EPOS SP – Grant Agreement n. 871121

D1.3 – Data Management Plan

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1	15/07/2020	Initial version (EPOS ERIC Management Office)
2	24/07/2020	Final version after EB revision

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Executive Summary

The main goal of the EPOS SP project is to perform activities aimed at ensuring the long-term sustainability of the EPOS Research Infrastructure (RI). The generation and/or collection of research data have been not considered and are not included in the EPOS SP concept design and methodology because the project is not research-oriented. Still, it is envisaged to collect legal, financial and technical data in order to tackle sustainability challenges. These data will be analysed and will allow us elaborating the EPOS Sustainability Plan for the EPOS Delivery Framework to be endorsed and adopted by EPOS ERIC General Assembly.

A Data Management Plan (DMP) is a key element of good data management. This deliverable presents an overview of data that will be collected and stored during the EPOS SP project. The document describes the data types as well as the formats and the relation with the project objectives. It highlights the purpose of the data collection, and it provides information on their utility. When applicable to the collected data, it will be explained how the data will be made openly available and/or archived. Main aspects related to ethical issues are also introduced.

This deliverable follows the Data Management Plan (DMP) template provided by the European Commission. Its content builds upon the input from the partners responsible for each work package (Executive Board). For this purpose, a survey, outlining the DMP's objectives and stating the required information in a structured manner, has been edited by the project management (WP1) and disseminated to the work package Leaders on June the 19th. The compiled answers have been integrated into this report.

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1. Introduction

EPOS Sustainability Phase (SP) will allow the EPOS Research Infrastructure to advance well beyond its current status and the general state of the art of national research infrastructures. It will ensure further progress beyond the EPOS Implementation Phase (EPOS IP project had received funding from European Union's Horizon 2020 Research and Innovation Programme under G.A. 676564) in terms of long-term sustainability of the pan-European Research Infrastructure and innovation in the use of multidisciplinary FAIR data from solid Earth science as a driver for scientific excellence and exploitation for economic and societal objectives. The adoption of shared data policies and access rules among scientists from so many different research domains in solid Earth science is a pre-requisite to establish the practice of open science. The engagement of 138 research organizations from 25 European countries and their involvement in harmonizing these policies and rules to endorse data sharing and transnational access to facilities in solid Earth science is a unique opportunity to consolidate open science and exploit the benefit of open and FAIR data principles. EPOS IP has created the conditions to foster this consolidation and exploitation of sharing solid Earth science data and within the EPOS IP project, the EPOS Data Management Plan (DMP)[1] have been elaborated. The EPOS DMP takes into account the distributed nature of EPOS RI. The EPOS architecture encompasses RIs at different levels: regional, national, trans-national and pan-European. The goal in EPOS was to harmonize these into a single framework and make data accessible through a unique European platform following the FAIR principles. The national RIs provide a wide spectrum of scientific data and advanced services to the domain specific communities. On top of this, European level Thematic Core Services (TCS) were built. Data, Data products, Software and Services (DDSS) from TCS are now integrated into the pan-European level portal (Integrated Core Services - ICS). As such the EPOS DMP is built upon the same architecture adopting open access and FAIR principles. It addresses the different stages of a data life cycle, including the scientific data collected by the domain specific communities (TCS) and the integrated distribution of their DDSS by the EPOS ICS. Building on that, EPOS SP will further consolidate the EPOS contributions to open science taking into account different aspects, more related to sustainability patterns.

EPOS SP, guided by EPOS ERIC, will tackle this challenge as a direct contribution to the sustainability of the EPOS Delivery Framework.
The data that will be collected during the project are used for:

- mapping the financial flow and the long-term engagement of in-kind contribution of national nodes and organizations;
- improving the completeness and the findability of the datasets available by the delivery service;
- improving the user value by providing services more consistent with the expectations of the researchers;
- establishing cooperation with the private sector;
- strengthening the societal value of EPOS data and service provision;
- ensuring the sustainability of data provision and preservation.

The collection of some of them is mandatory for the exhaustive implementation of the planned objectives. In some others case, they might consist of phenomenological data becoming available due to opportunistic conditions during activities that are not directly referring to data collection. In this case, the compliance with the ingestion requirements defined by EPOS will be verified and, if confirmed, new dataset or processed outputs will be created, improving the project objective beyond the expectations.

[1] EPOS IP Project - Deliverables 6.6 and 6.7, First and Seconf delivery of Data Management Plan, respectively.

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2. EPOS SP Data Summary

The Data Summary provides an overview of the purpose and the nature of data collection and generation and its relation to the objective of the EPOS SP project.

Table 1 summarizes the different data planned to be collected within the scope of the EPOS SP project. Information on data type, the source of the data, the relation with EPOS SP objectives and the format, in which the data will be stored is described.

Table 1: Overview of data collection in EPOS SP project

#	Data Type	Source	EPOS SP Objectives (addressed)	Format
1	Financial data from EPOS data and service providers	Interviews with Thematic Core Services (TCS) representatives.	Strengthening financial viability of EPOS ERIC.	.xls; .docx
2	Sensors and modelling data	Pre-existing datasets not yet available within the EPOS Delivery Framework, concerning physical phenomena of pertinence of existing or constituting TCS.	Engaging new thematic and regional communities for service provision in the EPOS Delivery Framework. Engaging new National Space Agencies.	product specific scientific data formats, following established community standards where applicable
3	Data related to industrial interest in EPOS services	Interviews / questionnaires with stakeholders from the private sector.	Establishing cooperation with the private sector.	.xls; .docx
4	Data related to the assessment of the societal impact and value of the EPOS services (internal and external perspective)	Interviews / questionnaires with EPOS (service) users and stakeholders.	Identifying the: • ethical implications of the EPOS service provision; • (perceived) value of EPOS for hazard and risk mitigation and preparedness.	.xls; .docx
5	Data related to TCS functioning and service provision	Interviews/questionnaires to TCS and data and service providers.	Ensuring sustainability of data provision and preservation.	.xls; .docx

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Table 2 outlines the description and purpose of the data in relation to the objectives of the project. It also shows the data utility to clarify to whom the data might be useful.

Table 2: Data description, purpose and utility

#	Data Type	Description and Purpose	Utility
1	Financial data from EPOS data and service providers	**Description:** data of recordings and transcriptions and survey responses collected during interviews with TCS representatives. Interviews will be conducted by TELCO means or in written form. **Purpose:** to collect financial data from data and service providers.	The information provided in the data are crucial for strengthening the EPOS financial sustainability.
2	Sensors and modelling data	**Description:** mainly phenomenological data from sensor measurement or imagery, reproducing the phenomenon evolution by time series. **Purpose:** to improve User Value by completing existing datasets; to provide services more consistent with the expectations of the researchers.	EPOS Delivery Framework will benefit from this data for improving the services requested and expected by the scientific communities.
3	Data related to industrial interest in EPOS services	**Description:** data collected and recorded during interviews and by mean of questionnaires with stakeholders from the private sector. Interviews will be conducted by TELCO means, in person or in written form. **Purpose:** to define EPOS-industry interactions and develop a suitable legal framework.	The information provided in the data are crucial for establishing cooperation with the private sector.
4	Data related to the assessment of the societal impact and value of the EPOS services (internal and external perspective).	**Description:** the data consists of recordings and transcriptions (for telco-based interviews) and survey responses (tabulated text). **Purpose:** to assess the current and future (target) relevance and use of EPOS products and services from a provider and user perspective for the 'societal impact' viewpoint, particularly in the context of ethical implications and mitigating hazard and risk (content and technical issues).	The data / results will inform EPOS governance bodies regarding strategic matters, EPOS Service providers regarding service uptake and potential further developments, and other (potential) stakeholders regarding the value of engaging with EPOS.
5	Data related to TCS functioning and service provision.	**Description:** data of recordings and transcriptions and survey responses collected during interviews with TCS representatives. Interviews will be conducted using TELCO means or they can also be conducted in written form. **Purpose:** to collect financial data from data and service providers.	The information provided in the data are crucial for elaborating the landscape analysis.

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3. FAIR Data

Making data openly accessible

The Open Science agenda contains the ambition to make FAIR (Findable, Accessible, Interoperable and Re-usable) data sharing the default for scientific research by 2020. Data FAIRness is considered a necessary target for research infrastructures in different scientific domains both in Europe and at the global level. To this goal, FAIR guiding principles for research data have been recently proposed to the scientific communities as the new horizon for sharing data. The FAIR principles create the conditions to foster data sharing and improve data stewardship, provided that several normative, organizational and ethical issues are addressed.

EPOS SP will guide the solid Earth science community to contribute to the establishment and to foster the adoption of the normative, organizational and ethical conditions to apply FAIR principles. EPOS SP can contribute to filling the currently existing gap between FAIR principles and viable practice to FAIRness. Furthermore, the original e-science concepts for interoperability and accessibility already adopted by EPOS will represent the optimal initial conditions to move towards the implementation of FAIR data in solid Earth science, coherently with consolidated and shared data management plans.

The EPOS pan-European infrastructure represents the proper collaborative environment to experience the difficulties and test the solutions to make solid Earth science data FAIR with the goal of fostering open science. EPOS SP will engender data interoperability within Earth Sciences at the global scale and provide services for a broad community of users beyond scientists.

The entire EPOS data portfolio (Data, Data Products, Software and Services, DDSS) respects the EPOS Data Policy (https://www.eposeric/documents), which will be as well applied to the EPOS SP project data. The EPOS Data Policy key principles are:

- to disseminate data and knowledge through Open Access;
- to make DDSS available in a timely manner, without undue delay and preferably free of charge taking in due account the need to differentiate between virtual and remote access and physical access;
- to follow the OECD principles for research data from public funding;
- to utilise a widely accepted community licensing scheme, i.e. Creative Commons.

The EPOS Data Policy acknowledges the ongoing work of the European Commission to foster the FAIR (Findable, Accessible, Interoperable, Reusable) principles for data access.

Table 3 gives an overview of data accessibility in the framework of the EPOS SP project. It highlights whether or not the data collected during the project can be made openly available. For those data (collected through interviews and surveys) that cannot be made openly available because of privacy and security issues, alternative solutions to the “fully open policy” are proposed. In particular, in the case of data type #4 (partially openly available), the data that can be made available will be published and archived as electronic documents (.xlsx or .docx) with a DOI that allows access to data and metadata preferably on a relevant EPOS data infrastructure (if available) or on the research collection of the institution in charge of collecting them.

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Table 3: Data accessbility

#	Data Type	Data Openly Available	Justification	Alternative Solution
1	Financial data from EPOS data and service providers	NO	Data from interviews will not be published as primary data due to privacy and security issues.	Analysis and interpretation of the data will be accessible in public reports, i.e. project deliverable D2.4. Anonymization is not considered a suitable alternative.
2	Sensors and modelling data	YES	Scientific data compliant with the data policy implemented in EPOS infrastructure.	
3	Data related to industrial interest in EPOS services	NO	Data will not be published as primary data due to privacy and security issues.	Analysis and interpretation of the data will be accessible in public reports, i.e. project deliverable D5.9. Anonymization is not considered a suitable alternative.
4	Data related to the assessment of the societal impact and value of the EPOS services (internal and external perspective).	Partially	Data will not be published as primary data due to privacy and security concerns. The data may be of interest / relevance for further studies or comparisons, and/or as a baseline for monitoring future changes in perception / uptake.	Where possible and feasible (for privacy and data protection issues) the data will be made openly available as part of public reports, i.e. project deliverables D6.1 and D6.3. For data that cannot be published, also anonymization is not considered a suitable alternative.
5	Data related to TCS functioning and service provision.	NO	Data will not be published as primary data due to privacy and security issues.	Analysis and interpretation of the data will be accessible in public reports, i.e. project deliverables D8.1 and D8.2. Anonymization is not considered a suitable alternative.

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4. Ethical Aspects

Personal data which will be collected within the EPOS SP project will only be stored, analysed and used anonymously. The individuals will be informed comprehensively about the intended use of the information collected from them and have to agree to the data collection for the project purposes with their active approval in the form of written consent.

The identity of any individual interviewed or other wisely engaged in the project (e.g. by email correspondence) will be protected by this anonymization of the data. The anonymization process guarantees that no particular individual can be identified anymore.

The Beneficiaries in charge of delivering interviews and questionnaires, will guarantee that this process, including the information for the individuals about data protection issues, fully complies with national and EU laws. Any data collection activity will have to gain the approval of the Ethics board of the responsible Beneficiary (where applicable).

The ethics requirements that the project must comply with will be included in the following deliverables due at M17:

- D9.1: POPD - Requirement No. 1
- D9.2: M - Requirement No. 2

5. Next Steps

The D1.3 Data Management Plan is intended to be a living document. It will be updated at M18 or earlier if significant changes will arise on the following issues:

- new data;
- changes in consortium policies;
- changes in the consortium composition and external factors.

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