

EPOS SP – Grant Agreement n. 871121

D1.4 – First report on KPIs and risks monitoring to internal boards

Document Information Summary

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Executive Summary

D.1.4 "First report on KPIs and risks monitoring to internal boards" (M12) has been drafted by the EPOS ERIC Executive Coordination Office (ECO) and approved by the Executive Board (EB) in the framework of the WP1, Task 1.3 "Risk Management and project impact assessment". Task 1.3 focuses on ensuring an adequate quality control mechanism to manage the project impact and risks.

In details, the EPOS SP Key Performance Indicators (KPIs) have been defined by the Work Package Leaders for each Work Package at the beginning of the project (M2) and approved by the EB during the 2nd EB meeting on March 23rd (Milestone 20) together with the first version of the Risk Register (D1.2 "Risk Register" submitted on April 2020).

On July 7th 2020, during the 4th meeting, the EB agreed on updating the Risk Register, including an unforeseen risk related to the COVID-19 pandemic focusing on the delay in achieving milestones or submitting deliverables.

During the project lifetime, periodic assessments of the state of the play of the project key performance indicators (KPIs) and risks will be performed within each WPs and at Executive Board (EB) level. Corrective actions will be defined after the end of the first and second year of the project (M12, M24) if the performance, quality and effectiveness of the activities executed are not achieved. Risks' mitigation and contingency measures will be implemented if needed.

This Deliverable describes the monitoring status of the KPIs and risks associated with the EPOS SP Workplan at M9. It will support the EPOS SP Boards (namely, the Executive Board, Project Council, and Advisory Board), to guarantee the effective management of KPIs and risks and propose timely corrective actions (when relevant) for the prosecution of the project.

A detailed KPIs classification and evaluation is provided within the current document, looking forward to D1.5 "Final report on KPIs and risks monitoring to internal boards" at M30.

Introduction

The overall objective of the EPOS SP project (February 2020 – January 2023) is to perform activities aimed at ensuring the long-term sustainability of the EPOS Research Infrastructure (RI). Long-term sustainability is the most challenging target for research infrastructure. Indeed, it should provide a good structure and long-term resources for operation; this, in turn, demands the building and sustaining a complex synergy within different actions performed by very diverse actors. In particular, these actions have to be dedicated to:

1. Secure governance and financial sustainability of the research infrastructure operation.
2. Secure technical sustainability and develop innovation to exploit data and service provision fully.
3. Establish and maintain excellence by preserving and reinforcing the trust and awareness of users.
4. Exploit economic and societal benefits to keep stakeholders engaged.

In this framework, the EPOS SP project's overall concept reflects the assumption that sustainability requires a broader view, including governance, financial viability, technical availability and capability, cooperation with other research infrastructures and industry, and interactions with all potential user categories. The EPOS SP work packages structure (Figure 1) is organized to accomplish the overall objective and specific objectives of the EPOS SP project by focusing on strategic actions to be addressed to specific stakeholders.

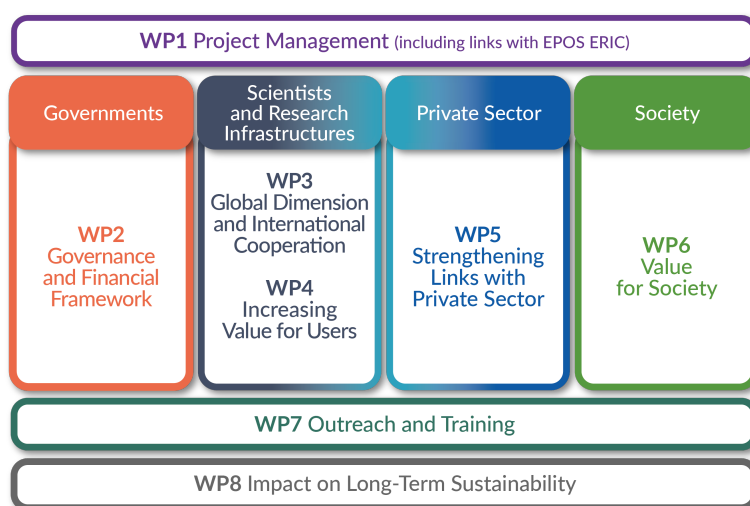


Figure 1. EPOS SP work packages structure.

To guarantee the achievement of the proposed objectives as well as to ensure high quality results of the project, it is essential to monitor the risks, and the performance, quality and effectiveness of the activities executed on yearly bases in order to define timely corrective actions for ensuring a proper and successful prosecution of the project.

Therefore, since the beginning of the project (2nd, 4th, 5th and 6th EB meetings) high relevance has been dedicated to the risk identification and management at WP level. The risk monitoring took this central role in particular because of the COVID-19 pandemic that could impact negatively on some project activities and results. KPIs have been monitored at M9 during the project interim assessment.

In the following chapters it will be described the results of the monitoring of KPIs and risks associated to the project's work plan at M9.

1. Impact Assessment

EPOS SP project is committed to preserve and build on the achievements of the EPOS Implementation Phase while developing a sustainability plan to be endorsed and adopted by EPOS ERIC for the entire Delivery Framework. Therefore, actions and activities have been planned to ensure the project will have an impact on value for users; scientific value; community building; economic value; societal value.

Each of these impacts is ensured following specific approaches in the EPOS SP work programme:

- **Value for Users:** enhancing the sustainability of the data and service provision that includes reinforcing and preserving users' trust and awareness.
- **Scientific Value:** sustaining the use of the EPOS pan-European infrastructure to ensure progress and innovation in science responding to society and industry needs.
- **Community Building:** fostering participation in the EPOS integration plan and awareness of data sharing and enhancing the role of the EPOS Community in European and international organizations/initiatives and multilateral fora.
- **Economic Value:** fostering the integration of research and innovation in solid Earth science by establishing a sustainable framework for cooperating with the private sector, including industry and SMEs.
- **Societal Value:** increasing the added value to society derived from sharing data, products and information concerning both EPOS hazard and risk and EPOS readiness for Open Science, clarifying the ethical dimension of the EPOS service provision to society.

The project's impact in the framework of the entire EPOS Delivery Framework is then assessed through Key Performance Indicators (KPIs) and qualitative impact indicators as reported in the Description of Action (DoA). Moreover, specific KPIs focused on the objectives of each work package used as tools to:

- measure how effectively the project is achieving key objectives listed in the DoA;
- early warning about related risks (risks as mapped in the Risks Register);
- contribute to the project impact assessment.

The list of those specific KPIs elaborated by each WP Leader for the concerned WP has been shared within the EB and approved by the Board. KPIs' definition has been focused and tailor-made to measure the performance, effectiveness, and relevance of the activities executed in the different Work Packages (WPs), and they were tested against the RACER criteria¹ listed below:

- **Relevant** – i.e. closely linked to the objectives to be achieved
- **Accepted** – e.g. by staff and stakeholders
- **Credible** for non-experts, unambiguous and easy to interpret
- **Easy to monitor** – e.g. data collection should be possible at low cost
- **Robust** – e.g. against manipulation

¹ [1] <http://ec.europa.eu/competition/publications/reports/kd0117397enn.pdf>

1.1 Monitoring of Key Performance Indicators

During the 2nd EB meeting on March 23rd, the Management, through the ECO, proposed a first set of KPIs that needed to be well-tuned for each Work Package and approved by the Board (Milestone 20, M2). For this reason, each WP Leader went through the proposed KPIs, analysing them with their team, and updated the list provided by the ECO. In particular, (i) the KPI description, (ii) purpose, and (iii) measurement tools were updated. Within mid-April, the Management included all the WP KPIs in a master table and circulated it within the EB Board for approval. It has been incorporated in the 2nd EB meeting minutes as the approved KPIs list (Milestone 20).

Each WP Leader is responsible for updating the proposed KPIs, objectives, purpose, and measurement tools periodically. Indeed, a systematic monitoring process is planned to assess and update KPIs meeting the project's goals, specifically, on the occasion of the interim report at M9 and M27. At the end of the first and second year of the project (M12, M24), the WP leaders are then called to propose corrective actions to the EB for their evaluation and application, if the performance, quality and effectiveness of the activities executed are not achieved. Only those corrective actions considered suitable for ensuring: i) the expected impacts of the project and ii) the proper management of the risks, will be regarded as valid and applicable. Therefore, the EB will consider the global impact of these measures and assess the possible risks, together with the relevant corrective measures.

The KPIs classification and assessment at M9 are provided within the current document (Annex I). In particular, the impact assessment activity undertaken at M9 at WP level, reports the following main concepts, considering the WP aims:

WP1 Project Management aims to ensure the project's success through adequate management and quality control mechanisms and efficient and proactive interaction with the European Commission. At M9, W1 reached the objectives for the period, with no delay.

WP2 Governance and Financial Framework aim to undertake activities to strengthen financial sustainability in a context coherent with the EPOS ERIC governance; at M9, WP2 performance is in line with the period's objectives.

WP3 Global Dimension, European and International Cooperation aims to expand the EPOS global dimension and foster international cooperation with other research infrastructures, Earth science and e-science initiatives and other regions worldwide. At M9, WP3 reported a delay in its planned activities mainly due to COVID-19 Pandemic. WP3 activities are mostly events or cooperation activities. WP3 informed it is premature to measure the KPIs at this stage.

WP4 Increasing Value for Users aims to create awareness and trust in the users of the EPOS provision and engage new users and scientific communities in EPOS. WP4 assessment confirms KPIs are on track with the planned objectives.

WP5 Strengthening links with Private Sector aims to foster sustainable and ethically coherent cooperation with industry and SMEs; at M9, WP5 reported a delay in its activities mainly due to COVID-19 Pandemic. WP5 activities are mostly interaction activities with the private sector. WP5 informed it is premature to measure the KPIs at this stage.

WP6 Value for Society deals with society's societal benefits of the EPOS Delivery Framework in an ethically coherent framework. Due to the nature of its activities, WP6 KPIs are qualitative indicators. M9 assessment proved they are in line with the expectations.

WP7 Outreach and Training aims to foster dissemination, outreach and training on the use of the EPOS data and service provision for different stakeholder categories and target audiences. Several virtual events have been organised, keeping WP performance high. WP7 identified corrective actions consisting of managing the meetings and training events virtually. It allowed the WP to maintain the scheduled work plan.

WP8 Impact on Long-term Sustainability has the crucial role of integrating all the results achieved in the stakeholder-oriented activities (WP2-6) to maximise the impact on the EPOS Delivery Framework's long-term sustainability guided by EPOS ERIC. WP8 objectives will be reached on a long-term basis, so it is premature to measure the KPIs at this stage.

In conclusion, some delay in the project performance is due to COVID-19. Considering this aspect, efficient risk management at WP level is planned and managed through the project risk register (Annex II).

The "Final Report on KPIs and risks monitoring to internal boards" is scheduled at M30.

2. Risks Management

The purpose of risk management is to identify potential problems before they occur so that risk-handling activities may be planned and invoked as needed across the life of the project to mitigate adverse impacts on achieving objectives. Risk management is a continuous, forward-looking process that is an important part of the management process. EPOS SP Risk management addresses issues that could endanger the achievement of critical objectives. A continuous risk management approach is applied to effectively anticipate and mitigate the risks that have a critical impact on the project.

The continuous EPOS SP risk management process is based on the early identification of and the fast reaction to events that can negatively affect the project's outcome. The identified risks are then analysed and graded, based on the impact and probability of occurrence.

Moreover, roles and responsibilities for the risk identification and the project risk assessment strategy have been addressed in detail in D1.2 "Risk Register". Such process aims to identify, analyse, and prioritise risks inherent in the project and then determine the appropriate actions to eliminate or mitigate their effects to ensure that the project progresses smoothly towards the achievement of the planned results following its roadmap to reach the envisaged long-term sustainability.

The EPOS SP risk management plan has been defined to ensure that the project progresses smoothly towards achieving the planned results following its roadmap to reach the envisaged long-term sustainability. This process aims to identify, analyse, and prioritise risks inherent in the project and then determine the appropriate actions to eliminate or mitigate their effects.

The same approach performed during the EPOS Implementation Phase is performed for the EPOS SP project. It consists of settling a three-level management system composed by:

1. The **EPOS Risk Management Policy** that sets out the principles, outlines the priorities, assigns responsibility and instructs the project Executive Board to put in place and to follow;
2. The **EPOS SP Risk Management Plan** that covers the processes and activities to be undertaken to give effect to the Risk Management Policy;
3. The dynamic **EPOS SP Risk Register** that comprises a frequently updated database listing all the identified risks, a current assessment of the threat(s) they represent to EPOS SP's success, the entities responsible for taking appropriate action, the potential action, and its current status.

The Risk Register represents a WP1 deliverable (D1.2) submitted in April 2020. The next detailed classification and evaluation will be provided at M30 (D1.5 "Final Report on KPIs and risks monitoring to internal boards").

2.2 Monitoring of Risks

The EPOS SP Risk Register has been compiled starting from the critical implementation risks and mitigation actions included in the EPOS SP DoA. In March 2020, the list of project risks had been revised by each WP Leader in agreement with the WP team and further potential risks have been included. The updated Risk Register has been circulated within the EB Board for written approval.

The updated Risk Register has been then included in the minutes of the 2nd EB meeting held on March the 23rd (Milestone 20) as the project list of risks. The Risk Management Plan and the Risks Register's first release has been submitted as Deliverable D1.2 (M3).

During the 4th EB meeting held in July the 7th, the EB agreed on again updating the Risk Register, including a COVID-19 dedicated risk to limit the damage caused by the force majeure. Measures to limit the related costs and actions to resume the activities implementation have been planned. The risk has been considered at WP level, together with the appropriate mitigation actions. The risk consists of the "delay in achieving/delivering milestones and deliverables due to COVID19".

The Risk Register is considered a live document, and it is updated and monitored regularly (M9, M18, M27, M36) to include new risks if they are identified together with decisions and measures to mitigate them at WP level. Indeed, during the project lifetime, a periodic assessment of the state of the project risks is planned within each WPs and at EB level. Mitigation and contingency measures will be implemented if needed. Unforeseen risks and their proposed risk-mitigation measures can be reported at any time to the Project Coordinator. Once identified, risks are assessed, following a three-point scale, to determine their likelihood of occurrence and their possible impact, quantifying the risks exposure. The risk monitoring consists of watching and periodically revised the risk for changes to the assigned risk parameters, consisting of the level of risk exposure, as specified in D1.2 Risk Register, Paragraph 3.3.2. The risk exposure is calculated with the following formula: Probability x Impact. A three-point scale is used to identify the level of likelihood of occurrence and impact (see Table 1):

Table 1 - Risk likelihood and impact

Scale	Likelihood of occurrence	Impact
1 - Low	Unlikely to occur	Minor impact on time, cost or quality
2 - Medium	May occur occasionally	Notable impact on time, cost or quality
3 - High	Is likely to occur	Substantial impact on time, cost or quality

Considering the risk assessment at M12, the WP Leaders duly implemented mitigation measures to keep risks exposure under control and reduce the likelihood that those risks will happen. In particular, COVID-19 risk of negative impact could significantly affect WP3, and WP5 because of their activities' nature, focusing on cooperation and engagement with stakeholders. WP8 informed that some delays in deliverables might occur due to COVID19. Since tasks 8.2 and 8.3 depend on the outcomes of other WPs, delays might occur later. The overall COVID impact on WP8 will have to be evaluated in a further stage.

Considering the first release at M3 (April 2020), the risk register remains the same after the M9 assessment. The list of risks, including the four unforeseen ones identified by the WP leaders, remains the same. The level of risks exposure does not report any change. M9 risk heat is illustrated in the EPOS SP Risk Heat Map.

The updated Risk Register table is included in this document with the Risk Heat Map, respectively, Annex II and Annex III.

3. Conclusions

The impact and risks assessment undertaken at M9 and reported at M12 with this Deliverable shows that at WP level reported some slight delay in the project performance (e.g. WP3 and WP5) related to the COVID-19 pandemic. The Executive Board agreed that it is too early to plan an extension of the project to reach WPs goals considering there is time to find solutions and establish contingency plans to achieve the overall project lifetime goals.

The KPIs and Risks classification and assessment will be updated at M30, and they will be included in D1.5 "Final Report on KPIs and risks monitoring to internal boards".

ANNEX I – Key Performance Indicators

WP 1 Project Management					
KPI n.	Description	Objective	Purpose	Measure tools	M9
1.1	Percentage of milestones achieved on time	> 85%	To measure the commitment of the beneficiaries to perform their contractual obligation according to the DoA.	Milestones list and review meeting report	85% (16,5/19)
1.2	Percentage of interim-reports (WP reports and financial reports) submitted on time to the Coordinator	> 85%	For the internal monitoring process	Report received	90,63%
1.3	Percentage of beneficiaries attending the PC meetings	> 85%	To measure the commitment of the beneficiaries	Attendance list	87,50%
1.4	Number of EB meetings where decisions are taken	7 (F2F)	To measure the correct implementation of the project	Meeting minutes	5
1.5	Percentage of members attending the EB meetings	> 90%	To measure the commitment of WP Leaders	Attendance list	100%
1.6	Project intranet: satisfaction rate of the members	High	To measure the efficiency of the internal communication tool	Survey	Not relevant for the period

WP 2 Governance and Financial Framework					
KPI n.	Description	Objective	Purpose	Measure tools	M9
2.1	Number of engaged national authorities from countries previously involved in EPOS but not yet ERIC members	> 4	Strengthen connections with countries not yet ERIC members	ERIC membership	1
2.2	Number of national authorities engaged from countries not yet involved in EPOS	> 2	Strengthen connections with countries not involved in EPOS	NACB/ERIC Membership	6
2.3	Number of Meetings of the NACB	> =2	engaging national authorities to follow EPOS ERIC and its delivery framework	Number of meetings and attendance list	1
2.4	Percentage of members attending the NACB meetings	> 50%	To measure the interest of the representatives of Countries not members of the ERIC in EPOS	Attendance list	77,78%
2.5	Number of initiatives organized by EPOS ERIC and EPOS Community in the Baltic Region	> 2	Engage scientists and other stakeholders, including data providers from solid Earth science, in the A Baltic region	Attendance list and communities involved	Not relevant for the period
2.6	Number of initiatives organized by EPOS ERIC and EPOS Community in the A-D-B Region	> 2	Engage scientists and other stakeholders, including data providers from solid Earth science, in the Adriatic-Balkans-Dinarides region	Attendance list and communities involved	Not relevant for the period

WP 3 Global Dimension, European and International Cooperation					
KPI n.	Description	Objective (Target)	Purpose	Measure tools	M9
3.1	Number of coordination activities and events to establish and/or strengthen collaboration with other solid-Earth RIs and similar initiatives at an international level	4	To foster collaboration between selected initiatives relevant to the solid Earth domain	Summary report including actions for each coordination activity with relevant global initiatives where EPOS participated	Too early to be measured
3.2	Number of partnerships established with other solid-Earth RIs and similar initiatives at international level	5	To foster collaboration with other solid-Earth RI at international level	Number of formal partnership agreements (MoU/Lol) with other solid-Earth RIs and similar initiatives at international level.	Too early to be measured
3.3	Number of pan-European thematic initiatives not currently part of EPOS that could contribute to or benefit from becoming part of EPOS.	7	To foster links with pan-European thematic initiatives not currently part of the EPOS RI	List of relevant pan-European thematic initiatives	Too early to be measured
3.4	Number of partnerships with relevant national and international institutions, initiatives and research infrastructures in Africa and Latin America working in the solid Earth domain	>3	Develop and document in a white paper the strategy for a coordinated and coherent approach to collaboration with relevant African and Latin American institutions and initiatives in the solid Earth domain	List of relevant institutions and initiatives from Africa and Latin America working in the solid Earth domain	Too early to be measured
3.5	Number of international meetings and initiatives where EPOS participated	> 6	Community Building	Number of summary report on EPOS participation	Too early to be measured
3.6	Number of international meetings and initiatives organised by EPOS	> 2	Community Building	Number of summary reports on activities	Too early to be measured
3.7	Number of new partnerships with relevant EU-level initiatives that extend the geographical coverage of EPOS Infrastructure	> 2	To measure collaborations established with selected pan-European initiatives	Number of collaboration agreements signed, or in preparation	Too early to be measured

WP 4 Increasing value for users						
KPI n.	Description	Objective (Target)	Purpose	Measure tools	M9	Comments
4.1	Number of tickets resulting from technical audit of ICS code	4/mth. (1hr./tick.)	To increase technical robustness	List of issues to troubleshoot in the ICS code provided by EPOS ERIC (resulting from EPOS IP and other EPOS collateral activities) to the WT. 4.1 Leader	N/A	Setup of a regular ticketing platform for managing the records of requests. The system will be effective before next KPI monitoring deadline.
4.2	Number of services tested and validated in the operational infrastructure	>5	To foster the long-term data integration plan, following the state of the art as advertised in the technical debt document to avoid a. the high probability of collateral effects, resulting in loss of time; b. the difficulty to share knowledge, resulting in a small core dev team, which is not sustainable	Number of data services implemented and validated into the operational platform according to the QA pipeline	>5	
4.3	Number of new users' groups (communities at regional or thematic level, laboratories providing TNA services within EPOS Delivery Framework) engaged	4	Task 4.2 and 4.3 deal with the engagement of new user groups. The confirmation of their engagement within the duration of the project is a performance indicator about the capacity of EPOS Delivery Framework to satisfy the expectations of new scientific partners.	New communities integrated in the EPOS Delivery Framework as consequence of EPOS SP development	2 (>4)	User groups from geodetic and seismologic community in ADB region is engaged. More user groups from GNSS are interacting with WT 4.5 task partners for the affiliation to the TCS and the exploitation of EPOS ICS
4.4	Number of GNSS data stakeholders engaged in service integration process	1	The effectiveness and the sustainability of solutions and guidelines provided to the GNSS and the added value of the formalization of the concerned TCS within the EPOS Delivery Framework, will be evaluated by the capacity of engaging new entities of this community to integrate their services and data in EPOS ICS-C	Number of new entities concerned by the GNSS domain, contributing to the Delivery Framework by the provision of new GNSS data or services	About 20	
4.5	Number of National Space Agencies engaged	2	To increase and test the sustainability framework of the EPOS Thematic Core Service (TCS)	Number of National Space Agencies not yet involved in EPOS accepting formal link with its Delivery Framework	>2	
4.6	Number of successful migration tests with different European cloud computing initiatives	>2	Testing and evaluating the compatibility of EPOS with other cloud computing initiatives, as contribution to a robust sustainability framework for TCS services.	Number of migration experiments within different environments (DIAS, EOSC, etc...) evaluating their capacity to provide sustainable services in the EPOS framework, in terms of: - access speed to the data archive - computing resources performance		Agreement and design for the experiments still in progress.

				<ul style="list-style-type: none"> - computing resources scalability - disk access bandwidth <p>The cost is a distinctive parameter for the sustainability assessment</p>		
4.7	Satisfaction rate of services provided	majority of answers with satisfaction rate > 6	Testing and improving TCS-ICS services for enhanced user experience and trust	Questionnaires dedicated to users engaged in Users Feedback Groups (to test and assess the functionalities and the readiness of the EPOS Delivery Framework) concerning specific elements of the service provided by the platform (both ICS-C and eventually ICS-D). The answers are rated between 1 (negligible) and 10 (very satisfied)		Questionnaires not yet submitted
4.8	Satisfaction rate of users on the functionalities and readiness of the EPOS Delivery Framework	majority of answers with satisfaction rate > 6	Testing and improving TCS-ICS services for enhanced user experience and trust	Questionnaires dedicated to users engaged in Users Feedback Groups (to test and assess the functionalities and the readiness of the EPOS Delivery Framework) concerning specific elements of the GUI, the implemented functionalities and the usability. The answers are rated between 1 (negligible) and 10 (very satisfied)		Questionnaires not yet submitted

WP 5 Strengthening Links with private sector					
KPI n.	Description	Objective (Target)	Purpose	Measure tools	M9
5.1	Number of public and commercial institutions/companies interested in pilot services offered	8	To measures the potential of pilots to attract the private and public organizations; to allows to react and improve the pilots during the project	Number of commercial organisations visiting EPOS website measured through the AAAI accounting tool and the metadata characterisation of the registered user	Too early to be measured
5.2	Number of users visiting or using R&I web resources or APIs	100	To measures how is the commercial interest in EPOS assets, and in which areas this interest can be developed)	Number of users within commercial organisations through web log statistics and API statistics related to attribution of user to organisation	Too early to be measured
5.3	Number of visits of the web resources related to R&I	1000	To measures how is the commercial interest in EPOS assets, and in which areas this interest can be developed)	Number of visits to EPOS website by commercial organisations users through web log statistics and API statistics related to attribution of user to organisation	Too early to be measured
5.4	Number of new assets in the catalog as R&I services	10	To measure how rich R&I service of EPOS is and it will give later on, after some time since the implementation, the information how is the interest of using this service	Number of new EPOS assets provided and used by commercial organisations from web and API logs	Too early to be measured
5.5	Number of EPOS common undertakings with the private sector	6	bi-directional collaboration; it measures how EPOS fosters the collaboration between the science and private sector); target is one per TCS involved in WP%	Number of EPOS assets provided by joint work with commercial organisations	Too early to be measured

WP 6 Value for society					
KPI n.	Description	Objective (Target)	Purpose	Measure tools	M9
6.1	Degree of awareness for ethical principles among EPOS services	high	Reaching a high degree of awareness for ethical principles among EPOS services.	Report based on a collection of existing ethical principles and supplemented by a survey.	On track
6.2	Amount of EPOS products and services relevant for seismic hazard and risk	medium	Measuring the amount of products and services relevant for seismic hazard and risk.	Qualitative and quantitative survey	On track
6.3	Degree of awareness of EPOS core services to adhere FAIR principles	high	Reaching a high degree of awareness of EPOS services to adhere FAIR principles.	Survey	On track

WP 7 Outreach and Training						
KPI n.	Description	Objective (Target)	Purpose	Measure tools	M9	Corrective Actions
7.1	Training: Number of training sessions	3	Contributing to the usage of the EPOS contents / services / Engaging stakeholders	Training plan	3	Virtual event
7.2	Training: Number of industrial users involved in trainings	3	Contributing to the usage of the EPOS contents / services / Engaging stakeholders	Participant lists	4	Virtual event
7.3	Training: Number of researchers involved in trainings	40	Contributing to the usage of the EPOS contents / services / Engaging stakeholders	Participant lists	107	Virtual event
7.4	Training: Number of early career scientists and students involved in trainings	30	Contributing to the usage of the EPOS contents / services / Engaging stakeholders	Participant lists	30	Virtual event
7.5	Training: Number of questionnaires submitted (within six months after the training)	50	Contributing to the usage of the EPOS contents / services / Engaging stakeholders	Questionnaire	41	Virtual event
7.6	Training: Number of views of each training video	30	Maximize dissemination of EPOS results	Analytics	190	Virtual event
7.7	Training: Number of tutorial documents opened/downloaded	30	Maximize dissemination of EPOS results	Analytics	NA	
7.8	Outreach: Number of outreach events	3	Maximize dissemination of EPOS results	report	4	Virtual event
7.9	Outreach: Number of industrial users attending the events	15	Maximize dissemination of EPOS results	Participant lists	4	Virtual event
7.10	Outreach: Number of researchers attending the events	300	Maximize dissemination of EPOS results	Participant lists	107	Virtual event
7.11	Outreach: Number of early career scientists and students attending the events	100	Maximize dissemination of EPOS results	Participant lists	30	Virtual event
7.12	Outreach: Number of government Officials attending the events	20	Maximize dissemination of EPOS results	Participant lists	NA	Virtual event
7.13	Outreach: Number of participants from the targeted regions	100	Maximize dissemination of EPOS results	Participant lists	38	Virtual event
7.14	Outreach: Number of participants from existing thematic groups	100	Maximize dissemination of EPOS results	Participant lists	107	Virtual event
7.15	Outreach: Number of participants from new thematic groups	40	Maximize dissemination of EPOS results	Participant lists	NA	
7.16	Outreach: Number of outreach materials	7	Maximize EPOS communication and dissemination of results	Report on Dissemination and communication materials	3	

7.16.1	Number of Brochure (per year/ per target audience)	1	Maximize EPOS communication and dissemination of results	Report on Dissemination and communication materials	NA	
7.16.2	Number of Flyers (per year)	4	Maximize EPOS communication and dissemination of results	Report on Dissemination and communication materials	1	
7.16.3	Number of leaflet/posters (each event)	2	Maximize EPOS communication and dissemination of results	Report on Dissemination and communication materials	2	
7.17	EPOS website -percentage of unique new visitors of 10 most visited pages (per year)	40%	Maximize EPOS communication and dissemination of results	google analytics/report of dissemination & communication - qualitative analysis	88%	
7.18	D&C: SP website pages - number of views/unique new visitors (monthly average)	20	Maximize EPOS communication and dissemination of results	Analytics	1310/866	
7.19	Social media - Twitter - Number of SP tweets (monthly average)	8	Maximize EPOS communication and dissemination of results	twitter stats/Analytics	12 in tot, 1,333 monthly avg.)	
7.20	Social media - Twitter - Number of impressions of SP tweets / qualitative analysis of new followers /	high /expected/ Low	Maximize EPOS communication and dissemination of results	twitter stats/Analytics	low	
7.21	social media - Facebook SP - number of posts related to SP (monthly average)	8	Maximize EPOS communication and dissemination of results	google analytics	3	
7.22	social media - LinkedIn SP - number of posts related to SP	8	Maximize EPOS communication and dissemination of results	google analytics	0	
7.23	social media - YouTube SP - number of videos created by SP (webinars- tutorial- e-learning, trainings- use cases - interviews))	10	Maximize EPOS communication and dissemination of results	report on Dissemination and communication materials	2	
7.24	Number of visualisations of SP videos on YouTube	100	Maximize EPOS communication and dissemination of results	google Analytics	0	
7.25	Newsletter - Number of SP articles (per year)	8	Maximize EPOS communication and dissemination of results	mail Chimp statistics	0	
7.26	Number of Scientific publications linked to EPOS SP project	2	Maximize EPOS communication and dissemination of results	Publications suggested by Open AIRE / EU portal, continuous reporting	2	

WP 8 Impact on Long-term sustainability						
KPI n.	Description	Objective (Target)	Purpose	Measure tools	M9	Comments
8.1	Percentage of service providers having completed the questionnaire (Linked to WP2)	80%	Sustainability of service provision	service providers contacted + questionnaires completed	N/A	Too early to be measured: survey will take place in 2021.
8.2	Percentage of contacted data providers having completed the questionnaire	30%	Sustainability of data provision	data providers contacted + questionnaires completed	N/A	Too early to be measured: survey will take place in 2021.

ANNEX II – Risk Register

¹⁾LoO=Likelihood of occurrence: 1-Low; 2-Medium; 3-High;

²⁾Impact: 1-Minor; 2-Notable; 3-Substantial;

³⁾The Risk register will be updated at any reporting period (M9, M18, M27, M36);

⁴⁾ insert comment if needed; mandatory if the risk mitigation measures have not been applied.

Risk No	Description	WP	Risk Mitigation Measures	¹⁾ LoO	²⁾ Impact	Risk Heat (M3)	³⁾ Did you apply the risk-mitigation measures? (Y/N)	³⁾ Did the risk materialise? (Y/N)	^{3,4)} Comments	³⁾ Contingency Plan (if any)
1	Failure to reach the objectives on time and on budget.	WP1	Careful monitoring of the task progress and early identification of the problems that may arise will be assessed by the Project Coordinator and the ECO.	1	2		Y	N		
2	Communication within the project is not sufficient.	WP1	The Coordinator will set up more face2face meetings and teleconferences to increase the cross-fertilization in the project.	1	2		Y	N		
3	Poor performance of partners.	WP1	The contingency plan is activated in case a partner submits the work with a delay of more than a week (from the internal deadline) without justification. The partner is asked to justify the delay and set a new deadline. If this situation is repeated then the EB will discuss and decide appropriate measures.	1	2		Y	N		
4	Delays in project timetable.	WP1	The PC agrees and applies contingency plans including (i) re- allocation of resources, (ii) parallel execution of tasks, (iii) re- scheduling of activities.	2	2		N	N	This risk is mitigated carefully monitoring the project activities progress by the EB and the Coordinator.	

5	Turnover of staff at partner Institutions.	WP1	Participating institutions have a duty to respect the contract with the European Commission and ensure the completion of work. Partners will have responsibility to inform the coordinator timely of such an event and ensure proper handover of the job. Finally, the transfer of a certain task to other team member with relevant expertise can be considered to carry out the corresponding tasks.	3	2		Y	N		
6	Conflict between Partners.	WP1	Legally binding consortium agreement. Mediation by Coordinator.	2	2		Y	N		
7	Non-acceptable quality of the deliverables.	WP1	There is a procedure in the proposed project management schema, based on the review of deliverables by the WP Leader and the ECO to guarantee the quality of the final deliverables.	1	1		Y	N		
8	Failure in engaging National Authorities.	WP2	Foster the establishment of national consortia, Joint Research Units, and engagement of national teams.	2	2		Y	N		
9	Failure in identifying mechanisms for the in-kind contributions through national funds.	WP2	Involve legal offices in the process.	2	3		Y	N		
10	Lack of engagement from solid Earth Research Infrastructures and similar related initiatives in other regions.	WP3	Establish links with relevant global coordinating activities and initiatives to establish channels of communication and foster collaboration e.g. Research Data Alliance (RDA), One Geology, ICSU-WDS.	2	1		Y	N		
11	Poor attendance at the planned Conferences, especially from stakeholders in Africa and Latin America.	WP3	Ensure the locations for these conferences are accessible as possible for stakeholders from these regions. Engage with local organisers at an early stage to promote and encourage participation.	2	2		Y	Y	This risk was amplified by the COVID-19 pandemic	GSN Namibia was selected as a reliable and reachable host for the first Conference.

12	Missed information dissemination between WP participants which would lead in overall delay.	WP4	The User Value Board will focus on high level of delegation from WP Leader to task manager, and improve communication efficiency. The work package will leverage the tools and workflows used in EPOS IP when feasible.	1	1		Y	N		
13	Delay in providing plan and guidelines for engaging new communities.	WP4	The work package will focus on these deliverables before engaging too much with the new communities.	1	1		Y	N		
14	Plan for industry engagement fails.	WP5	Revise plan rapidly taking advice from industry and from other projects.	2	2		Y	N	Situation monitored during online task leaders' meetings.	During the lockdown we asked for advice, network and stay in touch with TCS AH Innovation Advisory Board, and industry companies, as well as initiated the contact with ENRIICT project coordinator.
15	Governance of EPOS relationship with Private Sector unacceptable to Private Sector.	WP5	Revise governance in accordance with wishes of industry and experience of other projects with advice from EPOS legal team.	1	2		Y	N		
16	Pilots fail technically or otherwise do not convince industry.	WP5	Redefine pilot to ensure success and engage with industry to gain greater cooperation.	1	2		Y	N		
17	Industry has no interest in EPOS Research and Innovation Services.	WP5	Engage other industry sectors – especially ICT – to gain interest and hence sustainability.	2	2		N	N	Too early in the project timetable	
18	Lack of response to consultation / interaction	WP6	Start requesting input/feedback as early as possible, use established direct links between	1	2		Y	Y	Has been detected significant differences in users' willingness of	On the platforms, where there

	requests from stakeholders external to EPOS.		WP partners and relevant externals to gather feedback.						different platforms to participate in an online survey that has been launched by task 6.2.	was a low response rate, WP6 additionally advertised the survey of task 6.2 using different channels.
19	Lack of response to consultation / interaction requests from stakeholders internal to EPOS.	WP6	Start requesting input/feedback as early as possible, utilize EPOS meetings to directly engage with relevant individuals, engage the EPOS management in requesting feedback.	1	3		Y	N	The collaboration with EPOS partners for the first surveys WP6 has conducted has been very positive and efficient.	Not applicable
20	Fail to engage participation from targeted regions.	WP7	Identify the reasons for missing engagement after the first workshops and events and adopt alternative measures in the following planned activities.	2	1		N	N	We have managed to engage 46 participants from the Adriatic-Balkan-Dinarides region.	Not applicable
21	Fail to engage participation from the new Thematic Core Services (TCS).	WP7	Identify the reasons for missing engagement after the first workshops and events and adopt alternative measures in the following planned activities.	2	2		N	N	The planned sessions targeted for new thematic communities have not yet taken place. These are planned later in the project.	not applicable
22	Insufficient information flow from WP2-7.	WP8	Risk-mitigation: dedicated face to face meeting members to facilitate interactions.	1	3		N	N	Discussions with WPs have been organised virtually because of COVID19. Information flow is acceptable but would probably have been better face to face. We predict that the quality of information from WPs will improve as the level of maturity within the project increases.	Face to face meetings could possibly be held once travel restrictions are lifted to complete the information from WPs 2-7.
23	Lack of engagement of data providers for landscape analysis on data provision.	WP8	Interaction with General Assembly and NACB members to facilitate interactions.	2	2		N	N/A	Information about the landscape analysis etc has been disseminated across the EPOS sphere but it is still	Not applicable

									too early to contact data providers directly in the framework of the survey.	
U1	Delays in implementing TCS services in the EPOS infrastructure, mainly due to unexpected development demand and unavailability of IT development resources.	WP4	The "TCS-ICS interactions team "provides a roadmap & prioritization of development needs, structured in pitches according to "Shape Up" methodology, that allow to verify and adequately plan and distribute ICS and TCS IT human resources.	1	3		Y	N		If this risk becomes effective, the ICS-TCS will reschedule activities and resources by reviewing the priority list of pitches.
U2	Products of the various tasks result too heterogeneous and incongruent with the requirements and expectations of WP8.	WP4 (WP8)	An internal document including a questionnaire and a schedule of internal intermediate deliverables, transversal to the different tasks of WP4, is agreed with WP8 leader and shared among WP4 Task leaders.	1	2		N	N	Too early in the project timetable	
U3	Lack of alignment of expectations between EPOS SP/EPOS ERIC, especially regarding the information from other WPs to include in the Long-Term Sustainability Plan.	WP8	Coordination through EB, dedicated meetings within WP8, ad hoc meetings WP8 leader/EPOS ERIC to adjust alignment whenever needed.	2	3		Y	N	Changes in the EPOS landscape happen constantly which is reflected in WP8, where all actions crystallise. The impact is especially strong on the sustainability plan. However, WP8 is not only the result of the other WP; it needs to be defined exactly what input and in what form that should be delivered. This complexity, unique for WP8, might have been underestimated in the DoA.	

Risk No U4	Description	WP	Risk Mitigation Measures	¹⁾ LoO	²⁾ Impact	Risk Heat (M3)	³⁾ Did you apply the risk-mitigation measures? (Y/N)	³⁾ Did the risk materialise ? (Y/N)	^{3,4)} Comments	³⁾ Contingency Plan (if any)
	Delay in achieving and/or delivering milestones and deliverables due to COVID19 pandemic.	WP1	The Coordinator requests all the WP Leader to include a risk linked to COVID-19 in the internal risk register, identify and apply a relevant mitigation measure within each WP. Contingency plans will be implemented if needed.	2	3		Y	Y		
	Delay in achieving and/or delivering milestones and deliverables due to COVID19 pandemic.	WP2	1. Integrating of the virtual communication tools in the implementation of WP2 activities 2.Strengthening the communication with WP8	2	3		Y	N		Not applicable
		WP3	Starts remote promotional activities to create momentum around the EPOS Conferences.	2	3		N	Y	July 2021 seems the earliest likely date when the first conference will be possible, and January 2021 is an appropriate date to start the promotion.	Promotional activities need to be carefully timed in order to prevent the dissipation of momentum due to a long wait.
		WP4	The WP leader informs the LP and proposes a new deadline, paying attention to limit and mitigate the impacts on other project activities	2	3		Y	Y		New timelines and types of events have been identified for milestone meetings for the NWT 4.3. The virtualization of the meetings via web hosted video-conference platforms has enabled the achievement of planned objectives within the re-scheduled deadlines.

		WP5	Acknowledging the missed deadline and resulting delay as soon as possible; Identifying and evaluating the alternatives.	2	3		Y	N	Not applicable
		WP6	Best effort to compensate despite the difficult circumstances	2	3		Y	N	MS77 delayed by two months Not applicable
		WP7	Identify there are delays in deliverables and find out the reasons for possible delays.	2	3		N	N	Currently there has not been any delays on achieving/delivering milestones and deliverables. Not applicable
		WP8	Discussions within WP + interaction with EB and ECO to replace face to face meetings with virtual meetings. When there's a better overview on the pandemic situation, face to face meetings could be rescheduled.	2	3		Y	Y	Some delays in deliverables might occur due to COVID19. Since tasks 8.2 and 8.3 depend on the outcomes of other WPs, delays might occur later. The overall COVID impact on WP8 will have to be evaluated later on. WP8 has adapted its action by virtual meetings instead of face to face, but this approach has its limits.

ANNEX III - EPOS SP Risk Heat Map (M9)

