MED Food TTHubs - Trace & Trust Hubs for MED Food

Grant Agreement No 1931

D1.5 Data Management Plan (update)

Lead Beneficiary: CERTH

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0.03	02/12/2020	CERTH	Report's update
0.04	07/12/2020	CERTH	Report's update based on partners input
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Abbreviations

ACRONYM	*DEFINITION*
DMP	Data Management Plan
DMPO	Data Management Portal
FAIR	Findable, Accessible, Interoperable and Re-usable
GDPR	General Data Protection Regulation
IPR	Intellectual Property Rights
OA	Open Access
PC	Project Coordinator
TL	Task Leaders
WPL	Work Package Leaders

Executive summary

The current report constitutes the Data Management Plan (DMP) of the MED Food TTHubs project and describes the data management processes to be followed throughout the duration of the project, along with the methodology applied to guarantee the FAIR provisions for data management. It builds on GDPR guidelines and provides information about the data to be collected/generated throughout the MED Food TTHubs activities, as well as details about the procedures to be followed in order to make this data openly accessible.

More specifically, this document focuses on the recommendation to the project's partners on how to collect, generate, manage and re-use the MED Food TTHubs data. Moreover, it specifies how data and research publications will be collected, processed, monitored, catalogued, and disseminated during the project lifetime, as well as after the end of the project. Finally, it defines the data management responsibilities, sets the premises on data security and provides an estimation of the resources to be allocated, so as to make the data FAIR.

Introduction

European-funded projects such as MED Food TTHubs usually produce large sets of data during their lifetime. Depending on the discipline, the data could derive from various sources such as laboratory testing, field trials, social science research and various observations. One of the major problems in these kinds of projects is the uncertainty of what will happen to the data after they are analysed and the project has finished. In fact, the majority of data created can be of high value for other researchers, but because they are either stored on local servers and/or miss crucial metadata, their potential value is lost.

In this context, all partners of MED Food TTHubs's consortium adhere to sound data management principles in order to ensure that the meaningful data collected, processed and/or generated throughout the duration of the project are well-managed, archived and preserved, in line with the Guidelines on Data Management in Horizon 2020.

Along these lines, the DMP aims to achieve the following objectives:

- Describe the data management lifecycle for the data to be collected and/or generated in the framework of MED Food TTHubs, serving as the key element of good data management.
- Outline the methodology employed to safeguard the sound management of the data collected, and/or generated as well as to make them Findable, Accessible, Interoperable and Re-usable (FAIR).
- Provide information on the data that will be collected and/or generated and the way in which it will be handled during and after the end of the project along with the standards applied to this end.
- Describe details on how the data will be made openly accessible and searchable to interested stakeholders as well as its curation and preservation.
- Present information on the resources to be allocated so as to make data FAIR clearly identifying the responsibilities pertaining to data management and considering data security across the entire lifetime of data.

With the above in mind, this version of the DMP is structured in 6 distinct sections, as follows:

- Section 1 outlines the purpose and objectives of the MED Food TTHubs activities, which ultimately lead to the data collection and generation processes. In addition, it presents data types and formats, origin, expected volume and relevant stakeholders that might utilise the data.
- Section 2 describes the processes followed in order to ensure FAIR data management during the entire lifecycle of the MED Food TTHubs.
- Section 3 provides an estimation of the resources required to ensure FAIR data management and defines the respective responsibilities.

- Section 4 outlines the data security strategy followed by MED Food TTHubs, along with the implemented secure storage procedures.
- Section 5 presents the next steps foreseen for updating the DMP.
- Section 6 summarises the conclusions of this document.

The DMP is not a fixed document. Like a living document, it evolves within the duration of the project and **will be further elaborated and enriched when required.** Although this report already covers a broad range of aspects related to the MED Food TTHubs data management and the procedures implemented within the MED Food TTHubs project consortium, updates will be realised whenever significant changes arise. The potential updates will include new data, changes in the methodology or other aspects relevant to their management (such as size of data, etc.), changes in Consortium policies and plans or other potential external factors. A first version of the DMP will be submitted by M9, to be continuously updated when necessary, until the end of the project, as part of WP1.

1. Data summary

In order to accomplish its objectives, MED Food TTHubs will collect, produce and re-use data including data as defined in the General Data Protection Regulation (GDPR). This data is quantitative, qualitative or a mixture of both and will be investigated from various points of views and methodological approaches to provide valuable information that will effectively meet project's activities and objectives.

This chapter of the DMP defines the purpose of the data collected/generated under the framework of MED Food TTHubs along with an initial description of data types and possible formats, their origins and concludes with an overview of data that is expected to be produced/used throughout the project's lifecycle.

1.1. Purpose of data collection/generation and its relation to the objectives of the project

Effective achievement of the MED Food TTHubs purposes involves a variety of activities under which a series of data will be collected and produced. This process guarantees the production of efficient and evidence-based outcomes. With this in mind, each data collecting/generating process is matched with the respective objective and activity of the project that corresponds.

In this context, the main project's activities that involve data collection/generation are the following:

- **In-depth analysis of current state of agri-food chains structures, traceability and authenticity processes**, through a detailed review of existing methodologies for assessment and analysis of Mediterranean food-chain environment sustainability and the determination of best practices of trace and track of food. This will map the current state in Mediterranean agri-food chains structures, traceability and authenticity processes and identify current practices, as well as any issues, needs, gaps and opportunities in the respective field.
- **Analysis of the current practices and needs of key stakeholders through a survey**, which will shed light on current practices and approaches followed in Mediterranean countries, while also define the requirements of key users, with a view to guiding the development of the MED Food TTHubs e-platform.
- **Analysis of the ideas and feedback collected during the MED Food TTHubs Focus Groups**, which will enable the review of current approaches in agri-food sector and provide valuable insights for the optimal development of the MED Food TTHubs e-platform.
- **Analysis of the ideas, experiences and opinions collected during single Interviews to Stakeholders**, which will support the review of current approaches in agri-food sector and

provide valuable insights for the optimal development of the MED Food TTHubs e-platform.

- **Analysis, integration and validation of critical characteristics of food products**, which will enable the development and operation of a full-path Traceability Protocol for agri-food products.
- **Analysis and technical design of the e-Platform**, including software requirements, architectural design artifacts, modeling of workflow and data flow procedures, and activity and process flow diagrams.
- **Deployment of the MED Food TTHubs platform and its services**, where data will be collected/generated from the utilisation of the platform.
- **Monitoring, evaluation, and validation of MED Food TTHubs's pilots**, in order to improve and fine-tune the design of the MED Food TTHubs e-platform and protocols, based on feedback collected by the key stakeholders participating in the project's pilot activities.
- **Improvement and validation of the business models** designed for the market exploitation of the MED Food TTHubs e-platform, by collected feedback from MED Food TTHubs Focus Groups and stakeholders.
- **Monitoring and assessment of the dissemination and communication results of the project**, with a view to measuring the impact of the relevant activities.

1.2. Types and formats of collected/generated data

MED Food TTHubs is set to utilise collected/generated data of different structure and format. As a result, the data definition process can be based on the source and the physical format of the data. In this context, two key elements can be defined:

- the procedure under which the relevant information is produced, which may incorporate the use of digital text documents and electronic reports, spreadsheets, online surveys and records, among others, and
- the storage format of quantitative and qualitative data, which may involve easily available and accessible formats, such as post scripts (e.g. pdf, xps, etc.), machine-readable formats (xml, html, xhtml, rdf, json, etc.), spreadsheets, (e.g. xlsx, csv, etc.), text documents (e.g. docx, rtf, txt, etc.), compressed file formats (e.g. rar, zip, gzip, etc.) or any other format that is necessary in order to fulfil the purposes and methodologies applied by the activity within which the data are generated.

Higher priority should be given in using file formats that do not need the use of commercial software or a particular operating system, when possible, to improve the interoperability and re-use of the data generated throughout MED Food TTHubs activities. As a result, project's data will be easily readable and could be used free in any software used by the interested third parties.

1.3. Origin of data

New data will be produced/used by MED Food TTHubs consortium, as well as external stakeholders using the MED Food TTHubs e-platform or being involved in the related activities throughout project's duration. With that in mind and apart from consortium members, the external stakeholder groups from which new data will originate include:

- Specialised laboratories, which can validate the authenticity and the trace of a food product
- Competence Centres, which will provide know-how, R&D services for applied innovations in food traceability
- Technology Providers, which will provide state-of-the-art solutions in various fields such as Internet of Things, Blockchain, Non-destructive testing
- Consultants, which will facilitate the application of innovative approaches concerning cultivation, postharvest, food processing, packaging and logistics
- Quality Auditors, which will certify quality assurance programs at farms, packing houses, processing facilities, logistic companies
- Governmental Authorities and certification bodies, which will act as auditors and regulators of the supply chain
- Users of the specialised services in LVC (e.g. producers, cooperatives, SMAEs, food processor companies, logistic providers, sellers) and in GVC (e.g. wholesalers, retailers, food services providers, restaurants, etc.)
- Data owners and providers.

1.4. Data overview

There are several types of data that will be created, gathered, and/or acquired within the project's duration. Most of the partners will be handling data in one way or another, therefore this concrete Data Management plan would offer clarity, transparency and a proper documentation to all the partners that are involved. Along these lines, Table 1 presents an overview of the type of data, the possible formats, sources and description, along with the benefits that could arise by utilizing this data.

Table 1: Data overview

Nº	Name of activity	Type of data	Format of data	Description & Purpose	Utility
1	In-depth analysis of current state of agri-food chains structures, traceability and authenticity processes	Desk research | Qualitative and categorical data	.docx, .ppt, .pdf, .xlsx	A detailed analysis of the current state-of-play concerning agri-food chains, traceability and authenticity processes offering meaningful insights about gaps, needs and opportunities in these fields	Provide inputs for building the MED Food TTHubs e-platform and protocols, with a view to establish a robust value proposition of the project
2	Analysis of the current practices and needs of key stakeholders through a survey	Quantitative data from web-based survey	.xlsx	Data that will be collected through the survey conducted in the context of MED Food TTHubs, which aim at revealing the needs and requirements of the e-platform's users, as well as shed light on current traceability practices.	Facilitate the design and development of a user-friendly e-platform for traceability and authenticity
3	Analysis of the ideas and feedback collected during the MED Food TTHubs Focus Groups	Transcripts from input during the meetings	.docx	Data that will be collected during Focus Group meetings.	The respective discussions, ideas, and relevant feedback are expected to be used in order to facilitate e-platforms design and fine-tuning project's results.
4	Analysis of ideas, experiences and opinions collected during Interviews with Stakeholders	Transcript during the phone/virtual call	.docx	Data that will be collected during individual phone or virtual calls.	Opinions emerging from Interviews will complete and support analysis foreseen in WP2 activities
5	Analysis, integration and validation of critical characteristics of food products	DNA sequences, isotopic concentrations, and nutritional values	.txt, .docx, .xlsx, fasta	Data that will be collected in the lab performing the relative analysis and from the package and relative info for each product	The data will be used for the development of the traceability pathway

Nº	Name of activity	Type of data	Format of data	Description & Purpose	Utility
6	Analysis and technical design of the e-Platform	Modelling artifacts	.docx, .ppt, .vsd, PNG, PDF, SVG, EPS, TIFF, GIF, JPEG	Software requirements, architectural design artifacts, modelling of workflow and data flow procedures, and activity and process flow diagrams	Support the implementation, monitoring and documentation of the Authentication and Quality Assurance Protocol concerning the entire product lifecycle
7	Deployment of the MED Food TTHubs platform and its services	GS1 data, REST API data, QR codes, Barcodes	.json, .xml, .log, .xlsx, PNG, PDF, SVG, EPS, TIFF, GIF, JPEG	Data structure, data base records, data analytics, charts, log files, IoT data	Support the operation and maintenance of the e-Platform
8	Monitoring, evaluation, and validation of MED Food TTHubs's pilots	feedback on Pilot activities (e.g. pilot operation logs / data concerning selected KPIs / general feedback)	.xlsx, .docx, .pdf	Pilot users and Focus Group members who will participate in the pilot activities of MED Food TTHubs will provide feedback regarding possible improvements and modifications of the e-platform.	The analysis of this data will indicate the potential to enhance e-platform's outcomes.
9	Improvement and validation of the business models	Feedback from the focus groups and interviews of stakeholders (qualitative data).	.docx	Elaboration on the previous results of data collection. An in-depth analysis of the regulatory framework in the seven involved countries.	Analysis of data to improve and validate the establishment and operation of the business model for the 7 TTHubs, and to develop public-private partnership model.
10	Monitoring and assessment of the dissemination and communication results of the project	Social media statistics | Quantitative and qualitative data (e.g. No of unique visitors, followers, posts/tweets, etc.)	.xml (exportable in different formats, including .cvs, php, rss, .xlsx, html, .pdf)	Data will be collected/generated through periodic monitoring of the project's social media statistics (including website, Facebook, Twitter, LinkedIn and YouTube) with a view to	Analysis of this data will provide valuable feedback indicating possible ways to improve dissemination activities results to reach the project's targets.

Nº	Name of activity	Type of data	Format of data	Description & Purpose	Utility
				measuring and assessing the performance and results of the project's social media activity in terms of dissemination and communication.	
		Qualitative & quantitative data collected from dissemination events (e.g. no. of participants, copies of promotional material distributed, lists of participants, presentations, photos, etc.)	.docx, .pdf, .ppt	Brochures, newsletters, project reports, journal/magazine articles, conference, presentations/posters, scientific publications, public deliverables for dissemination of the project.	Written and printed material will be produced in cases such as conferences, meetings and other public events. Additionally, publications and deliverables will be publicly available (except for confidential deliverables).
		Newsletter subscriptions	.xslx	The data will be comprised of a list of stakeholders along with their basic contact information: (i) email address, (ii) first and last name, (iii) country, (iv) type of organisation	

2. FAIR data

The European Commission has highlighted the importance of making the data produced by European-funded projects **Findable, Accessible, Interoperable and Reusable (FAIR)**, with a view to ensuring its sound management, as well as boosting the dissemination of relevant information and the easy exchange of data within the EU state members. Thus, EU's FAIR data approach implements standards and metadata to make data discoverable, specifying data sharing procedures and which data will be open, allowing data exchange via open repositories as well as facilitating the reusability of the data.

The following sections of the DMP lay out the methodology followed in the framework of MED Food TTHubs with respect to making data findable, accessible and interoperable, as well as ensuring their preservation and open access, with a view to increasing its re-use.

2.1. Making data findable, including provisions for metadata

2.1.1. Data discoverability and identification mechanisms

MED Food TTHubs emphasises on improving the discoverability of data produced/used during its activities. In this context, the project follows a metadata-driven approach to improve the searchability of data, while at the same time supporting its interpretation and re-use.

To this end, data produced/used as part of the activities of MED Food TTHubs can be identified with metadata relevant to its content and format. The project uses metadata that follow a standard identification mechanism for the development of rich and reliable metadata to promote the long-term discovery, usage and integrity of its data (see Subsection 2.3 for more information on the metadata standards adopted by MED Food TTHubs).

2.1.2. Naming conventions

Following a standard approach of naming conventions, data searchability can be improved significantly. In this context, MED Food TTHubs creates clear data file names that integrate information regarding their content, status, and versioning, while also improving their discoverability. In doing so, consortium members and interested stakeholders can easily identify, organise and sort the relative data.

MED Food TTHubs employs a standard naming convention that has been decided by all members of the consortium and can be found in D1.1 “Project Handbook” that was submitted on month 3 of the project’s duration.

2.1.3. Search keywords

The project’s data will be provided with easy-to-use search keywords in order to maximise its re-use by interested stakeholders throughout project’s lifecycle. With that in mind, keywords, as a subset of metadata, are used to add valuable information to the data collected/generated facilitating its discoverability and correlation to the MED Food TTHubs project.

In this regard, the project strategy on keywords is based on the following principles:

- The who, the what, the when, the where, and the why should be covered.
- Consistency among the different keyword tags needs to be ensured.
- Relevant, understandable and explicit keywording should be followed.

2.1.4. Versioning

Versioning of information is a standard procedure within the project, which makes a revision of datasets uniquely identifiable, thus, enabling to keep track of the work done. More specifically, data versioning is used to define whether and how data changed over time, as well as to explicitly identify which version the creators / editors are working with. In addition, effective data versioning makes it easier to understand whether an updated version of a dataset is available and which changes are made between the different versions, allowing comparisons and avoiding confusion. In this context, a clear version number indicator is used in the naming convention of every data file produced during MED Food TTHubs to facilitate the identification of different versions.

2.1.5. Standards for metadata creation

With the use of rich metadata standards, searchability and discoverability of the collected/generated dataset is ensured in the context of MED Food TTHubs. In particular, for each type of data that is produced/used and is considered significant to be used within the project, metadata will be created accordingly. This method results in an efficient search, enhanced digital curation and simple data sharing, while the standards implemented make it possible to incorporate metadata from a wide range of sources into other technological systems. Each partner will be responsible for the type of metadata used according to the respective data created/used in their project activities.

2.2. Making data openly accessible

2.2.1. Openly available and closed data

Data produced/used during the MED Food TTHubs project will be offered to the Open Research Data Pilot, in which MED Food TTHubs has declared its intention to participate. Thus, it becomes apparent that the majority of research data collected/generated/used by the project will be made open. To do so and to protect the confidentiality and privacy of the stakeholders that contributed in the collection/generation of this data, data anonymization will be employed to relevant datasets when necessary.

2.2.2. Data accessibility and availability

Data accessibility is a priority within the MED Food TTHubs project. Thus, all data will be publicly available, apart from the cases that certain data cannot be shared, e.g., personal data, confidential information, trade secrets, etc. When data need to be shared under restrictions, a proper justification will be provided. In addition, in the cases where confidentiality of data is required, data will be closed and an alternative solution will be provided. It is worth mentioning that all

personal data will be treated as closed data prior to their anonymization and processing in order to protect their confidentiality.

The following table presents which data of the project will be openly available or strictly closed and provides detailed information on data accessibility.

Table 2: Data accessibility and availability

Nº	Type of data	Level of Accessibility	Availability	Justification
1	Data about the current state-of-play	Public	Open	Some confidential data regarding specific methodologies and companies' information and trade secrets will be classified as closed.
2	Web-based survey	Public	Open	Any personal information will be aggregated/anonymised before being made openly available.
3	Ideas and feedback collected during Focus Groups meetings	Confidential	Closed	For obtaining trust from participants, it has been guaranteed that the information discussed will not be public in any way and will be used only for the fulfilment of R&D purposes of the project.
4	Individual Interviews	Confidential	Closed	For obtaining trust from participants, it has been guaranteed that information discussed will not be public in any way and will be used only for the fulfilment of R&D purposes of the project.
5	Analysis, integration and validation of critical characteristics of food products	Public	Open	The public can build trust by tracing the supply chain.
6	Direct data input by users to the e-platform	Confidential	Closed	During the development and the evaluation of the e-platform data will be entered by the partners in the platform for testing purposes. The unprocessed data will not be public.

Nº	Type of data	Level of Accessibility	Availability	Justification
7	Analysis and technical design of the e-Platform	Public	Open	The software design document is classified as a "PU" public document.
8	Data generated from the e-platform's services	Public	Open	The information that will be provided through the e-platform generally will address the public.
9	Feedback on MED Food TTHubs' pilots	Confidential	Closed	Feedbacks collected from the Focus Group members and pilot users during the evaluation process will serve internally to the improvement of the e-platform operation. Even though, data gathered through pilots will be handled and reported in an aggregated form, without any reference to personal data or confidential information, and after anonymisation of the data under WP6's (PU) deliverables.
10	Data collected from business models' validation processes	Confidential	Closed	Data will be kept confidential, used only for the purposes of completing the project activities, and will not be used in any way that can identify names of participants. Confidentiality and/or anonymity will be maintained. The findings from the project activities and research will only be used in aggregate with the responses of all other participants.
11	Social media statistics	Public	Open	Any personal information data will be aggregated/anonymised before being made openly available.
12	Data collected from dissemination events	Public	Open	All printed material will be used for the dissemination of the project, so that it

N°	Type of data	Level of Accessibility	Availability	Justification
				will receive recognition and attract interest. Any personal data collected during these events will be treated as expected by the GDPR.
13	Newsletter subscriptions	Confidential	Closed	This data will remain closed as it contains personal information and is useful only for internal reporting purposes.

* **Public**: fully open, e.g. web | **Confidential**: only for PRIMA, EC and project partners | **Open**: available for re-use free of charge | **Closed**: accessible only to members of the consortium

2.2.3. Data sharing

After the data have been generated/acquired, the procedures of how it is managed ensure trackability, transparency and usability among the consortium partners. The data is diversely curated depending on the sharing policies attached to it. For both open and closed data, the aim is to preserve the data and make it readily available to the interested parties for the whole duration of the project and beyond.

As mentioned, all documents and files generated within the project are stored and shared in the open-source project management software "Freedcamp" to ease the collaboration and increase transparency among the various consortium partners to locate and access the project documentation. Freedcamp is administered by the project's Coordinator who ensures the separation of data access rights based on the participants' role to minimize the potential of unauthorized dissemination of confidential data. The services offered by Freedcamp are free of charge and enable peers to share and preserve research data and other research outputs in any size through well-established security practices. Thus, Freedcamp represents a very suitable choice for project management, since being employed to coordinate the project's activities and to store all the digital material connected to MED Food TTHubs.

Deliverables are classified based on their dissemination level, i.e. public or confidential as stated in the Grant Agreement. The policy for open access to research data and publications follows the H2020 Guidelines to Open Access and article 29 of Grant Agreement. 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. It is the will and commitment of the partners to share non-commercially sensitive knowledge and experience.

Particularly, confidential information provided by consortium partners for the demonstration scenarios and personal data of individual stakeholders will be kept strictly closed to protect their competitive advantage and in terms of personal data anonymised and secured to maintain compliance to GDPR. Therefore, the Consortium ensures the security of confidential data and deliverables.

On the contrary, public deliverables will be made available on the project's website in open access. At the current stage of the project and data generation, the public data has been made accessible by website visitors. The aim of this data openness and exploitation will be to speed up the potential of the wider use of project's outcomes and results within the ecosystem and ensure their optimal use after project's completion. As it is analysed below, open access encourages the re-use of research results and creates a fair and open environment for them.

2.3. Making data interoperable

Data interoperability refers to the ability of systems and services that create, exchange and use data to have clear, shared expectations for the contents, context, and meaning of that data. MED Food TTHubs has adopted in its data management methodology the use of metadata vocabularies, standards, and methods that will increase the interoperability of the data collected/generated through its activities.

More specifically, standard vocabularies will be used for all data types present in the project. In case there is an uncommon vocabulary, a clear mapping will be provided in order to facilitate its use. Thus, the project's data will be interoperable and easy for sharing among researchers, institutions and organisations.

2.4. Increase data re-use

2.4.1. License schemes to permit the widest use possible

The use of a license to MED Food TTHubs' open data is a basic method applied to guarantee that any interested third party can re-use it. In this respect, licences are the tools, which allow an interested third party to copy, share, display and/or make changes on the project's information only for the purposes specified by the licence.

In accordance with this, MED Food TTHubs expects to release its openly available data based on a common licence scheme, such as the Creative Commons scheme, in order to encourage their re-use and create a fair and open environment for them.

In order to efficiently meet the need of MED Food TTHubs' open data, different licensing schemes may be applied to ensure not only their long-term preservation and re-use, but also the interests

of the consortium along with the rights of individuals for whom the data is about. Thus, some of the data might need to be held as confidential for an amount of time. When necessary, this subsection of the DMP will be revised accordingly.

The data will be stored in Freedcamp, the selected data repository, which is described in a separate section below, for all the duration of the project, and for a further five years after the completion of the project. This time will be extended if justifiable lawful grounds exist, e.g., the data storage is necessary for compliance with the requirements of the project funding body.

2.4.2. Availability for re-use

Making data available for reuse is a core aspect of the MED Food TTHubs' FAIR data management approach. Data re-usability assures that apart from project participants, key stakeholders can also leverage from this information and contribute to increasing the impact of the project. Rich metadata created on the basis of standards that enable proper identification, as well as acceptable licensing schemes, encourage the re-use of MED Food TTHubs's open data, enabling them to find valuable utility.

The expected timeframe that data will become available for reuse will be defined among the project consortium.

3. Allocation of resources

3.1. Estimated costs of making data FAIR

The subsequent costs emerged from the FAIR data management process are integrated within the budget of MED Food TTHubs.

In this respect, all publications related to the research conducted during the project, will be submitted to scientific journals that comply with an open-access policy, and the fees will be covered by the budget allocated by the Grant to the MED Food TTHubs project.

3.2. Data management responsibilities

Efficient, proper and safe processing of the collected/generated data throughout MED Food TTHubs, involves the implementation of specific data management roles within the project's data management methodology and procedures. These responsibilities are outlined in this section.

- **Project Coordinator** (PC): The PC, CERTH, is responsible for overall data management in the framework of MED Food TTHubs, including the elaboration of the DMP. At the same time, the PC is responsible for the elaboration of proper templates for the informed

consent form and information sheet to be appropriately adjusted and utilised by project partners during the relevant activities of the project. Finally, the PC coordinates with Work Package and Task Leaders to determine whether and how the data produced/used by the project are shared and become available for re-use, contributes to its quality assurance.

- **Work Package Leaders** (WPL): The WPL is responsible for coordinating the implementation of the data processing activities performed under the WPs they are leading. They align with the PC and the respective Task Leader on whether and how the data gathered/produced under the tasks that fall within the WP they are leading will be shared and/or re-used. Finally, the WPL are the main responsible for assuring the quality of the data stemming from the activities of the WP they are leading, including assessing their quality and indicating any need for improvement to the respective Work Task Leaders.
- **Task Leaders** (TL): The TL act as data controllers of the data collected/generated in the frame of the tasks that fall under their leadership, determining the purposes and means of processing this data as well as safeguarding its appropriate and timely processing. Moreover, they are responsible for properly adjusting the templates for the informed consent form and information sheet to the needs and specificities of the activities carried out in the task they are leading. Finally, they undertake any necessary actions to prepare the data produced/used through the tasks they are leading for sharing either within the consortium or openly (including the use of proper naming conventions, application of suitable anonymisation techniques, the creation of appropriate metadata and documentation, etc.).
- **Data repositories**: Data repositories are tasked with the storage and long-term preservation of the project's data. To this end, the consortium will use the **Freedcamp** management platform, as a repository for data safekeeping, accessible. All the deliverables containing accessible as well as confidential data will be uploaded and stored there. Freedcamp's security mechanisms will ensure that the data is safely stored for a long period even after the completion of the project. The handling of Freedcamp as a repository, as a general management platform and as all data management is preferred in the first stage of the project. The management of Freedcamp related to the project is under the responsibility of the coordinator.

4. Personal Data Protection

As personal data processing can pose various types of negative implications to the data subjects, it is of primary importance for all the necessary safeguards to be put in place in order to ensure the necessary level of protection. For this reason, the project has envisaged a clearly defined framework to abide by all data protection considerations.

4.1. Data protection legislation

Within MED Food TThubs data is collected and processed in order to implement the project tasks and to enable proper information exchange and communication in the project. Since the project includes partners from all over Europe, Egypt, Jordan, and Tunisia, an interplay between different legal acts is observed. Although the project's activities will be implemented under the umbrella of the Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data ("GDPR") and other applicable European legislation and policies such as the Charter of Fundamental Rights of the EU, the European Convention on Human Rights, Convention for the Protection of Individuals with regard to automatic processing of personal data (CETS 108), and the European Commission's Ethics and Data Protection.

4.2. Data protection commitment

The Consortium is committed to perform the project in compliance with the GDPR and any applicable data protection legislation. Data is reused in the project context and is mainly used internally and is not open to a wider public if personal data are involved. Accordingly, in order to ensure compliance with the GDPR provisions, the consortium partners have agreed to include specific clauses in the Consortium Agreement. Therefore, partners provide a signed declaration of compliance with applicable European and national data protection legislation, including EU 2016/679 General Data Protection Regulation (Appendix I).

4.3. GDPR applicability

The GDPR lays down rules for the protection of personal data. These rules must be observed by all beneficiaries when they process personal data of data subjects established in the EU. Processing is defined by Art. 4(2) GDPR as "any operation or set of operations which is performed on personal data or on sets of personal data, whether or not by automated means". Examples include the "collection, recording, organisation, structuring, storage, adaptation or alteration, retrieval, consultation, use, disclosure by transmission, dissemination or otherwise making available, alignment or combination, restriction, erasure or destruction" of data.

4.4. Personal data

According to Article 4(1) of the GDPR 'personal data' means "any information relating to an identified or identifiable natural person ('data subject'); an identifiable natural person is one who can be identified, directly or indirectly, in particular by reference to an identifier such as a name,

an identification number, location data, an online identifier or to one or more factors specific to the physical, physiological, genetic, mental, economic, cultural or social identity of that natural person".

4.5. Sensitive personal data

Special categories of personal data (called "sensitive personal data") include data that reveals: "racial or ethnic origin, political opinions, religious or philosophical beliefs, or trade-union membership, genetic data, biometric data for the purpose of uniquely identifying a natural person, data concerning health or data concerning a natural's sex life or sexual orientation (Article 9 of the GDPR). Processing of such information is in principle prohibited, except in specific circumstances. It is highlighted that within the project there is no collection and processing of such categories of data.

4.6. Data protection principles

Project follows the fundamental principles relating to processing of personal data. These are:

1. lawfulness, fairness, and transparency (Art. 5(1a)).
2. purpose limitation – data shall only be collected for specified, explicit and legitimate purposes and not in a way, that is incompatible with these purposes (Art. 5(1b)).
3. data minimisation – data collection shall be adequate, relevant, and limited to the necessary (Art. 5(1c)).
4. accuracy – data shall be accurate and kept up to date (Art. 5(1d)).
5. storage limitation – data shall be kept in a form which permits identification of subjects for no longer than is necessary (Art. 5(1e)).
6. integrity and confidentiality – data shall be processed in a way that ensure appropriate security of the personal data (Art. 5(1f)).
7. accountability – the controller shall be responsible for following the above principles (Art. 5(2)).

4.7. Lawfulness of data processing

The processing of all personal data shall always be based on a legal basis according to article 6 of the GDPR. When the legal ground for personal data processing is consent by the data subject, the latter shall be provided all information laid down in article 13 and 14 of the GDPR at the time when the data are obtained. Therefore, project partners obtain informed consent by providing a detailed Information Sheet companied with a Consent Form to all data subjects whose data will

be processed (see Appendix II). Mainly, an information sheet is provided on interviews, surveys, workshops, and pilots defining the level of personal information collected and the usage of the data. Participants are asked for consent to personal data processing before being able to continue with the interview, survey, workshop, or pilot. The collection of personal data is restricted to the minimum needed following the recommendations of the GDPR regulation. In general, participants are asked to provide name, contact details (e.g., email) and affiliation, in order to enable communication in case of non-anonymous participation. Where possible anonymous surveys are implemented.

4.8. Data processing for research purposes

Data processing for research purposes is subject to the conditions and safeguards set out in Article 89(1) of the GDPR. Appropriate measures must be taken for the rights and freedoms of data subjects. In particular, the principle of data minimisation must be respected by taking appropriate technical and organisational measures such as pseudonymisation or anonymisation of data. However, the measures should not frustrate the achievement of the research purposes. Appropriate measures could consist of the encryption of data during transmission, confidentiality agreements, the selection and concrete design of data access. According to Article 89(2) of the GDPR the Union or national legislature can adopt further derogations to the rights in Art. 15, 16, 17 and 21 GDPR. These exemptions are, again, subject to the conditions and safeguards of Art. 89(1) of the GDPR being met. They are justified only insofar as the rights under Art. 15, 16, 18 and 21 GDPR are likely to frustrate or seriously prejudice the achievement of the research purposes and such exemptions are necessary for the fulfilment of those purposes.

4.9. Data security

Security of personal data is one of the core obligations arising from the GDPR. It is mandated in Article 5 (integrity and confidentiality principle) and concretised in Article 32 of the GDPR. According to the latter article, the data controller shall "ensure a level of security appropriate to the risk". The GDPR follows a risk-based approach, i.e., the higher the risk, the more rigorous the measures that must be taken in terms of data protection. Data controllers must reflect the risks of their respective processing and take the measures adequate to the risk to achieve the highest possible level of security. To this end, certain organisational and technical security measures may have to be taken, such as:

- Pseudonomysation: dissolving the personal reference of data to such an extent that it is only possible to draw conclusions about a specific person by consulting additional information.

- Encryption: the personal reference is retained in principle, but cannot be read without a suitable key;
- Confidentiality: information must be protected against unauthorized disclosure and sensitive data must be made accessible only to authorized persons.
- Integrity: the manipulation of data is prevented, i.e., information is protected from undergoing unauthorized modification.
- Availability: the ability to restore the availability and access to personal data in a timely manner in the event of a physical or technical incident.
- Resilience of systems and services processing personal data: the system must be able to cope with hazardous situations, in particular not to fail in the event of disruptions but to maintain its performance.
- A process for regularly testing, assessing, and evaluating the effectiveness of technical and organisational measures for ensuring the security of the processing, etc.

Project partners are engaged in adopting the appropriate security measures for the protection of personal data in compliance with the GDPR. They shall employ all possible organisational and technical security measures instrumental in achieving this objective.

Such security measures may include:

- A register of the IT resources used for the processing of personal data (hardware, software, and network), including type (server, workstation, …) and location.
- communication and awareness of the responsibilities and obligations related to the processing of personal data.
- an access control system and authentication mechanism for all users accessing the IT system using complex passwords.
- implementation of security settings, such as anti-virus applications, use of authorised software applications, session time-outs when the user has not been active for a certain time period, regular security updated.
- encrypted communication through the Internet (TLS/SSL).
- backup and data restore procedures.
- appropriate management of mobile/portable devices.
- software based overwriting prior to media disposal (alternatively, physical destruction).
- physical access to the IT system only by authorised personnel, etc.

4.10. Project data controllers and joint controllership

The responsibilities arising from the GDPR are directed at the data controller which is the “natural or legal person, public authority, agency or other body which, alone or jointly with others, determines the purposes and means of the processing of personal data” (Art. 4(7) GDPR). On the

other hand, data processor is the "natural or legal person, public authority, agency or other body which processes personal data on behalf of the controller" (Art. 4(8) GDPR). Processor is only responsible for the technical execution of the decisions taken, while the controller is authorised to give instructions and has the power to decide on the purposes and means of the processing. However, processor has his own duty of documentation (Art. 30(2) GDPR) and shall be jointly and severally liable with the controller for damage suffered by the data subject (Art. 82 GDPR).

Joint controllership occurs when two or more controllers jointly determine the purposes and means of processing (Art. 26(1) GDPR). They must jointly determine which of them fulfils which obligations under the GDPR and are liable for this to the data subject. The essence of the arrangement shall be made available to the data subject.

Each partner which introduces personal data to the consortium and enables other project partners to access and process such personal data within the project will act as a data controller for the introduced personal data and commits to comply with the applicable European and national data protection legislation, and to follow the relevant dispositions and requirements specified on the Grant Agreement and Consortium Agreement of the project.

4.11. Data transfers

Transfer of personal data from a data controller to a data processor must be secured by a data processor agreement. It must meet certain minimum requirements, as set forth by Article 28 of the GDPR. The contract must stipulate that the data processor shall act only on instructions from the data controller. The data processor must provide sufficient guarantees in respect of the technical security measures and organisational measure governing the processing to be carried out and must ensure compliance with such measures.

Partners ensure that no personal data will be shared among the partners unless it has been fully anonymized prior to the data sharing, or, on a need-to-know basis, the specific partners have entered into separate data processing agreement and have determined what operational measures should be taken prior to such personal data exchange or processing, all in accordance with the data protection legislation.

Data transfers are subject to specific safeguards when the recipient is located in a country outside of the EU/European Economic Area (EEA). Concerning data transfers to/from non-EU countries, partners have provided the necessary data protection adequacy confirmations. Thus, any transfer of personal data from the EU partners to non-EU partners will follow the relevant Chapter V of the GDPR.

5. Ethical Aspects

This section deals with ethical and legal compliance issues that can have an impact on data sharing. Good research ethics are a major topic for the Consortium of this project and aim to ensure that ethical requirements are met for all research undertaken in the project, including data management aspects, in compliance with H2020 ethical standards and all actions are taken with great care to prevent any situation where sensitive or confidential information could get misused.

5.1. MED Food TTHubs ethics and research integrity

Ethical requirements are defined on the basis of relevant principles, values, and norms of the domain and on various documents providing normative guidelines, recommendations, and requirements, as well as conceptual approaches.

MED Food TTHubs project is based on fundamental rights as enshrined in the Charter of Fundamental Rights of the European Union (EU Charter), and in relevant international human rights law. Members of the Consortium assure to comply with the ethical principles as set out in Article 34 of the Grant Agreement which specifies that the project will abide by the highest standards of research integrity, and accordingly will consider the fundamental principle of research integrity as set out in the European Code of Conduct for Research Integrity[1]. To this end, the project refrains from the research integrity violations described in this Code and complies with the relevant applicable international, EU, and national law. This implies compliance with the following fundamental principles:

- **reliability**: project ensures the quality of research reflected in the design, the methodology, the analysis, and the use of resources. This means that persons carrying out research tasks, design their research carefully and conduct it in a reliable fashion, taking its impact on society into account;
- **honesty:** project develops, undertakes, reviews, reports, and communicates research in a transparent, fair, and unbiased way. This means that persons carrying out research tasks present their research goals and intentions in an honest and transparent manner;
- **respect:** project activities are aligned with respect for natural persons, society, ecosystems, cultural heritage and the environment. This means that the project uses techniques and methodologies (including for data collection and management) that are appropriate for the field(s) concerned and exercise due care for human beings, animals, the environment or cultural objects;

[1] European Code of Conduct for Research Integrity of ALLEA (All European Academies) https://www.allea.org/wp-content/uploads/2017/05/ALLEA-European-Code-of-Conduct-for-Research-Integrity-2017.pdf .

- **accountability:** research tasks follow good research practices from idea to publication, for project's management and organisation, training, supervision and mentoring, and for its wider impacts and means.

In case project activities raise ethical issues, these will comply with the H2020 ethical standards and EC ethical requirements. According to article 34.2 of the Grant Agreement, before the beginning of an activity raising an ethical issue, each partner shall have obtained:

- any ethics committee opinion required under national law, and
- any notification or authorisation for activities raising ethical issues required under national and/or European law needed for implementing the action tasks in question.

The documents must be kept on file and submitted upon request by the coordinator to the PRIMA Foundation (see Article 52 of GA). If they are not in English, they must be submitted together with an English summary, which shows that the action tasks in question are covered and includes the conclusions of the committee or authority concerned (if available).

5.2. Meeting ethical requirements

The MED Food TTHubs does not involve any specific ethical issues beyond those normally associated with scientific work in general. Data protection requirements, security requirements, non-discriminatory use of technical tools, as well as responsibility and liability are considered.

Besides, the project does not include activities that:

- Aim at human cloning for reproductive purposes;
- Intend to modify the genetic heritage of human beings which could make such changes heritable (with the exception of research relating to cancer treatment of the gonads, which may be financed);
- Intend to create human embryos solely for the purpose of research or for the purpose of stem cell procurement, including by means of somatic cell nuclear transfer;
- Involve animals.

Throughout the project's entire lifecycle, data is collected/generated in order to be used within the MED Food TTHubs ecosystem to properly carry out the tasks planned. Data collection/generation is carried out in compliance with the above-mentioned fundamental principles and applicable legislation. Following these principles maintains the responsible and sustainable use of the data generated and processed in MED Food TTHubs.

It is highlighted that the project does not include the processing of sensitive personal data (e.g. health, sexual lifestyle, ethnicity, political opinion, religious or philosophical conviction), children's personal data, genetic information, and data obtained from tracking or observation of natural persons.

5.2.1. Ethical issues raised from personal data processing

Whenever personal data is processed, there are not only legal but also ethical implications to be considered. This is due to the fact that the processing of personal data may create significant risks to the fundamental rights and freedoms of natural persons.

In cases where data collection/processing includes personal data, the above principles further serve as a complement to the project's compliance with data protection laws and current regulations (specified in section 4). In order to be fully ethically compliant when dealing with personal data, the MED Food TTHubs project abides by all relevant applicable EU provisions, including the Charter of Fundamental Rights of the European Union, the European Convention on Human Rights, the European Commission's Ethics and Data Protection, the General Data Protection Regulation EU 2016/679 ("GDPR"), and national data protection laws. This legislation is adhered to during the development of the MED Food TTHubs tools and framework in order to ensure human dignity and respect for the values, rights, and interests of natural persons and fair distribution of the benefits and burden of research. Partners deploy all the efforts needed to ensure a high level of transparency in data treatment and compliance with national and European legislation. As mentioned, partners provide a signed declaration of compliance with applicable European and national data protection legislation, including EU 2016/679 General Data Protection Regulation (Appendix I).

Ethical issues raised from personal data processing during the project are addressed by complying with GDPR requirements and data safety provisions and implementing appropriate technical and organisational measures for data security. Such measures are, inter alia:

- anonymization and encryption of personal data (any personal information data is aggregated/anonymised before being made openly available),
- anonymity during surveys (where possible),
- informed consent of participants in the interviews, surveys, workshops, and pilots. This consent is obtained after providing information sheets and consent forms (the participation happens on a voluntary basis and there is the ability of consent withdrawal at any time),
- ongoing confidentiality, integrity, availability, and resilience of processing systems,
- 'Privacy by Design' rules implementation,
- mechanisms to avoid any intentional or unintentional use of information that can bring any harm to any participant, or being misused in other contexts,
- Implementation of principles cited in the GDPR, as:
    - Proactive not Reactive: Preventative, not Remedial;
    - Privacy as the Default setting;
    - Privacy Embedded into Design;
    - End-to-End Security: Full Lifecycle Protection;

- Visibility and Transparency: Keep it Open;
- Respect for User Privacy: Keep it User-Centric,

- the ability to restore the availability and access to personal data in a timely manner in the event of a physical or technical incident, etc.

In addition, access role distribution is applied. As mentioned before, the Freedcamp management platform is used as a repository for the project's data safekeeping. All data and deliverables of the project (both public and confidential) are uploaded and stored there. Project Coordinator has the responsibility and authority to grant/alter/remove role-based access rights to the repository and its documents. Personal data is strictly held confidential during the project and the partners may grant their personnel access only to data that is strictly necessary for implementing, managing, and monitoring the project's activities. Freedcamp, as a service, implements appropriate security mechanisms that ensure the safety of data storage and processing.

In any case, and according to Consortium and Grant Agreement, each partner is responsible for and able to demonstrate compliance with ethical standards. Consortium members signed a declaration of compliance with the ethical standards and guidelines of Horizon2020 that are rigorously applied, regardless of the country in which the activity is carried out (Appendix I).

5.2.2. Blockchain's ethical issues

The topic of ethical issues also requires special attention regarding the development and operation of MED Food TTHubs e-Platform. Within the platform, data will be managed using blockchain technology to provide transparency and trust. The MED Food TTHubs e-Platform acts as a shared data layer to enable multiple parties to track the status of a product as it moves across the custodial chain and share information on its provenance and handling in a secure and transparent way. From a data protection and ethics perspective, blockchain technology is a suitable tool to achieve GDPR's objectives and ethical requirements. Blockchain acts as a data governance tool that could support alternative forms of data management and distribution. Blockchain is designed to enable data-sharing without the need for a central trusted intermediary and offers transparency as to who has accessed data. The design of the e-Platform addresses privacy issues by implementing procedures and defining the process in order to limit and control information disclosure and being compliant with national and EU data protection legislation. By employing a blockchain based service, the Platform provides tools to ensure trust in data and full traceability, enhancing the level of security and trust in the data that flows directly to the blockchain, serving as a single point of truth, and preserving provenance. Thus, the Platform guarantees immutability and finality.

Regarding access to the e-platform and its components, the system is not open for anyone to join and see. During the development and evaluation of the e-platform, data is entered by the users (i.e. partners or pilot participants) in the platform for testing purposes. The unprocessed data is

not public. The consortium acts as the gatekeeper granting permission to someone to join the network. A data protection approach is adopted that ensures the authentication of users accessing the data and, furthermore, confidentiality, access control, and integrity of handled data according to the permissions granted by the data owner. Security and integrity of data will be tackled through a hybrid encryption scheme through the usage of symmetric encryption ensuring the confidentiality of handled data and also ensuring the protection of personal data, whereas the application of asymmetric encryption on top of such symmetric scheme enables better management and distribution of keys.

6. Data security

MED Food TTHubs will **securely handle any collected/generated data** throughout its entire lifecycle as it is essential to safeguard this data against accidental loss and/or unauthorised manipulation. Particularly, in case of personal data collection/generation it is crucial that this **data can only be accessible by** those authorised to do so. With that in mind, the project's back-up and data recovery strategy aims at ensuring that no data loss will occur during the course and after the completion of MED Food TTHubs, either from human error or hardware failure, as well as inhibit any unauthorised access.

All project partners are responsible for processing data within their private servers and will ensure that this **data is protected**, and any **necessary data security controls have been implemented**, to minimise the risk of information leak and destruction. This case refers to the data that will be closed and therefore will not be shared and/or re-used within the framework of the project.

Identification and authentication access controls play an important role in the context of the project, as they help partners to protect the data produced/used during MED Food TTHubs and especially personal data. To this end, each project partner is responsible for and committed to ensuring the application of appropriate access controls to the data they are processing within their private servers of their organisation. Moreover, in order to safeguard the privacy of the users of the project's Web Portal and MED Food TTHubs platform, dedicated **privacy policies** will define the way in which these online spaces collect, process and use personal data, the security procedures followed, the users' rights as well as the cookies policy employed.

6.1. IPR and copyrights

The IPR strategy of the project is an important part of the project exploitation plan. The IPR strategy and the exploitation management is handled in the Consortium Agreement, as well as in the Grant Agreement. The MED Food TTHubs IPR Plan & IPR Management (D1.4) will detail what

data the project will generate, whether and how it will be exploited or made accessible for verification and re-use, and how it will be curated and preserved.

MED Food TTHubs project covers some technologies that aim to develop marketable solutions. Each of the consortium members is qualified for Intellectual Property Rights (IPR) on their technologies and data, on which their economic sustainability could be at stake. Thus, the MED Food TTHubs consortium will protect that data and get approval of concerned partners before every data publication.

The Data Management Portal, Freedcamp, will be equipped with authentication mechanisms to handle the identification of the persons/organizations that download the data, as well as the purpose and the use of the downloaded dataset.

6.2. Data Management Portal

The Data Management Portal (DMPO), a web-based portal namely Freedcamp, is being used within the MED Food TTHubs project for the purposes of the management of the various datasets that will be produced by the project, as well as, for supporting the exploitation perspectives for each of those datasets. Freedcamp Portal is flexible in terms of the parts of datasets that are made publicly available. Special attention will be given to ensure that the data made publicly available violate neither IPR issues related to the project partners, nor the regulations and good practices around personal data protection.

Access to The Freedcamp Portal is given through a web-based platform, which enables its users to easily access and effectively manage the various datasets created throughout the development of the project. Regarding the user authentication, as well as the respective permissions and access rights, the following user categories are foreseen:

- **Admin**: the Admin has access to all of the datasets and the functionalities offered by the DMP and is able to determine and adjust the editing/access rights of the registered members and users (OA area). Finally, the Admin is able to access and extract the analytics, concerning the visitors of the portal.
- **Member**: when someone successfully registers to the portal and is given access permission by the Admin, she/he is then considered as a “registered Member”. All the registered members will have access to and be able to manage most of the collected datasets. Knowledge sharing and public documents, apart from the admin and the registered members, as Open Access (OA) area will be available for users who will not need to register and they will have access to some specific datasets, as well as to project outcomes.

7. Further support developing DMP

The DMP is considered as a constant "work-in-process" and will be continuously updated throughout the duration of the project. Therefore, some issues will need to be addressed at later stages as work progresses. An indicative list of issues that might have arisen is given in Table 3.

Table 3: Issues for future resolve regarding the DMP

Category	Potential Issues
Data interoperability	• What is the strategy for ensuring that the data produced in the project are interoperable? • How can make sure that data exchange and reuse between researchers, institutions, organisations, countries, etc. (i.e. adhering to standards for formats, compliant with available (mostly open) software applications, and in particular facilitating re-combinations with different datasets from different origins) is allowed? • What data and metadata vocabularies, standards or methodologies will be followed for data interoperability? • Will standard vocabularies for all data types will be used, to allow inter-disciplinary interoperability?
Data re-use (through clarifying licences)	• How long will the data be available for reuse? • How will the data be licensed so that they can be reusable? • How and when will the data be available for reuse? • Are the data produced/used by third parties and will this affect their availability for reuse? • What are the data quality assurances?
Allocation of resources	• What is the long-term strategy for preservation of data, taking into account cost for storage and value of data?
Data security	• What measures are being taken for data security (sensitive data, data recovery, etc.)?
Other issues	• Are some national/sectorial/departmental strategies for data management used? • Are the best practices and feedback mechanisms for the data management platform (Freedcamp) followed properly?

Considering the project's latest developments and available results, the issues presented in Table 3 have not raised significant concerns. On the contrary, the main issues that came up during the project and had to be addressed were data sharing, privacy and ethical issues. Therefore, the present deliverable updated according to the project progress and the data resulting from its activities and pilots' development. The objective of this update focused on defining the sharing conditions of datasets generated all along the project and the analysis of the personal data protection and ethical aspects of the project (sections 4 and 5).

Conclusions

The MED Food TTHubs DMP aims at safeguarding the sound management of the data produced/used during the project's activities across their entire lifecycle, while also making them compatible with the FAIR scheme. It describes all the underlying processes of the MED Food TTHubs data management, collection and generation, in accordance with the GDPR guidelines. In addition, this document sheds light on (i) the data foreseen to be collected/generated under the project activities, (ii) the specific objectives under which each dataset will be collected/generated, (iii) the allocation of resources and data management responsibilities and (iv) the data security.

The MED Food TTHubs DMP is identified as a starting point for the discussion with the partners in the beginning and later on with a broader community, about the MED Food TTHubs data management strategy and reflects the procedures planned by the work packages at the beginning of the project. An extended discussion has been conducted within the consortium partners, in order to get a general view on the kind of data they were expecting to produce and collect during the project. This DMP is the final updated version of the deliverable, considering its latest developments and available results.

Appendix I: Template – Declaration of compliance with EU and national legislation

Name of organisation:

_____

Contact details of organisation:

_____

This organisation is required to appoint a Data Protection Officer under the GDPR requirements:

□ Yes (DPO's name and email: _____)

□ No

I, _____, representative for _____, have been provided with information and have a full understanding of the nature and purpose of the planned activities by this organisation for the MED Food TTHubs project, which may or will involve the processing of personal data.

I confirm that all personal data collection and processing will be carried out according to applicable European and national data protection legislation, including EU 2016/679 General Data Protection Regulation ("GDPR"). The GDPR and the national laws implementing the Regulation shall be adhered to during the development of the MED Food TTHubs tools and framework and while collecting, processing, managing, using, and deleting research data throughout the project. I confirm that this organisation and the individuals representing it within the MED Food TTHubs project, are aware of the relevant data protection requirements and act in compliance with them. In case personal data are transferred from/to the EU to/from a non-EU country or international organisation, I confirm that such transfers will be in accordance with Chapter V of the General Data Protection Regulation 2016/679.

I also confirm that project activities will be rigorously conducted in light of the ethical standards and guidelines of Horizon2020 and the highest standards of research integrity.

Date: _____

Signed: _____

Name: _____

Appendix II: Template - Informed consent

This informed consent is for individuals participating in the Med Food TT Hubs project. This informed consent has two parts:

- Information sheet: to share information about the study with you.
- Consent form: to sign if you agree to participate.

You will be given a completed copy of the informed consent form.

Information sheet

1. Context

MED Food TTHubs is an EU Research&Innovation co-funded project that seeks to support the implementation of full-path traceability practices through the whole distribution channel of agro-food from seed to shelf in order to achieve safer and more sustainable Mediterranean food products for people all around the world.

The project will establish 7 Trace & Trust Hubs in the participating countries (Greece, Italy, Egypt, Jordan, Portugal, Spain, Tunisia) which act as one-stop-shops for traceability and authenticity for Mediterranean food at local level. For the proper and efficient realisation of the aims of the 7 Hubs, an electronic web-based platform will support the accurate implementation of traceability and authenticity procedures.

TTHubs e-platform will manage information concerning different locations of the supply chain (fields, farms, packing houses, warehouses), agro-food products, actors and events. The e Platform, based on the blockchain technology, which ensures the transparency and integrity of the recorded data along the supply chain, includes 10 Modules (Farm App Module, IoT Module, B2B Module, Quality Module, Isotopic Profile Module, DNA Markers Module, Nutritional Profile Module, External Tracing Module Internal Tracing Module and Consumer Module)

2. Aim of the pilot

The final goal of the piloting process is to test and evaluate the TTHubs electronic web-based platform and its components/modules, collecting feedbacks from the end user's perspective, useful to optimise the tool and make it useful for a wide application in the agrifood sector.

3. Participation conditions

Participation to pilot is on a voluntary basis.

The project will provide to pilot player:

- free access to the Beta version of the TTHubs e-platform;
- free training sessions and training materials (tutorials, videos).

The Beta Test Material provided are the sole property of the MED Food TTHubs project and participant shall have no such intellectual property rights in the Beta Test Material.

Pilot player will commit in:

- communicating the name(s) of the internal reference staff persons in charge of this Test and who will be responsible for communication with project's teams on a regular basis;
- assure collaboration during the pilot duration;
- promptly respond to any and all reasonable inquiries, surveys and other test documents submitted to him by the project.

Pilot can be suspended or terminated in any moment by (PROJECT PARTNER NAME), as a consequence of events happening at project level, decisions of the European Commission or decisions taken by the project governing bodies,

Pilot player can withdraw from participation in writing form, justifying this will to the country leader.

4. Duration

The pilot will require an effort based on the willingness of the pilot players in testing one or more Modules. A maximum effort of 8 weeks is estimated in the period 01 September 2022 - 31 March 2023.

During this time, you will participate in different types of assessments such as interviews, surveys or questionnaires through different means (face-to-face, telephone, online). This activity will not involve a commitment of more than 1 or 2 times a month for about 30 minutes.

5. Personal Data protection and data management

Identity of the people participating in the pilot will be maintained confidential, known only by the researchers directly involved in the local pilot and by the European Commission. The same will be applied to the organisation's legal name (unless the company itself is asking for visibility).

Personal data will be processed in accordance with the provisions of the General Data Protection Regulation (GDPR). The personal data that shall be entered for users and contact persons in the e-platform include only the following: Name and Surname, email and telephone (optionally). Pilot player has the right of access, rectification, erasure, restriction of processing, portability, opposition, and the right not to be subject to individualised decisions. It can exercise all these rights by contacting Green Projects S.A., which is the Partner responsible for data processing and data handling: xxxx@green-projects.gr

Data typed into the e-platform in relation to organisation's processes and procedures are stored in the Cloud and protected by the Cloud service provider responsibility on data security. All information provided by the users in the e-Platfrom, apart from the passwords of the users, are visible to the administrators of the e-Platform. All administrators of e-Platform are employees of Green Projects SA and they are all bind by privacy clause in their employment agreement.

The provided data may be available through the e-Platform to the public, to registered users or/and on peer-to-peer basis. More specifically the following data access policy is followed:

- Publicly Available:

    - Organizations' data
    - Places' data
    - Products' descriptions
- Registered users:
    - Products' Certifications
    - Isotopic, DNA and Nutritional Profiles
    - Events of the supply chain
    - Sensors' data
    - Availability of products (optionally)
    - Products' prices (optionally)
    - Contacts data
- Peer-to-Peer (given a mutual consensus):
    - Products' quality-checks
    - Availability of products (optionally)
    - Products' prices (optionally)

Processed data will be analysed in aggregated form, without referring to the single player.

Contacts

Country Leader – xxxx

TTHubs e-platform administrator: xxxx@green-projects.gr

Consent form

I have received information about the MED Food TTHubs project and the purpose of my participation to the piloting process. I have been given the opportunity to ask questions regarding the role expected by me, and I know to whom I should turn with further questions.

I willingly participate in the testing of the TTHubs proposed schemes (e-platform and traceability and anthentication protocols). I am committed to test for free the Beta version of the TTHubs Med Food e-platform during the period 01 September 2022 to 31 March 2023 and to respond to any and all reasonable inquiries, surveys and other test documents submitted by the project for assessment.

Any change or extension of the test period will be discussed among the Parties and applied only on mutual agreement.

I am aware of the option to withdraw from participation in this activity at any time. In case of withdrawal, I will decide what provided data can be processed and what needs to be excluded from analysis and report. Nevertheless, aware of the mutual collaboration commitment and time spent by both parties, withdrawal should be justified through objective elements.

I am aware that both Parties are committed in maintaining confidential information and data exchanged.

I give my consent to MED Food TTHubs to document, analyse and store the data and information collected during pilots running, and that results from such activity can be published in aggregated form in a way that data cannot be linked to individual organisation.

In addition:

□ I am willing to provide a sample of my product for DNA Markers Analysis

□ I am willing to provide data* for an economic and environmental assessment report without firm disclosure

Personal data

Name, Surname: …….

Position: …….

Organisation name: …….

At which stage of the supply chain is your organisation:

☐ Producers
☐ Processors
☐ Retailers
☐ Wholesalers
☐ Consumers

Address: ……

Country:…….. Region: ……

e-mail: …….

Phone: ……..

Detail your food sector (if applicable): ……

NOTE: The administrator of the e-platform will only give access to information which is not in conflict to any Intellectual Property Rights. Personal data will be treated according to GDPR law.

City, Country, and Date Name and signature of participant

…….. ……

***Type of data:**

Economic Data: Production Cost per unit, Selling Price per unit, Market Share, Collaborating Markets etc.

Environmental Data: Product Losses, Electricity Consumption, Packaging Materials & Weight, Facilities, Water Use etc.