Open Access summary

A preliminary list of platforms where AWARD may be sharing scientific papers is provided in Chapter 3.2.1.

^[5] ZENODO, <https://zenodo.org/>

^[6] ALICE Knowledge platform, <https://knowledgeplatform.etp-logistics.eu/>

^[7] CAD Knowledge base, <https://knowledge-base.connectedautomateddriving.eu/>

^[8] AWARD, Grant Agreement, 2021

The AWARD partners strongly believe that by giving open access to our scientific publications will aim to speed up important breakthroughs by the European researchers that will lead to boost knowledge and competitiveness in Europe.

3.3. Making data interoperable

The technical Work Packages (WP3 - Design and development of autonomous driving technologies for harsh weather conditions, WP4 - Integration in heavy-duty vehicles, WP5 - Fleet management, teleoperation and logistics operation and WP7 - Testing methodology and evaluation) may use specific standards as the needs arise by the defined architecture and interfaces of the System of System as per described in the deliverable D2.1 – System scope.

The WP4 will consider standard format and protocol for V2X communication implementation between the vehicle and the connected infrastructure in the AWARD use cases which have the use of such system, as per described in deliverable D2.1 – System Scope. Figure 2 describes the different standards applied by the on-board V2X system for V2X communication.

EU STANDARDS	
Common Architecture	
Communications Architecture	ETSI EN 302 665 v1.1.1
Access	
Wireless Access in Vehicle Environment (ITS-G5)	IEEE 802.11p ETSI EN 302 571 v2.1.1, ETSI EN 302 663 v1.2.1, ETSI TS 102 724 v1.1.1
DCC	
	ETSI TS 102 687 v1.2.1
Network & Transport	
Geonetworking	ETSI EN 302 636-4-1 v1.3.1
BTP	ETSI EN 302 636-5-1 v2.1.1
Facilities	
CDD	ETSI TS 102 894-2 V1.2.1 / V1.3.1
SSEM/SREM	ETSI TS 103 301 V1.3.1
CAM	ETSI EN 302 637-2 v1.3.2 / 1.4.1
DENM	ETSI EN 302 637-3 v1.2.2 / 1.3.1
SPATEM / MAPEM	ETSI TS 103 301 v1.3.1 SAE J2735 – 2016-03
IVIM	ETSI TS 103 301 v1.3.1 ISO TS 19321 – 2015-04 ISO TS 17425 – 2016-05
CPM	ETSI TS 103 324 v0.0.18
LDM	ETSI EN 302 895 v1.1.1
Security	
Security Architecture / PKI	ETSI TS 102 940 v1.1.1 / v1.3.1
Secured message and certificate formats	ETSI TS 103 097 v1.2.1 / v1.3.1
Privacy / PKI	ETSI TS 102 941 v1.1.1 / v1.3.1
Applications	
Transit Signal Priority (TSP)	ISO TS19091 (03-2017) ESC/TS 16 157-1 – 2011-10 ESC/TS 16 157-2 – 2011-10 ESC/TS 16 157-3 – 2011-10 ESC/TS 16 157-4 – 2014-04 ESC/TS 16 157-5 – 2014-04 ESC/TS 16 157-6 – 2015-10
I2I Communications – Datex II (for RSU)	

Figure 2: V2X communication standards

The WP7 builds on the FESTA Handbook^[9] on evaluation methodology and related test campaigns. There is no specific standard commonly in use in FOT-net^[10] experiments or transport research projects which the AWARD project is building on. However, some standard

^[9] FESTA, FESTA Handbook Version 7, <https://www.connectedautomateddriving.eu/wp-content/uploads/2019/01/FESTA-Handbook-Version-7.pdf>, 2018

^[10] FOT-Net, Data Sharing Framework, <https://knowledge-base.connectedautomateddriving.eu/wp-content/uploads/2020/04/Data-Sharing-Framework-v1.1-final.pdf>, 2018

format for GPS (NMEA format) as subset of a dataset may be used, as well as weather data standard format (SYNOP format). Eventually, the WP7 will collect a set of measurement data which will be specified at a later stage in the project development.

3.4. Increase data re-use

During the project development, data will be associated with results that may have a potential for commercial or industrial protection. This data can therefore not be made accessible for verification and re-use in general due to intellectual property protection measures, as outlined in the project Consortium Agreement. Should bilateral agreements be signed between Consortium Partners, indicator data may be shared within the Consortium whereas the most sensitive data (such as algorithms or original sensors data) would be kept confidential.

However and subject to the compliance with the AWARD Consortium Agreement and the Grant Agreement, relevant data necessary for the verification of results published in scientific journals may be made open on a case-by-case basis following the Consortium embargo period of 30 calendar days after receipt of the dissemination notice. Following the Consortium members acceptance of the scientific publication dissemination, the data will either be published under a gold or green open access as per described in chapter 3.2.2.

The data in open access will remain accessible during AWARD project. After the project ends, AWARD website will be maintained for 3 years. The data in open access on other platforms will be subject to the repository's policies (such as the ZENODO's repository policies^[11]).

Data quality will be ensured by the data owner/producer who publishes the data. In case of a scientific publication, the content will be peer reviewed by the journal official publication reviewers.

^[11] ZENODO, General Policies, <https://about.zenodo.org/policies/>

4. Allocation of resources

In order to ensure the FAIR methodology in AWARD project, human resources are allocated as per described in Table 2. No specific budget is planned to be allocated to cover potential gold open access fees for the scientific publications.

Ressources	Roles	Responsibilities
David Croenne (EasyMile)	Data plan coordinator	Responsible of the Data Management Plan implementation.
Inès Guth (EasyMile)	Project manager	Responsible of the Data Management Plan update.
Annarita Leserri (ENIDE)	Open access manager	Responsible of the scientific publications for open access.
Data owner/publisher (any Consortium Member)	Quality assurance	Responsible of its dataset quality and integrity. Responsible of providing the last version of the dataset to the Open access manager for open access. Responsible of fulfilling the Data inventory template available in Annex 9.1

Table 2: Resources allocated to FAIR

5. Data security

AWARD members consider privacy and data protection as a fundamental principle and hence apply a strict policy on this matter. Data security, including data recovery as well as secure storage and transfer of sensitive data, depends on the level of confidentiality of the data, as defined in chapter 2.2.

The following guidelines will be followed to ensure the security of the data:

- Confidential data of a member:
 - storage in their own local storage or Cloud solution
- Confidential data between 2 members:
 - storage in their local storage or usual Cloud solution
 - data access shall be authenticated, data transfer shall be secured by means of secure data transfer mechanisms, such as TLS 1.22 (Transport Layer Security)
- Confidential data between all members:
 - storage in the shared AWARD SharePoint, in the corresponding folder by WP
- Public access data:
 - storage and sharing by OpenAIRE

Beside this, those guidelines shall be followed in order to limit the risk of data leaks:

- In case of local storage, store data in at least two separate locations to avoid loss of data
- In case of Cloud storage, ensure Cloud solution has a data policy against removal by error, such as a recycle bin
- Limit the use of USB flash drives
- Label files in a systematically structured way in order to ensure the coherence of the final dataset
- Following WP1 requirements, data will be pseudonymized up to the level as to not interfere with the quality of the research.

6. Ethical aspects

The WP1 ensures that ethical requirements are met for all research undertaken in the project, including data management aspects, in compliance with H2020 ethical standards. All partners shall make sure that the EU standards regarding ethics and data management ^{[12], [13], [14]} are complied with, especially the GDPR. For example, informed consent for data sharing and long-term preservation shall be included in questionnaires dealing with personal data.

6.1. Personal data

Personal data are any information relating to an identified or identifiable natural person, directly or indirectly:

- directly: name
- indirectly: identifier, number, biometric data, vehicle data, sensors...
- identification from a single data item or from the crossing of a set of data

The following data might contain personal data:

- Pictures taken on site
- People faces and vehicle plates on camera streams needed by the supervision
- Online surveys
- Distributed data gathering across partners and sites

Personal data shall only be processed in compliance with the following principles:

1. Personal data are processed lawfully, fairly and in a transparent manner in relation to the data subject ('lawfulness, fairness and transparency').
2. Personal data are only collected for specified, explicit and legitimate purposes and not further processed in a manner that is incompatible with those purposes ('purpose limitation').
3. The processing of personal data is adequate, relevant, and limited to what is necessary in relation to the purposes for which they are processed ('data minimization').
4. Obsolete or inaccurate personal data will be erased or rectified without delay ('accuracy').
5. Personal data will only be stored for as long as necessary to achieve the specified purpose ('storage limitation'). Special requirements for the processing of personal data for research purposes will be considered.
6. Technical and organizational measures will be taken to ensure that the personal data are protected against unauthorized or unlawful processing and against loss, destruction, or damage ('integrity and confidentiality').

^[12] European Parliament, Directive 2006/24/EC of the European Parliament, <https://eur-lex.europa.eu/legal-content/en/ALL/?uri=celex:32006L0024>, 2006

^[13] European Parliament, Directive 2002/58/EC of the European Parliament, <https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A32002L0058>, 2002

^[14] European Parliament, Art.29 Data Protection Working party, https://ec.europa.eu/justice/article-29/documentation/opinion-recommendation/files/2002/wp56_en.pdf, 2002

If personal data are processing, the study leader member will apply appropriate technical and organizational measures to ensure compliance with these GDPR principles of proper data processing taking into account the state of the art, the costs of implementation and the circumstances of processing ('privacy by design').

6.2. Sensible data

Sensitive data are information revealing racial or ethnic origin, political opinions, religious or philosophical beliefs or trade union membership, as well as the processing of genetic data, biometric data for the purpose of uniquely identifying a natural person, data concerning health or data concerning the sex life or sexual orientation of a natural person.

All processing of sensitive data is prohibited by principle in accordance with the GDPR. AWARD project members are not anticipating to process any sensible data. Should sensible data be process, this data management plan shall be updated and such process shall only be possible if compliant with GDPR principles.

7. Conclusion

The Data Management Plan aims at providing the proper tools and methodology applied to the management of the data that may be collected, generated, and processed in the frame of AWARD project.

The present document will be updated during the project development as new needs arise, or new rules need to be implemented to ensure the FAIR data, the proper allocation of resources, the data security and protection.

All the WP of the project are concerned by the content of the document and shall apply the guidelines in their developments. Consequently, all AWARD members (e.g., every partner of the project) must follow the DMP instructions.

8. References

- [1] European Commission, Guidelines on Fair Data Management in Horizon 2020, https://ec.europa.eu/research/participants/data/ref/h2020/grants_manual/hi/oa_pilot/h2020-hi-oa-data-mgt_en.pdf, 26 July 2016
- [2] European Parliament, The Regulation (EU) 2016/679 (General Data Protection Regulation - GDPR), <https://eur-lex.europa.eu/eli/reg/2016/679/oj>, 2016
- [3] European Commission, Guidelines to the Rules on Open Access to Scientific Publications and Open Access to Research Data in Horizon 2020, 21 March 2017
- [4] European Commission, Guidelines to the Rules on Open Access to Scientific Publications and Open Access to Research Data in Horizon 2020, 21 March 2017
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- [7] CAD Knowledge base, <https://knowledge-base.connectedautomateddriving.eu/>
- [8] AWARD, Grant Agreement, 2021
- [9] FESTA, FESTA Handbook Version 7, <https://www.connectedautomateddriving.eu/wp-content/uploads/2019/01/FESTA-Handbook-Version-7.pdf>, 2018
- [10] FOT-Net, Data Sharing Framework, <https://knowledge-base.connectedautomateddriving.eu/wp-content/uploads/2020/04/Data-Sharing-Framework-v1.1-final.pdf>, 2018
- [11] ZENODO, General Policies, <https://about.zenodo.org/policies/>
- [12] European Parliament, Directive 2006/24/EC of the European Parliament, <https://eur-lex.europa.eu/legal-content/en/ALL/?uri=celex:32006L0024>, 2006
- [13] European Parliament, Directive 2006/24/EC of the European Parliament, <https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A32002L0058>, 2002
- [14] European Parliament, Art.29 Data Protection Working party, https://ec.europa.eu/justice/article-29/documentation/opinion-recommendation/files/2002/wp56_en.pdf, 2002

9. Annex

9.1. Annex 1: Data inventory template

AWARD data inventory template

#	Dataset name	Owner	Description	Type	Origin	Detailed origin	Format	Purpose	Privacy level	Sharing policy	Storage during the project	Data destruction at the end of the project	Duration of data preservation	Storage after the project
<i>Dataset number</i>	<i>AWARD-WP[Number]-DATA-[Name]</i>	<i>Free text</i>	<i>Free text</i>	<i>Personal data / Subjective data / AV data / Operational data</i>	<i>Collected / Generated</i>	<i>Free text (precise the exact origin of the data collected/generated)</i>	<i>Excel / Report / Video / other (precise)</i>	<i>Free text (precise the purpose of the data collected/generated)</i>	<i>Public / Consortium / Partner</i>	<i>Open / Open with embargo which end date is dd/mm/yyyy (publication paper subject to an embargo by the publisher) / Restricted</i>	<i>Free text (precise storage repository for Open and Restricted access)</i>	<i>YES / NO</i>	<i>Free text (number of years)</i>	<i>Free text (precise storage repository for Open and Restricted access)</i>

