



Smart2B

Smartness **to** existing Buildings

UPGRADING SMARTNESS OF EXISTING BUILDINGS THROUGH INNOVATIONS FOR LEGACY EQUIPMENT

Deliverable 9.4

Data Management and System Failure Management Plan

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Table of Contents

1. Introduction.....	9
1.1 Structure of the Project Management Plan.....	9
2. Data Set Description Methodology	11
3. Ethics, Privacy and Security	14
3.1 Ethics Requirements	14
3.2 Data Privacy and Personal Data	16
3.3 Data Security	17
3.3.1 Procedures for Sensitive Data Storage and Transfer.....	17
4. Data Management, sharing and open access	18
4.1 Data Handling and Management.....	18
4.2 Sharing and Open Access	20
4.3 Document Management	21
5. Data Curation and Preservation.....	22
6. Allocation of Resources	23
7. Conclusions	24
8. References	25
Annex I – Guidelines for WP6 Activities and Consent Form Template.....	26



List of Figures

Figure 1 : Template for Responsibility Assignment Matrix to track responsibilities	19
Figure 2 : Smart2B research data sharing process and IPR protection	21

List of Tables

Table 1 –Template for the characterization and description of the data sets	11
Table 2 –Template to specify the physical instances of the data set	13
Table 3 – Template for data handling and management summary	19
Table 4 – Template for data curation and preservation	22
Table 5 – Human resources allocated	23



Abbreviations and acronyms

Abbreviation	Definition
CORDIS	Community Research and Development Information Service
DMP	Data Management and System Failure Management Plan
DPO	Data Protection Officer
DOI	Digital Object Identifier
EC	European Commission
FAIR	Findable, Accessible, Interoperable and Re-usable
GDPR	General Data Protection Regulation
IPR	Intellectual Property Rights
ORDP	Open Research Data Pilot
PC	Project Coordinator
WP	Work Package



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Executive Summary

This document presents the deliverable D9.4 – Data Management and System Failure Management Plan (DMP) of the H2020 project Smart2B. The present deliverable establishes the framework under which Smart2B consortium will monitor, generate, process and collect data during project’s life cycle (that extends beyond the project duration) in compliance with the EC rules. Additionally, D9.4 will tackle how the data will be exploited or made accessible for verification and re-use, how the data will be curated and preserved after the project is completed, as well as the standards to be applied in this context.

The current document corresponds to the first version of Smart2B DMP, composed by the preliminary information and framework, that will be then updated in M24, August 2023 (D9.6).

All Smart2B outputs, such as deliverables, datasets and the other publications will be named and indexed properly, and efforts will be made to promote the Open Access policies through the communication of the technological and scientific results on the Project official website.

The data related activities will comply with the General Data Protection Regulation requirements as well as the EC rules. Smart2B participates in the Pilot on Open Research Data in H2020, and hence it will take the appropriate actions to ensure that the project complies with the Findable, Accessible, Interoperable and Re-usable (FAIR) principles.



1. Introduction

Data Management and System Failure Management Plan (DMP) of Smart2B will present the methodology that should be used to define and collect the data sets to be generated or acquired, its origin, nature, and scale, as well as for whom it could be useful, and whether it underpins a scientific publication or not, is described. Additionally, information and guidelines on the reuse of the data are also detailed.

The DMP covers the entire research data life cycle and must be consistent with exploitation and Intellectual Property Rights (IPR) requirements. Hence, research data linked to exploitable results will not be put into the open domain if they compromise the consortium's commercialisation prospects or have inadequate protection, which is also a H2020 obligation. Particularly, sensitive data provided by consortium partners for the demonstration phase and personal data of the users will be kept strictly confidential and anonymized, i.e., secured in a way to maintain compliance with General Data Protection Regulation (GDPR).

This document was prepared based on the Horizon 2020 FAIR DMP template [1], which promotes the principle: publicly funded research data is a public good and as such, it should be made available whenever possible and with the least possible restrictions. Together with the project ambition of "Open by Default", Smart2B is, indeed, part of the European Commission (EC) Open Research Data Pilot (ORDP), adhering to all its conditions [2]. This DMP aims to guide the project partners towards specifying:

1. What data will be collected, processed and/or generated;
2. The handling of research data during and after the end of the project;
3. Which methodology and standards will be applied;
4. Whether data will be shared/made open access;
5. How data will be curated & preserved.

1.1 Structure of the Project Management Plan

Deliverable 9.4 is structured as follows:

- Chapter 2 – Data Set Description Methodology: presentation of the methodology that will be used to identify and characterise the different data sets that will be generated or acquired, their origin, purpose and its relation to the objectives of the project, as well as the type and format of the data. Furthermore, this methodology will describe the data sets in terms of communication protocols and involved hardware and software;
- Chapter 3 – Ethics, Privacy and Security: constituting ethical, privacy or legal issues that can have an impact on data sharing and handling. The processes for recruitment of participants are outlined and data privacy and issues regarding personal data are presented.
- Chapter 4 – Data Management, Sharing and Open Access: contextualising the data handling descriptions, procedures and access rights to publications and data sets, the principle of Open Research Data and Open City Data as well as the document management system;
- Chapter 5 – Data Curation and Preservation: presenting the procedures and processes on the curation and preservation of the generated data sets within and beyond the project's life cycle.



- Chapter 6 – Allocation of resources: definition of the specific Project resources employed to the implementation of the procedures and guidelines defined in this PMP;
- Chapter 7 – Conclusion: addressing the main highlights of this deliverable.



2. Data Set Description Methodology

As the Smart2B project is in the initial phase of its implementation, it is not possible yet to define a list of the data that will be generated/acquired during the project execution, since relevant activities towards data sets' identification are still being carried out in:

- WP1 – Specifications and Requirements for Smart2B Concept;
- WP2 – Development of Smart2B Devices & Building Interface;
- WP3 – Development of Smart2B Platform & APIs;
- WP4 - Development of Smart2B Services;
- WP5 – Development of Smart2B User Interaction, Client Engagement & Social Innovation;
- WP6 – Demonstration and Evaluation in five diverse Pilots.

Nevertheless, in WP1 deliverables, where the requirements and specifications of Smart2B concept will be defined, information about which data sets are expected to be generated/acquired in Smart2B project developments will be given. These details include the definition of a set of use cases (D1.4) for each of the Smart2B pilots according to which the data sets to be collected during the demonstration phase can be specified (D1.7). The final description of the data sets to be generated/acquired will be included in the updated version of the D9.6 in M24 (August 2023).

The data sets that are expected to be generated/acquired in the Project should be properly characterized and described. In this context, one excel tool, that comprises two tables will be made available for the Consortium use, with the following objectives:

- Characterization and description of the data sets: in Table 1 should be included standardised items under which every data set will be classified;
- Specification of the physical instances of the data set: in Table 2 should be specified the physical instances, including building, origin equipment/tool, repository equipment/tool as well as communication between origin and repository and access rights.

In order to make this tool accessible for all the Consortium, the excel tool will be stored in Smart2B collaborative online tool (in WP9 folder). Following, the rules to fill the developed tool are described (Table 1 and 2):

Table 1 –Template for the characterization and description of the data sets

Data set ID	Data set Name	File name	WPs related	Pilot name	Responsible Partner	Relation to project objectives	Data Type	Data format	Description of the data set	Origin of the data set	Personal Data
DS ₁											
DS ₂											
...											

- 1st column: indicates the 'Data set ID'. The ID of the data set shall be a unique identifier of the individual data set and shall ensure proper cataloguing of the data set;
- 2nd column: indicates the 'Title of the data set', that shall be self-explanatory regarding the nature and purpose of the data set;
- 3rd column: the 'Filename' under which the data set will be stored/archived/curated is specified;



- 4th column: specifies the WPs for which the data set is generated or acquired;
- 5th column: the Pilot name corresponding to the data set is specified. Here, it shall be distinguished between residential, commercial/service, and public buildings;
- 6th column: indicates the consortium Partner(s) and/or contact person(s) responsible for the data set;
- 7th column: the 'Relation to the project objectives' is detailed. The relation adheres to the 6 specific objectives of Smart2B:
 1. Implement a community-enabled smart readiness platform – Smart2B platform;
 2. Equip the Smart2B platform with automated data analyses capabilities, including statistical/machine learning, big data analytics, predictive analysis, and AI methods;
 3. Integrate different types of legacy equipment, smart appliances and IoT sensors via the SMART2B devices;
 4. Develop user-centred Smart2B services to improve the smartness of existing buildings;
 5. Develop and integrate the Smart2B user interaction and interfaces as well as a gamification component;
 6. Demonstrate how the Smart2B devices, Smart2B platform and Smart2B services achieve the upgrade of smartness of existing buildings;
- 8th column: the 'Data type' of the data set is indicated. The expected data types include: integers; booleans, characters; floating-point numbers, alphanumeric strings or others (to be specified).
- 9th column: specifies the 'Data format' of the data set, that are expected to include (but are not limited to):
 - ASCII text-formatted data (TXT);
 - CAD data (DWG);
 - Comma-separated values (CSV);
 - dBase (DBF);
 - eXtensible Mark-up Language (XML);
 - Tab-delimited file (TAB);
 - JavaScript Object Notation (JSON);
 - Geospatial open data based upon JSON (GeoJSON);
 - Geo-referenced TIFF (TIF, TFW);
 - Hypertext Markup Language (HTML);
 - Keyhole Markup Language (KML);
 - MS Word (DOC/DOCX);
 - MS Excel (XLS/XLSX);
 - MS Access (MDB/ACCDB);
 - OpenDocument Spreadsheet (ODS);
 - Open Document Text (ODT);



- Rich Text Format (RTF);
- SPSS portable format (POR);
- **10th column:** details the 'Description of the data set', that shall be clear and precise so that each data set can be distinguished from the others by the information enclosed. It may be sufficient to introduce keywords in context with the data set description, which allow to identify each data set individually. The characterisation of the data sets based on keywords may allow the use of database tools, such as SQL to organise, maintain and access the data sets during Smart2B project;
- **11th column:** indicates the 'Origin of the data', which shall indicate how the data was collected and what kind of equipment was used to obtain the data set;
- **12th column:** it is specified whether the data is personal (traced back to an individual entity) or not. This characteristic shall help to identify sensitive data in terms of GDPR as well as requirements emanating from ethical, data privacy and security considerations at the point where it is generated/acquired.

Table 2 –Template to specify the physical instances of the data set

Data set ID	Building	Origin equipment/tool	Repository equipment/tool	Communication between origin and repository	Type of access (confidential or public)
DS ₁					
DS ₂					
...					

- **1st column:** indicates the 'Data set ID'. The ID of the data set shall be a unique identifier of the individual data set and shall ensure proper cataloguing of the data set. It must be one of the entries in Table 1.
- **2nd column:** the 'Building' shall specify the building type where the data set was collected from.
- **3rd column:** specifies the 'Origin equipment/tool' from which the data set is collected, generated, or acquired.
- **4th column:** the 'Repository equipment/tool' shall specify the devices used to receive, store, and process the data.
- **5th column:** indicates the 'Communication between origin and repository' used to send/receive the data from the origin to the repository.
- **6th column:** indicates the 'Access level' to specify whether the data set is confidential or public.



3. Ethics, Privacy and Security

The Smart2B project involves carrying out data collection (in the context of the piloting and validation phase in WP6) and a set of large-scale validation tests to assess the technology and effectiveness of the proposed framework in real life conditions. For this reason, human participants will be involved in several aspects of the project and related data will be collected in a privacy preserving way. This will be done in full compliance with any European and national legislation and directives relevant to the country, where the data collections are taking place, moreover, where the data set is curated and preserved. Participation in the project will be entirely voluntary and all participants will have the opportunity to ask questions and receive understandable answers before deciding whether to participate. No data will be collected without the explicit informed consent of the individuals under observation unless there is one legal basis to do otherwise (the exemptions are listed in Article 6 of the GDPR).

To cope with the different nature of the data sets, methodologies to address ethical requirements as well as data privacy and security are of utmost importance to establish a general framework in this heterogenous data environment. The following three subsections will detail the different methodologies and principles used to address privacy and data protection issues raised by the project's activities, that should be considered and applied for all the Consortium Partners.

3.1 Ethics Requirements

The internal ethical agenda of Smart2B follows the guidelines of various expert communities in the field of data ethics (e.g. the European group on ethics in science and new technologies to the European Commission). The ethical agenda includes a code of conduct to specify correct behaviour and corresponding principles in relation to data collection and processing. The following six principles are contemplated and addressed within Smart2B ethical code of conduct:

1. **Ownership:** Who is the owner of the data? Individuals own their private data;
2. **Transaction transparency:** What access is given to the owner and how transparent is the access? Transparent access for the use of the individual's personal data has to be established and the individuals should have full and transparent access to the algorithms used to and generate and aggregate the data sets;
3. **Consent:** Which individuals or other entities need to give consent to use the data? Individuals or other entities shall be explicitly informed of what personal data moves to whom, when and for what purpose;
4. **Privacy:** What efforts and measures are in place to ensure data privacy? In terms of data collection, the project partners are obliged to invest all reasonable effort to guarantee the privacy preserving and protection of data according to the EU and national data protection regulations;
5. **Currency:** If applicable, what is the financial value of the personal data and how is that communicated with the owner of the data? Individuals shall be explicitly informed of any financial transactions resulting from there data;
6. **Openness:** How much of the aggregate data sets are freely available? (if applicable, under adherence to point 1. – 5. aggregate data should be freely available for the owner of the data.

Adherence to these principles will ensure the responsible and sustainable use of the data generated and processed in Smart2B. The ethical code of conduct shall further serve as a complement to the mere compliance with data protection laws and current regulations



(referred in the next subsection). In fact, the code of conduct of Smart2B shall reflect a principle that promotes honesty and genuine transparency in data management.

Additionally, any data generation/acquisition involving humans will be strictly held confidential at any time. This entails into the following three practical actions that each project Partner shall obey while interacting with volunteers and/or individuals:

1. **Volunteer participants recruitment:** research participants will be recruited for the residential pilots and, eventually, for office building pilots when/if building zones with permanent single occupants or permanent small groups of occupants are considered. The recruitment will be carried out by the pilot owners, based on the participants free and voluntary willingness to participate in the project pilot. The briefing and information provided shall be conducted in the volunteers' native language. All potential participants will be provided with clear information on the project and will be asked to give consent in writing. To this end, an informed consent procedure will be adopted, in accordance with EU and relevant national regulations.
2. **Informed consent procedure:** Whenever there will be a collection of personal and/or sensitive data, the persons involved should sign a consent form under which they accept the use of these data only in the context of the project that is specified in the consent form. Informed consent forms will be employed in the language of the potential participants and in terms easily understandable. Additionally, and before signing the informed consent, participants will receive information about the Smart2B project aims, the research activity that will take place, the expected results and the limits of the research, as well as the six principles of the code of conduct presented in this document. The purpose is to ensure that participants fully understand the implications of being involved in the research, the protection mechanisms in place and on the right to refuse to participate and to withdraw the participation and data. The hard/electronic copies of the informed consent forms (and the personal data they contain) will remain confidential. Only a very limited number of persons will have access to them, and the associated data will not be available for publication or disclosure. A template of a consent form to be adopted is provided in Annex I, as well as a detailed methodology and guidelines to deliver the informed consent in WP6 activities.

Since Smart2B Pilots comprises buildings where the majority of the occupants are children's (Santa Casa da Misericórdia de Lisboa Buildings), special attention should be given to these cases, and specific procedures shall be followed: in all cases where the person is not capable of giving consent, informed consent of parents/legal representative will be obtained. When the child reaches the age of majority during the execution of the project, the Smart2B Consortium will obtain his/her consent to continue the study and pilot activities. The child's refusal to participate or continue participating in the research will always be respected. The consent forms for parents/legal representatives and for children will be separated and in accordance with the age of the children, accordingly with the following rules:

- Information for children five years and under should be predominantly pictorial;
- For pre-adolescent information sheets should explain briefly and in simple terms the background and aim of the study, so the child can consider assent. It also should contain an explanation that their parents will be asked for consent;
- An adolescent is no longer a minor as defined in national law, or is an "emancipated minor", then written informed consent will be required from these individuals.



1. **Information about the protection mechanisms that will be applied:** Ensure volunteers that no personal or sensitive data will be centrally stored without appropriate anonymization and encryption mechanisms. In addition, the volunteers shall be informed about the data security measures in place (see subsection 3.3 Data Security) to avoid potential identification of individuals.

3.2 Data Privacy and Personal Data

Smart2B will engage different building typologies collecting multiple sets of data and carrying out various measurements of data per building. Hence, the Project stakeholders as well as the occupants affected by the data collection will vary from building to building. The Consortium is fully aware of the privacy and data protection issues that might arise, declaring its strict compliance with all European and national legislation and directives relevant to the country where the data collections are taking place. The collection, processing and transmission of personal data will be analysed under principles of:

1. The GDPR (Regulation (EU) 2016/679);
2. The Universal Declaration of Human Rights and the Convention 108 for the Protection of Individuals with Regard to Automatic Processing of Personal Data;
3. The applicable national laws.

Additional regulations at national level that do not fall under the GDPR and apply to data protection or any other sensitive information will also be taken into account.

The Project will respect the privacy of all stakeholders and citizens and follow a stakeholder management procedure assuring that stakeholders and citizens are fully informed about their rights, the objective and handling of their data. The stakeholder management procedure obliges the Project Partners to obtain consents where personally identifiable data is collected and processed as described above, implementing suitable data handling procedures and protocols to avoid potential identification of individuals. This will include participants' data sets in activities that use techniques such as interviews, questionnaires, workshops, or mailing lists as well as building, energy, and mobility data collection.

Data managed during the project will be processed only under the following preconditions which need to be met:

1. When the data subject has given her/his consent;
2. When the processing is necessary for the performance of or entering into a contract;
3. When processing is necessary for compliance with a legal obligation;
4. When processing is necessary in order to protect the vital interests of the data subject.

To this end, personal data managed within Smart2B will be anonymized and stored in a form which does not permit identification of users. Smart2B will establish a data management framework that guarantees security of collected personal data from potential abuse, theft, or loss. Privacy and security mechanisms will be embedded in the Smart2B platform design and configured appropriately for the specific privacy requirements of distinct data sources.

The majority of research data generated by the project will be made public & will be offered, with the exception of the personal user data.

This DMP establish the guidelines that the project partners shall obey when data is generated/acquired, transferred and stored, as well as preserved and curated.



3.3 Data Security

A fundamental task that contributes to Project success is to manage the data in a secure way. All shared, processed and operational data will be stored in secure environments at locations with access privileges restricted only to the relevant project Partners. Smart2B Consortium will undertake all required efforts needed to protect the data, products and services against unauthorized use. The primary responsibility to take necessary measures to ensure data security lies with the Project Partners.

For each data set, which should be classified accordingly with the guidelines described in Chapter 2, the Partners will state the provisions and measures to be implemented to ensure data security, privacy and ethical requirements.

The secure management of information will adhere to the guidelines of relevant standards (e.g. ISO/IEC 27001 and 27002; Code of practice for information security management) to ensure the triad of cyber security:

- **Confidentiality** – Preventing unauthorised disclosure of information;
- **Integrity** – Assuring that data cannot be modified in an unauthorised manner;
- **Availability** – Making information available for authorised users.

The information security management will further contain the Directive on security of network and information systems ('Cybersecurity directive', NIS-Directive 2016/1148) on the security of critical infrastructures and the ePrivacy Directive 2002/58, as well as European Union Agency for Network and Information Security (ENISA) guidance. Storage of information will fully comply with the national and EU legal and regulatory requirements.

3.3.1 Procedures for Sensitive Data Storage and Transfer

Whenever data was collected/generated or stored in Smart2B Project activities by a Consortium member, a person responsible for overseeing that data are safe and secure should be appointed. The collected/generated data must be securely stored and regularly backed-up. For large datasets that need to be stored in large capacity hard drives, multiple copies should be made to avoid data loss in case of hardware failure. These multiple copies should be also stored at different locations, but always stored in the online collaboration tool of the Project (SharePoint). The dedicated project repository, that was created in this platform is only accessible by authorized consortium partners (i.e. via username and password login). Further access restrictions on specific folders may be enabled, if needed.

The indicative guidelines presented bellow shall be followed in order to ensure the security of the data:

1. Keep anonymized data and personal data of respondents separately;
2. Store data in at least two separate locations to avoid loss of data;
3. Limit the use of portable storage (i.e. USB flash drives and optical disks);
4. Label files in a systematically structured way in order to ensure the coherence of the final dataset.

Besides using data anonymisation techniques (such as data masking, pseudonymisation or data swapping), Smart2B will promote data encryption and backup distribution dealing with sensitive data of individual stakeholders. Moreover, the goal of these measures will be to ensure that data remains consistent over the lifetime of the Project and there exist alternatives to the main files, in case they disappear or get corrupted. The encryption component adds an extra layer of security to the data files and information.



4. Data Management, sharing and open access

Smart2B will implement a comprehensive data management system complying to the ethics, privacy and security considerations and facilitating a swift processing between the project participants. After the data sets have been generated/acquired, the procedures of how the data is managed shall ensure trackability, transparency and usability among the consortium partners. In general, Smart2B DMP details 4 different categories of data generated or acquired in the project:

1. **Research data** – Includes all the data necessary to evaluate the quantitative KPIs of the project and the data required to the results presented in public deliverables or scientific publications. The Consortium strongly believes in and applies the concepts of open science, and benefits arising from the European innovation ecosystem and economy by facilitating the reuse of data at a larger scale. The DMP covers the entire research data life cycle and must be consistent with exploitation and IPR requirements. Hence, research data linked to exploitable results will not be put into the open domain if they compromise its commercialisation prospects or have inadequate protection, which is also a H2020 obligation. The Project Coordinator will be responsible to ensure that provisions on Scientific publications and guidelines on Data Management in H2020 are adhered to. As indicated, scientific research data should be findable, accessible interoperable and reusable (FAIR) to ensure it is soundly managed beyond the original purpose for which it was collected.
2. **Operational and observational data** – Comprises all the data, raw data generated/acquired as well as curated data during the implementation, testing and operation of the demonstration activities (operational data), and data from qualitative activities including surveys, interviews, fieldwork data or engagement activities (observational data, such as the one that will be collected under WP1 and WP6 activities on citizen engagement). Particularly, sensitive data provided by consortium partners for the demonstration scenarios and personal data of individual stakeholders will be kept strictly confidential to protect their competitive advantage and in terms of personal data anonymised and secured to maintain compliance to GDPR.
3. **Monitoring and evaluation data** – All the data related to the monitoring of project specific KPIs to track the performance of project. This data will be regularly reported and published in relevant repositories in an open way for the project.
4. **Documentation, instruments and reusable knowledge** – Includes the data and documentation produced by Smart2B Consortium, comprising specific documentation of the project, as well as data resulting from demonstration and implementation activities, such as tools, equipment, instruments, software, and underlying source code. The DMP covers the entire research data life cycle and must be consistent with exploitation and IPR requirements. In terms of public results, sufficient and consistent documentation and publication will support the project's dissemination activities. All public deliverables will be published on the project website in Open Access.

4.1 Data Handling and Management

This DMP follows the EU guidelines [1] and describes the data management procedures according to the FAIR principles. The acronym FAIR identifies the main features that the project research data must have in order be findable, accessible, interoperable and re-useable, allowing thus for maximum knowledge circulation and return of investment. To implement FAIR Data Management, Smart2B will facilitate the use of a data handling system following the template presented in Table 3.



Table 3 – Template for data handling and management summary

Data set ID	Short Description	Purpose and relevance of data collection and relation to objectives	Methodology	Data Source/Data ownership	Standards/ data formats/ vocabularies	Storage	Security and privacy considerations	Exploitation & Dissemination	Dissemination Level /Limitations/ Approach/Justification	Stakeholders

The proposed template will serve as a guideline to detail the description, purpose and relevance of the data sets as well as the methodology and collection procedure used to obtain them. Furthermore, the data management system allows to complement the general information enclosed in Table 1 and Table 2, by addressing the question of ownership, which standards are applicable, how the information is stored and what data security and privacy considerations shall be taken into account/apply.

For data sets that are further used in publications and/or deliverables as a result of a Project deliverable, the corresponding dissemination level and the stakeholders involved in that deliverable shall be also detailed. In case the prediction of whether a data set will be published as part of a deliverable or not, the responsible consortium partner shall update the status of each data set as soon as this can be foreseen.

To ensure the trackability and transparency of responsibilities related to the data sets, the concept of a Responsibility Assignment Matrix will be adopted, including the required adaptations to be used in the data management context. In following Figure 1 presents the concept of this approach.

Partner Name Data set ID	Partner1	Partner2	Partner3	...
DS ₁	C	R,G		
DS ₂	R	C	G	
DS ₃	G	R	C	
...				

R Responsible

G Gatherer

C Curator

Figure 1 : Template for Responsibility Assignment Matrix to track responsibilities

The template developed for Responsibility Assignment Matrix aims to be a tool to track the Partners responsibilities related to the generated/acquired data sets (making the link with the data set ID of Table 1 and Table 2), including, at least, the following three forms:

- **Responsible (R)** - responsible to track the data set through its entire life cycle during Smart2B Project and beyond. The data set Responsible shall further liaise with the Gatherer and Curator to ensure transparency and compliance of all activities concerning the data set;
- **Gatherer (G)** - including all the tasks related to the collection or generation/acquisition of the data set. The Gatherer shall assure that the data is collected in an appropriate way and complying to the general procedures stated in the DMP;
- **Curator (C)** - responsible to archive and, if applicable, preserve the data set during the project and 5 years after the project's completion. The Curator is further



responsible to ensure that the guidelines on data curation and preservation detailed in the following section are implemented (e.g. appropriate storage of data set in repository, costs in relation to data curation, etc.).

In any case, the information and data gathered and elaborated will be appropriately described in the respective deliverables. All public deliverables will be made available and archived on the project website and through the EU Community Research and Development Information Service (CORDIS) for the project. The project aims to make research data and publications that comply with the ethics, privacy and security considerations freely available through Open Access and suitable repositories.

4.2 Sharing and Open Access

The activities within Smart2B will include a number of public deliverables as well as scientific and other publications. The Consortium will provide timely open access to research data in project-independent repositories and provide the link to the respective publications, to allow the scientific community to examine and validate the results based on the underlying data.

The policy for open access to research data and publications follows the H2020 Guidelines to Open Access. It is the will and commitment of the partners to share non-commercially sensitive knowledge and experience with the city socioeconomic sector to ensure learning is transferred and errors are not repeated. The Smart2B Consortium 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 and have committed to allocate specific budget to ensure and encourage the academic partners to publish research results as Gold Open Access.

Whenever possible, processed data that will be shared externally to the Consortium will be deposited in the dedicated project website repository (smart2b-project.eu) and in most cases, to comply with H2020 Open Access Mandate [3], into the [European Commission Funded Research \(OpenAIRE\) Community](#) as well as in [Smart2B Community](#) in Zenodo [4]. The uploads in Zenodo, or any other similar open repository are assigned with a Digital Object Identifier (DOI), to make them citable and trackable. Archiving the datasets at an open repository guarantees a long-term and secure preservation of the data at no additional cost to the project. Following are presented the upload instructions in Zenodo:

- Create a profile in Zenodo to be able to upload files;
- Search for "Smart2B_H2020Project" under the "Communities" tab at the top of the Zenodo site;
- On the Community site, click the "New upload" button in the top right corner and insert the requested data and confirm the upload.
- Remember to add the European Commission community in the box labelled "communities". You can use the search function to locate the community and add it. The data will then automatically be uploaded to both communities;
- Data upload should be done as soon as possible and at the latest on article publication. Data, and the "Data Owners" are responsible for uploading datasets generated by them.

Additionally, the policy for open access to research data adopted in Smart2B is presented in the Figure 2.

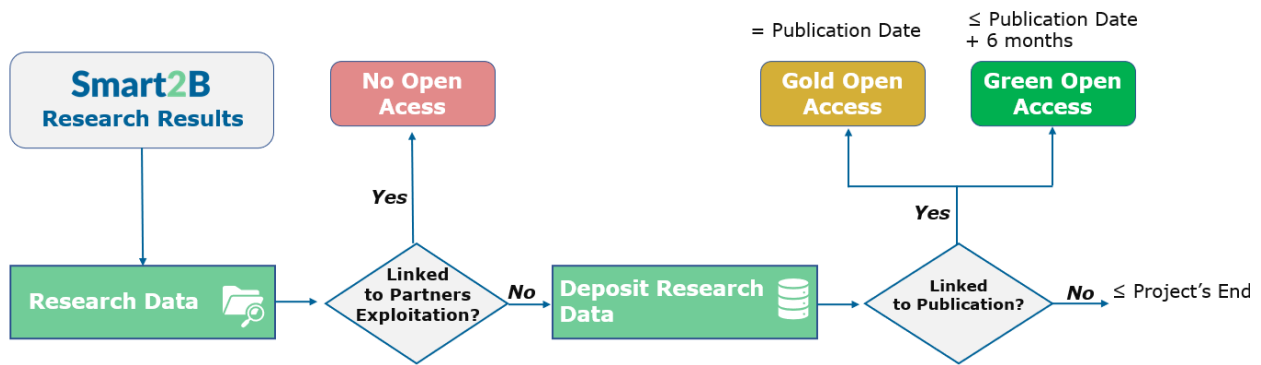


Figure 2 : Smart2B research data sharing process and IPR protection

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.

In any case, the Project Coordinator will be responsible for the final decision regarding which data should be made accessible from outside the consortium in open repositories accounting for IPR issues, ethics and their value to the research community.

4.3 Document Management

All documents and files generated within the Smart2B will be handled in a project specific collaborative Tool, SharePoint (cloud Platform) set up by the Project Coordinator to ease the collaboration and increase transparency among the various consortium partners to locate and access the project documentation. The naming and terminology of the shared files and documents should follow a rigid structure agreed on by all Consortium Partners, addressed in D9.1 – Project Management Handbook.

The Partners are responsible that the documents and files they upload are complying to the overall guidelines laid-out in this deliverable. The partners are advised to coordinate the sharing of sensitive documents with the Smart2B Ethics Manager and Data Protection Officer (DPO).



5. Data Curation and Preservation

In this chapter the procedures for the long-term curation and preservation of the data are described. The procedures defined will indicate how long the data shall be stored, where it will be stored and what costs are associated with it.

Public deliverables will be published and curated on the project website while internal data sets will be backed up to allow recovery for re-use and/or verification. Primary data will be archived for a minimum of years, to be determined still, by the data owner/Partner generating the data.

The classification system presented in Table 4 shall facilitate appropriate measure for the data curation and preservation procedures.

Table 4 – Template for data curation and preservation

Data set ID	Repository		Long-term preservation plan			
	Storage Locatio	Type of repository	Time period	Approximated volume	Storage repository	Associated costs for preservation
DS ₁						
DS ₂						
...						



6. Allocation of Resources

In order to ensure the proper implementation of the procedures and guidelines defined in this PMP, Project human resources are allocated as per described in Table 5.

Table 5 – Human resources allocated

Resources	Roles	Responsibilities
Nuno Mateus (EDP)	Project Coordinator (PC)	<ul style="list-style-type: none"> - Ensure the implementation of the Data Management Plan in Smart2B - Responsible for the Data Management and System Failure Management Plan update
Daniel Reis (EDP)	Data Protection Officer (DPO)	<ul style="list-style-type: none"> - Responsible to ensure the Consortium's compliance with the laid-out data protection and privacy measures
Daniel Albuquerque (EDP)	Ethics Manager	<ul style="list-style-type: none"> - Responsible to check that all Smart2B activities follow the ethics, privacy and security considerations defined in PMP
Data owner/publisher (Any Consortium Member)	Quality assurance	<ul style="list-style-type: none"> - Responsible of its dataset quality and integrity - Responsible for fill the templates/tools provided by PC, including: characterization and description of the data set, physical instances of the data set, handling and management summary, Responsibility assignment Matrix, data curation and preservation



7. Conclusions

This deliverable presents the first version of Smart2B Data Management and System Failure Management Plan. Formal approval and release of this deliverable within the Consortium constitutes a formal commitment by Partners to adhere to the data management strategy and the procedures it defines.

The DMP is a living document that will be refined as the Project evolves and new information on data collection, generation and handling arise. Day to day data management will be implemented through the use of the online tools described in this document, as well as through continuous collaboration among Project Partners.

This first version of the DMP presents an innovative way to deal with the Data Handling and Management, presenting an adapted Responsibility Assignment Matrix, identifying the roles of Responsible, Gatherer and Curator, for each Smart2B data set.

Smart2B Project Management Team will regularly reflect with the Consortium members in order to refine the procedures and guidelines defined in this document, which updates will be then included in a revised and extended version of this deliverable, prepared in M24, August 2023 (D9.6), that will also include detailed data set descriptions for the activities within that period.



8. References

- [1] The Open Research Data Pilot of the European Commission. <https://www.openaire.eu/what-is-the-open-research-data-pilot>
- [2] Guidelines on FAIR Data Management in Horizon 2020. Version 3.0, 26 July 2016. https://ec.europa.eu/research/participants/data/ref/h2020/grants_manual/hi/oa_pilot/h2020-hi-oa-data-mgt_en.pdf
- [3] Guidelines to the Rules on Open Access to Scientific Publications and Open Access to Research Data in Horizon 2020. Version 3.2, 21 March 2017. http://ec.europa.eu/research/participants/data/ref/h2020/grants_manual/hi/oa_pilot/h2020-hi-oa-pilot-guide_en.pdf
- [4] Zenodo Platform. <https://zenodo.org>



Annex I – Guidelines for WP6 Activities and Consent Form Template

The consent procedures will be carefully determined and managed by WP6 that will manage the demonstration activities which will be performed in the selected pilot buildings. Thus, it will require the enrolment of people voluntarily declaring their consent to participate in each of the demonstration activity. However, the design of the observational study will be prepared in strict collaboration with the DPO of the Smart2B Consortium, in order to respect privacy and ethical issues implied by the data to be collected and analyzed. In particular, the consortium will take the appropriate action for excluding that:

1. Data can be collected without the explicit informed consent of people under observation; no person unable to express a free and informed consent for ongoing medical and / or psychological conditions, mental incapacity, will be enrolled in the study;
2. Data collected may be sold or used for any different purposes from the Smart2B project;
3. Any data, which is not strictly necessary to accomplish the current study, will be collected; data minimization policy will be adopted at any level of the project and will be supervised by the ethical/privacy component of the project;

Additionally, any shadow (ancillary) personal data obtained in the course of the observation will be immediately cancelled. However, we plan to minimize as far as possible this kind ancillary data. Special attention will be also paid to comply with Council of Europe's Recommendation R(87)15 on the processing of personal data for police purposes, Art.2: "The collection of data on individuals solely on the basis that they have a particular racial origin, particular religious convictions, sexual behavior or political opinions or belong to particular movements or organizations which are not proscribed by law should be prohibited. The collection of data concerning these factors may only be carried out if absolutely necessary for the purposes of a particular inquiry". Some sessions between technical and ethical components of the project will be devoted to this.

The consent procedure for the pilot use case realization at each of the selected pilot sites will be obtained through a two-stage procedure:

- a) Initially, each pilot responsible beneficiary will orally present the pilot to people that will be involved, carefully describing the level of privacy infringement that the execution of each of the pilot realization involves. In case someone wants to exercise his/her right not to know, he/she will be excluded from the pilot.
- b) Secondly, after a few days, subjects will be required to read and sign an informed consent form that will explain in both plain English and in local language what the trial leader has already orally explained. The informed consent forms in English and in local language to be used will be sent to the European Commission and included in the experimental protocol.



Smart2B

Smartness to existing Buildings

Consent Form

Project Purpose

- A commonly understandable written description of the project and its goals even for people that are not familiar to the project scope (2-3 paragraphs).

Project Progress Schedule

- The progress schedule of the project and the related testing and evaluation procedures (1-2 paragraphs).

Disclaimer Rights

- Advice on unrestricted disclaimer rights on their agreement.

Voluntary Participation Form

1. General Information:

- Participant basic information,
- ID (reference code) of the participant, which will be used throughout the pilot trial execution.

2. Study Information:

- Details about the demonstration

3. Participant's Questionnaire:

- has been fully informed on the purpose, duration, procedures of the study
- has been informed on the rights to deny participating or to quit from the study and about the corresponding consequences;
- has been informed on the contact person in case that I have questions and queries about the study,
- had adequate time to make my decision concerning my participation in the study;
- comprehend that he/she can quit from the study at any time without having to justify his/her decision;
- has been informed about potential effects, difficulties and dangers;
- has been informed about the sensors equipment that will be used to collect data
- has been informed about the security of the study data and results;
- has been ensured about the confidentiality of his/her personal information. Publications of the study results do not allow the personal data recognition, due to the principle of anonymity. Always under the confidentiality principles.

4. Signed Consent to Participate

- A signed consent of the participant allowing the study responsible to examine and inspect the data collected during the study.