

## D1.2 – Risk Management Plan

Work Package	WP1, Project Management & Technical Coordination
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0.8	08/11/2022	Giovanni Barone (ENG)	Final draft

## Terminology

Terminology/Acronym	Description
CA	Consortium Agreement
DoA	Description of Action
EC	European Commission
EO	Earth Observation
EU	European Union
HPC	High Performance Computing
GA	Grant Agreement to the project
GIS	Geographic Information Systems
KPI	Key Performance Indicator
ML	Machine Learning
MoM	Minute of Meeting
PC	Project Coordinator
PMB	Project Management Board
TM	Technical Manager
ToC	Table of Content
WP	Work Package

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## Executive Summary

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This document is the second deliverable of EO4EU (D1.2) and it contains the Risk Management plan. It has been elaborated by WP1 and reviewed by the consortium.

Overall, the scope of the Risk Management plan is to describe the managerial dashboards set up for the execution of EO4EU so that the project could produce the expected results with best quality and ensure smooth communication between project partners.

It is organised into the following sections:

- Introduction: includes the aim of this report, the list of reference documents and the deliverable structure description.
- Project overview: a short description of the project. Purpose, goals and technologies are briefly described in this section, along with brief architecture description.
- Quality Plan: all procedures and agreements. Moreover, a shared with all project partners are described in this section in order to ensure the quality management of the project.
- Risk Management & Mitigation Plan: summarises the procedures related to risk management and mitigation procedures.
- Annexes: an annex appended at the end of this document is related to the Quality Review report.

## 1 Introduction

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### 1.1 Purpose of the document

The Risk Management Plan provides an organized and harmonized set of practical guidelines, procedures and supporting documents that can be used to optimize project implementation and the quality assurance processes. The deliverable will expire on M6, but the supporting documents will be kept updated as needed throughout the life cycle of the project.

This document must be used by all partners to effectively develop their individual and collective activities and contribute to the overall goal of the project.

This document also contains the list of potential risks, for each WP, in both management and technical terms, providing a complete risk management plan. The search for any risks and migration actions as well as the management of procedures and creation of documents in support of Quality assurance does not stop with the expiry of the deliverable but evolves in a continuous updating for the entire duration of the project.

### 1.2 Reference documents

[1] EO4EU Grant Agreement No 101060784– Annex 1 Description of the action

[2] EO4EU Consortium Agreement

[3] EO4EU D.1.1 Project Management Manual

## 2 Project overview

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### 2.1 EO4EU - Goals and technologies

The purpose of the EO4EU is to design and implement a data processing system with the aim of improving and facilitating access to EU EO data offered by a variety of platforms and data archives. Copernicus with the associated platforms such as DIASes, the Galileo / EGNOS service but also platforms and initiatives such as DestinE are the sources of data and services to which EO4EU will access. EO4EU aims to be an extensible and adaptable platform for retrieving, processing, merging and delivering new data sets, without prior knowledge of their structure and format. The Platform will be supported by machine learning algorithms and advanced semantic annotation mechanisms. These innovative approaches act as a solution to the problems of interoperability and homogeneity of EO data, making them relevant, open but above all accessible.

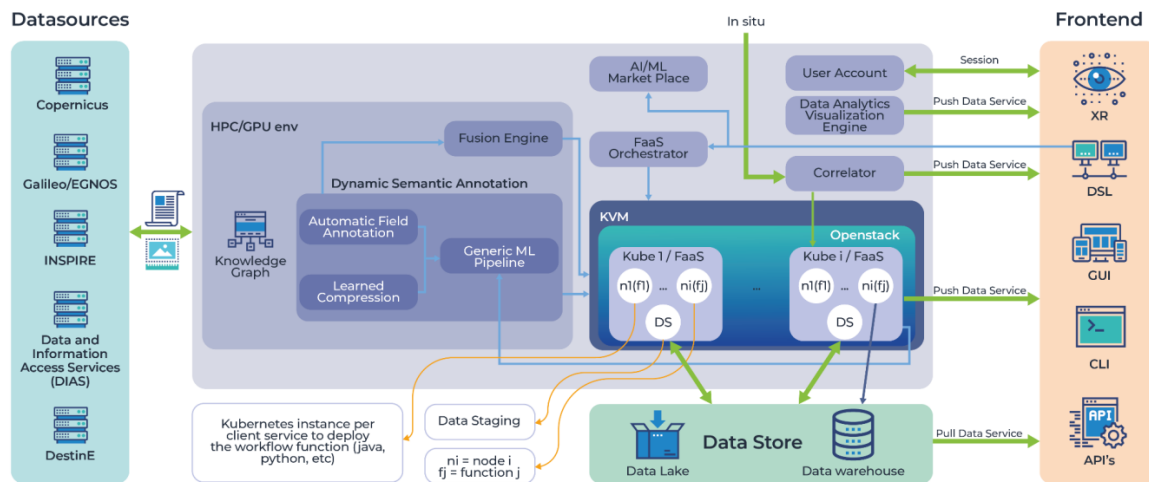
Given the huge volume of EO data and their transmission / caching limitations, for processing on remote systems / platforms, EO4EU is introducing innovative ML-based compression approaches that will improve the accessibility of data sources by reducing their respective volumes of data and therefore the storage and bandwidth requirements.

EO4EU will be deployed on state-of-the-art High-Performance Computing (HPC) and cloud infrastructures equipped with GPUs to support the anticipated compute workloads required for a broad spectrum of use cases. The versatility of the proposed solution will be demonstrated through the integration of multiple and heterogeneous use cases that will include a broad spectrum of users and stakeholders. The platforms, that will be used as use cases, will use the data provided by the EC repositories and will be applied to personalized health services, optimization of shipping routes, food safety considering climate change, forest management, soil erosion affected environmental parasites climatic conditions and the decision-making process of civil protection.

The core functionalities of EO4EU will be implemented using microservices orchestration with Kubernetes Cluster and higher abstraction services such as Function as a Service (FaaS), which allow for flexibility, extensibility and scalability of the platform. The storage required for the EO4EU data store will be dynamically provided to Kubernetes clusters with dynamic allocation of persistent volumes. A range of visualization services and interfaces will also be designed, including a layered user interface (GUI) for visual analysis, a command line interface (CLI) with a respective application programming interface (API) and an extended reality interface (XR) to further increase adoption of the platform.

### 2.2 Brief architecture description

**Data Sources:** The data sources will be linked to the project via open APIs. In addition, data from the European Commission will be used through cloud-based platforms: Copernicus, CAM services, GEOSS, INSPIRE, DestinE, Galileo / EGNOS programs as well as data obtained from direct access to the services provided by ECMWF and the services entrusted to it.



**Figure 1. EO4EU Conceptual Architecture**

**Knowledge Graph & ML based Processing:** Knowledge Graph-based decision making enhances knowledge-based decision support. According to this approach, decisions are considered as descriptive knowledge themselves. In EO4EU, the synergy between decision-making and knowledge management will be further strengthened using appropriate functionalities that, by controlling the consequences of information overload, hide the complexity of models behind generic and easy-to-use user interfaces.

The semantic annotation of EO data introduced by the EO4EU platform will lead to a reduction in the minimum amount of data necessary for each case of use. Annotated / tagged images are required to train supervised machine learning algorithms. The main challenges, when requiring a high volume of tagged data, arise from the high cost of human labor of manual tagging and the difficulty of tagging complex and ambiguous satellite imagery content. The EO4EU generic ML pipeline will allow the automatic learning and labeling of a representation of the input data in a latent space, without supervision. EO4EU will mainly rely on approaches such as SimCLR28, which is a framework for the contrasting learning of visual representations but in parallel other approaches such as Mocov229 and any other new work in this rapidly evolving research area will be evaluated. This representation will provide the input representation on which the downstream tasks will operate for learning specific patterns of the task. It will allow owners of downstream activities and their use cases to easily train such activity-specific models with minimal data labeling effort.

**Data Store:** Data Lake is a container of "raw" observational and forecasting data. Data from various data sources will be stored in the Data Lake, to allow access to users and software components. Data Warehouse stores structured data. Data warehousing creates a collection of historical data that can be retrieved and analyzed to provide useful information about the operations of the organization.

**Front-end:** An intuitive web-based graphical user interface will provide the ability for interaction to both the more advanced user and the simple viewer, minimizing the cognitive load. A key feature of the user interface (UI) is the adaptability provided through a fully configurable dashboard that will be able to customize the viewable components according to the user's needs. The dashboard will also rely on open standards to collect data from the infrastructure, thus enabling the interface between the back-end system and the dashboard for easy and secure communication and data transfer. It will also have the ability to be configured with open APIs to interface with user applications to present data meaningfully to customers.

## 3 Quality Plan

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### 3.1 Template and Naming

#### 3.1.1 *Template for deliverables*

The following templates will be used for the preparation of EO4EU deliverables and reports. They are available on the project web site (private area) or from the Technical Coordinator or Project Coordinator.

- Template for deliverables
- Template for Minute of the Meeting (MoM) and internal Telcos
- Templates for presentations
- Template for Progress Reports (also reported on D1.1)
- Template for the Periodic Reports
- Template for Quality Review Report (to be added at the end of each deliverable)

All templates are already available on the EO4EU SharePoint portal.

#### 3.1.2 *Files and Archives*

All project documents are made accessible to all project participants. The tool used for sharing documents is SharePoint of MS Office 365. The document portal contains a dedicated section for each WP and in addition a General section contains templates, project photos and all the documentation supporting the project.

#### 3.1.3 *Documents Naming*

Proper document naming is essential in order to keep track of the project technical and administrative resources. The naming of the deliverables in EO4EU should follow the following convention:

EO4EU - Dw.d\_NAME\_vx.y.ext

Example: EO4EU\_D.1.2\_Risk management plan\_v0.1.doc

in which

- w: is the work package number.
- d: is the deliverable number.
- NAME: is the complete name of the deliverable (as indicated in D1.1).
- x: is the version major number.
- y: is the version minor number.
- ext: is the extension (.doc, .ppt, .xls).

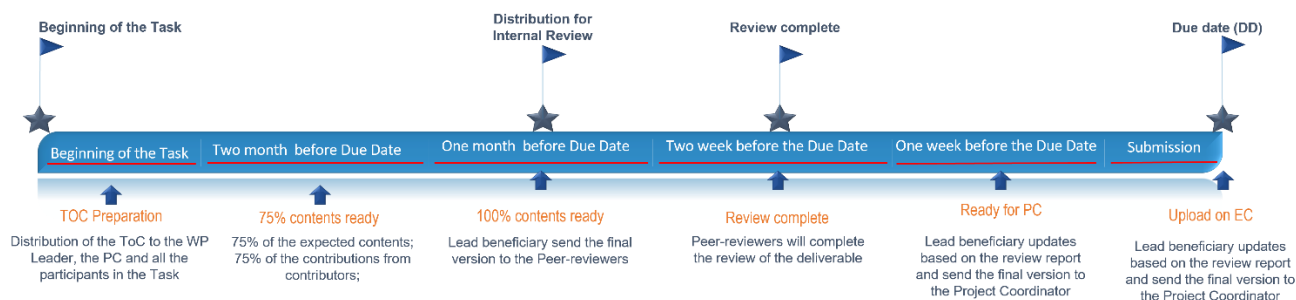
The final version of the deliverable should be released as pdf document and with version v1.0.

In case of remarks made after submission, the version number will continue to increase the version minor number eg. v1.1.

### 3.1.4 Quality control of deliverables

The process of producing the deliverables in EO4EU should also involve WP Leaders and all participating partners. In the deliverable life cycle, it is possible to identify the following steps:

- ToC generation: the main beneficiary of the deliverable prepares and distributes the Table of Content (ToC) of the deliverable at the beginning of the task to the WP Leader, the Project Coordinator and all the participants in the Task, inviting them to provide their contribution based on the respective specific skills.
- Deliverable implementation: in order to have a better management of contents and contributions, the implementation of the deliverable takes place in two phases.
  - Two months before the final date of the deliverable, the main beneficiary will implement 75% of the expected contents and in the same way will receive 75% of the contributions from the contributors.
  - One month before the final submission date, the primary beneficiary submits the content 100%, in the same way for the contributors of the deliverable, to the reviewers.
- Internal review: one month before submission date the main beneficiary of the deliverable will send the final version to the peer-reviewers who will complete the review of the deliverable. In addition, the peer-reviewers will fill in the review form (see Annex A "Quality Review Report"). The deadline for reviewers will be set two weeks before submission date
- Final version: the lead beneficiary will make the necessary corrections and updates based on the review reports above and send the final version to the project coordinator one week before submission date.
- Upload to EC: the coordinator approves it, converts it into PDF format and uploads it on EC portal before the expiry date.



**Figure 2. Timeline for deliverable preparation**

The reviewers for each deliverable were identified at the start of the project and approved by all partners. The appointment of reviewers for each deliverable will be based on some basic rules:

- Two reviewers are assigned for each deliverable.
- The reviewer cannot coincide with the deliverable beneficiary.
- The deliverables will be assigned equally among all project participants.
- Whenever possible, reviewers will be assigned considering technical expertise.

Each major beneficiary of the deliverable will be responsible for producing the Deliverable on the due date in consultation with their respective WP Leader and Project Coordinator.



Quality assurance manager, with project coordinator should monitor the quality management process, and make sure deliverables are submitted on time by main beneficiaries, additionally, he should monitor the review process and make sure reviewers submit their feedback on time to the main beneficiary.

Any deviation from the process, QA manager should raise the flag and make sure to bring things back on track.

The internal reviewer was thus identified in a preliminary manner as in the following table:

Del. Num.	Deliverable name	Lead	Type	Int. Rev/er #1	Int. Rev/er #2	Delivery date
<b>D1.1</b>	Project management manual	<b>ECMWF</b>	R	NVCR		M3
<b>D1.2</b>	Risk management plan	<b>ENG</b>	R	CMCC	IES	M6
<b>D1.3</b>	Data management plan (a)	<b>NVCR</b>	R	ECMWF	DANAOS	M6
<b>D1.4</b>	Data management plan (b)	<b>NVCR</b>	R	NKUA	ENG	M18
<b>D1.5</b>	Data management plan (c-final)	<b>NVCR</b>	R	CINECA	HES-SO	M33
<b>D1.6</b>	Annual progress reports (a)	<b>NKUA</b>	R	VU	IES	M12
<b>D1.7</b>	Annual progress reports (b)	<b>NKUA</b>	R	CMCC	LU	M24
<b>D1.8</b>	Annual progress reports (c)	<b>NKUA</b>	R	SIS	TRUST-IT	M33
<b>D1.9</b>	Annual progress reports (d-final)	<b>NKUA</b>	R	KEMEA	NVRC	M36
<b>D1.10</b>	Legal and Ethical issues and Guidelines (a)	<b>NKUA</b>	R	EBOS	FMI	M12
<b>D1.11</b>	Legal and Ethical issues and Guidelines (b final)	<b>NKUA</b>	R	TRUST-IT	KEMEA	M20
<b>D2.1</b>	Research and Innovation Landscape analysis report	<b>SIS</b>	R	NKUA	HES-SO	M9
<b>D2.2</b>	EO4EU End-user Requirements Analysis & Business process flows (a)	<b>ECMWF</b>	R	LU	HES-SO	M18
<b>D2.3</b>	EO4EU End-user Requirements Analysis & Business process flows (b-final)	<b>ECMWF</b>	R	FMI	NVCR	M24
<b>D2.4</b>	Technical, Operational and Interoperability specifications and Architecture	<b>NKUA</b>	R	SIS	CINECA	M18
<b>D3.1</b>	Knowledge Graph Configuration Manual &Deployment	<b>NVCR</b>	R	ECMWF	IVI	M18
<b>D3.2</b>	EO4EU automated systems and services (a)	<b>NKUA</b>	OTHER	MEE0	LU	M18
<b>D3.3</b>	EO4EU automated systems and services (b final)	<b>NKUA</b>	OTHER	CINECA	IES	M24
<b>D3.4</b>	ML methods, models, and documentation	<b>HES-SO</b>	R	EBOS	SIS	M18
<b>D3.5</b>	Customer facing services increased information uptake (a)	<b>EBOS</b>	R	VU	TRUST-IT	M18

Del. Num.	Deliverable name	Lead	Type	Int. Rev/er #1	Int. Rev/er #2	Delivery date
<b>D3.6</b>	Customer facing services increased information uptake (b-final)	<b>EBOS</b>	R	CMCC	NKUA	M30
<b>D4.1</b>	Infrastructure & Services Definition (a) WP4 12 - EBOS R — Document, report PU - Public 18	<b>EBOS</b>	R	LU	ECMWF	M18
<b>D4.2</b>	Infrastructure & Services Definition (b final)	<b>EBOS</b>	R	CINECA	NKUA	M24
<b>D4.3</b>	Cloud infrastructure deployment and configuration report (a)	<b>CINECA</b>	R	NKUA	FMI	M18
<b>D4.4</b>	Cloud infrastructure deployment and configuration report (b-final)	<b>CINECA</b>	R	EBOS	NKUA	M28
<b>D4.5</b>	Release of -Serverless-Infrastructure Configuration management as a service (a)	<b>NKUA</b>	OTHER	TRUST-IT	VU	M18
<b>D4.6</b>	Release of -Serverless-Infrastructure Configuration management as a service (b final)	<b>NKUA</b>	OTHER	NVRC	MEE0	M30
<b>D4.7</b>	Release of the integrated framework [Dev &Production level] (a)	<b>ENG</b>	OTHER	IES	KEMEA	M18
<b>D4.8</b>	Release of the integrated framework [Dev &Production level] (b-final)	<b>ENG</b>	R	MEE0	EBOS	M33
<b>D5.1</b>	Pilot Implementation methodology and release of evaluation guidelines (a)	<b>SIS</b>	R	ECMWF	LU	M12
<b>D5.2</b>	Pilot Implementation methodology and release of evaluation guidelines (b-final)	<b>SIS</b>	R	NKUA	FMI	M18
<b>D5.3</b>	Demonstrator's performance evaluation & appraisal reports (a)	<b>FMI</b>	R	NVCR	EBOS	M18
<b>D5.4</b>	Demonstrator's performance evaluation & appraisal reports (b)	<b>FMI</b>	R	CINECA	SIS	M24
<b>D5.5</b>	Demonstrator's performance evaluation & appraisal reports (c)	<b>FMI</b>	R	VU	ENG	M32
<b>D5.6</b>	Demonstrator's performance evaluation & appraisal reports (d-final)	<b>FMI</b>	R	CMCC	KEMEA	M35
<b>D5.7</b>	User Acceptance impact assessment report (a)	<b>KEMEA</b>	R	TRUST-IT	IES	M24
<b>D5.8</b>	User Acceptance impact assessment report (b-final)	<b>KEMEA</b>	R	IES	TRUST-IT	M33
<b>D5.9</b>	EO4EU Services Report & Thematic Policy Recommendation	<b>DANAOS</b>	R	KEMEA	IVI	M33
<b>D6.1</b>	Dissemination and Communication Plan & Continuous monitoring (a)	<b>TRUST-IT</b>	R	LU	NKUA	M6
<b>D6.2</b>	Dissemination and Communication Plan & Continuous monitoring (b)	<b>TRUST-IT</b>	R	FMI	ECMWF	M18
<b>D6.3</b>	Dissemination and Communication Plan & Continuous monitoring (c)	<b>TRUST-IT</b>	R	EBOS	NVCR	M33

Del. Num.	Deliverable name	Lead	Type	Int. Rev/er #1	Int. Rev/er #2	Delivery date
<b>D6.4</b>	Dissemination and Communication Plan & Continuous monitoring (d-final)	<b>TRUST-IT</b>	R	ENG	CINECA	M36
<b>D6.5</b>	EO4EU Business Roadmap, Innovation and IPR Management Strategy & Sustainability pathway (a)	<b>TRUST-IT</b>	R	SIS	NVRC	M18
<b>D6.6</b>	EO4EU Business Roadmap, Innovation and IPR Management Strategy & Sustainability pathway (b-final)	<b>TRUST-IT</b>	R	NVRC	VU	M33
<b>D6.7</b>	Summary of Standardisation, Harmonisation & Awareness actions (a)	<b>NKUA</b>	R	ENG	CMCC	M18
<b>D6.8</b>	Summary of Standardisation, Harmonisation & Awareness actions (b-final)	<b>NKUA</b>	R	IVI	SIS	M33

**Table 1. Deliverable reviewers**

## 3.2 Quality Dashboard

### 3.2.1 Documents to support the quality process

For an efficient monitoring of the progress of some aspects of the project, an excel file (Quality Dashboard) has been created in which the salient information of the project is reported.

The Quality Dashboard contains a series of Worksheets (Effort, Leaders, Action Register and Risks Register etc.) which depict the current status of the various aspects of the project with the possibility of comparison with the objectives set and / or contractually agreed.

**The Excel Quality Dashboard file is available on SharePoint in the WP1\T1.3 folder.**

#### 3.2.1.1 Effort and Leaders

The following sheet shows the list of EO4EU WPs and tasks and reports the leader for each of them. In addition, the effort for WP is indicated for each partner. The total effort by WP and by partner in the project is also shown at the bottom of the rows and columns.

This sheet is intended for use primarily by the Project Coordinator and the Technical Director in order to assess whether the project resources are being used correctly.


Effort & Leaders																		
																		
WP	WP and Task descriptions	Leader	EO4EU- Total Effort per Partner															
			Effort (PM)															
			Per Partner															
			NKUA	EMCVF	NVRC	CINECA	VU	UL	FMI	CMCC	SIS	DANAOS	KEMEA	EBOS	TRUST-IT	COM MPA	ENG	IES
1	<b>Project Management &amp; Technical Coordination</b>	NKUA	35.0	14.0	2.0	3.0	4.0	0.0	1.0	1.0	1.0	2.0	5.0	14.0	4.0	0.0	8.0	6.0
	T1.1 Project management	NKUA																
	T1.2 Technical and Scientific coordination	ECMVF																
	T1.3 Risk management and Quality Assurance	ENG																
	T1.4 Legal Compliance and Ethical Assurance	NKUA																
2	<b>Requirements Elicitation and Conceptual Framework Specification</b>	EBOS	16.0	18.0	11.0	12.0	2.0	0.0	1.0	6.0	10.0	6.0	14.0	24.0	0.0	0.0	14.0	8.0
	T2.1 Multidisciplinary landscape analysis & Best of Breed Technologies	Sistema																
	T2.2 Multi Stakeholders Requirement Analysis and Business Process Modeling	ECMVF																
	T2.3 Technical Specifications, Interoperability Requirements and Scalability analysis	NKUA																
3	<b>Data Orchestration &amp; Machine Learning</b>	ECMVF	60.0	16.0	47.0	42.0	2.0	0.0	0.0	4.0	10.0	6.0	0.0	27.0	0.0	0.0	45.0	8.0
	T3.1 Knowledge Graph and Semantic Annotation for Data Mapping	NVRC																
	T3.2 Systems and Services Orchestration	NKUA																
	T3.3 ML-based processing	HES-SO																
	T3.4 Customer facing services	EBOS																
4	<b>EO4EU Data Marketplace Ecosystem</b>	CINECA	30.0	18.0	11.0	78.0	0.0	0.0	0.0	0.0	14.0	8.0	3.0	16.0	0.0	0.0	18.0	11.0
	T4.1 Integration planning & Service provision Specification	EBOS																
	T4.2 Data Store and Staging deployment and configuration	CINECA																
	T4.3 Continuous Integration/Continuous Delivery	ENG																
5	<b>EO Data Usage Demonstration</b>	CMCC	15.0	11.0	4.5	0.0	28.0	10.0	24.0	63.0	18.0	15.0	23.0	6.0	7.0	0.0	8.0	36.0
	T5.1 Use cases Definition & Technical alignment	SISTEMA																
	T5.2 Use Cases Library - Planning - Review - Assessment	CMCC																

Figure 3. Effort and Leaders worksheet

### 3.2.1.2 Deliverables and Reviewers

The “Deliverables & Reviewers” worksheet contains all the deliverables envisaged in EO4EU. The file provides a complete view of deliverables, from preparing the results for internal review to submission (Figure 3). Through this sheet it is possible to group the deliverables according to the criteria deemed most useful or appropriate by those who use them.


Deliverables & Reviewers																		
																		
Work Package	Deliverable	Deliverable Name	Description	Type	Dissemination Level	Lead Beneficiary	Due Date	New Due Date (if delay)	Internal Reviewer #1	Internal Reviewer #2	Approval Reviewer (MST)	Delivery Date	Approval Date	Status				
WP1	D1.1	Project management manual	A project handbook	R	PU	ECMVF	31 Aug 2022		NVRC	IES		31 Aug 2022		Submitted				
WP1	D1.2	Not management plan	A quality and risk management plan	R	PU	ENG	30 Nov 2022		CMCC					Pending				
WP1	D1.3	Data management plan (a)	A data management plan	R	PU	NVRC	29 Nov 2022		ECMVF	DANAOS				Pending				
WP1	D1.4	Data management plan (b)	A data management plan	R	PU	NVRC	29 Nov 2022		NKUA	ENG				Pending				
WP1	D1.5	Data management plan (c-final)	A data management plan	R	PU	NVRC	24 Feb 2023		CINECA	HES-SO				Pending				
WP1	D1.6	Annual progress reports (a)	Annual progress reports	R	PU	NKUA	31 May 2023		VU	IES				Pending				
WP1	D1.7	Annual progress reports (b)	Annual progress reports	R	PU	NKUA	31 May 2024		CMCC	LU				Pending				
WP1	D1.8	Annual progress reports (c)	Annual progress reports	R	PU	NKUA	31 May 2025		SIS	TRUST-IT				Pending				
WP1	D1.9	Annual progress reports (d-final)	Final annual progress reports	R	PU	NKUA	31 May 2025		KEMEA	NVRC				Pending				
WP1	D1.10	Legal and Ethical Issues and Guidelines (a)	A legal and ethical issues and guidelines	R	PU	NKUA	31 May 2023		EBOS	FMI				Pending				
WP1	D1.11	Legal and Ethical Issues and Guidelines (b-final)	A legal and ethical issues and guidelines	R	PU	NKUA	31 Jun 2024		TRUST-IT	KEMEA				Pending				
WP2	D2.1	Research and Innovation Landscape analysis report	The deliverable will be	R	PU	SIS	23 Feb 2023		NKUA	HES-SO				Pending				
WP2	D2.2	EO4EU End-user Requirements Analysis & Business process flow (a)	This deliverable describes	R	PU	ECMVF	30 Nov 2022		LU	HES-SO				Pending				
WP2	D2.3	EO4EU End-user Requirements Analysis & Business process flow (b-final)	This deliverable describes	R	PU	ECMVF	31 May 2024		FMI	NVRC				Pending				
WP2	D2.4	Technical, Operational and Interoperability specifications and Architecture	This deliverable describes	R	PU	NKUA	30 Nov 2022		SIS	CINECA				Pending				
WP2	D2.1	Knowledge Graph Configuration Manual & Deployment	This deliverable describes	R	PU	NVRC	29 Nov 2022		ECMVF	IVI				Pending				
WP3	D3.2	EO4EU automatic deployment and reviewer (a)	Report describing the	OTHER	PU	NKUA	29 Nov 2022		MEDO	LU				Pending				
WP3	D3.3	EO4EU automatic deployment and reviewer (b-final)	Report describing the	OTHER	PU	NKUA	31 May 2023		CINECA	IES				Pending				
WP3	D3.4	ML methods, models, and documentation	This deliverable describes	R	PU	HES-SO	30 Nov 2022		EBOS	SIS				Pending				
WP3	D3.5	Customer facing services for users information uptake (a)	This deliverable describes	R	PU	EBOS	30 Nov 2022		VU	TRUST-IT				Pending				
WP3	D3.6	Customer facing services for users information uptake (b-final)	This deliverable describes	R	PU	EBOS	30 Nov 2024		CMCC	NKUA				Pending				
WP4	D4.1	Infrastructure & Services Definition (a)	This deliverable describes	R	PU	EBOS	29 Nov 2022		LU	ECMVF				Pending				
WP4	D4.2	Infrastructure & Services Definition (b-final)	This deliverable describes	R	PU	EBOS	31 May 2024		CINECA	NKUA				Pending				
WP4	D4.3	Cloud infrastructure deployment and configuration report (a)	This deliverable describes	R	SEN	CINECA	30 Nov 2022		KEMEA	FMI				Pending				
WP4	D4.4	Cloud infrastructure deployment and configuration report (b-final)	This deliverable describes	R	SEN	CINECA	30 Sep 2024		EBOS	NKUA				Pending				
WP4	D4.5	Release of Services-Infrastructure Configuration management or services (a)	Report of the deployment	OTHER	PU	NKUA	30 Nov 2022		TRUST-IT	VU				Pending				
WP4	D4.6	Release of Services-Infrastructure Configuration management or services (b-final)	Report of the deployment	OTHER	PU	NKUA	30 Nov 2024		NVRC	MEDO				Pending				

Figure 4. Deliverables and Reviewers worksheet

### 3.2.1.3 Key Performance Indicators (KPIs) Worksheet

EO4EU aims to achieve 7 objectives already described in the GA. During the proposal phase, the KPIs useful for evaluating these objectives were also marked. The table below shows the list of KPIs associated with each project objective.


Objective	KPI ID	Name	Target Value
<b>01: To design and deploy a holistic Data Operation (DataOps) ecosystem to enhance access and usability of environmental observation information.</b>	<b>KPI#1.1</b>	User satisfaction of the data aggregation;	<b>&gt;85%</b>

Objective	KPI ID	Name	Target Value
	<b>KPI#1.2</b>	Quality of Service;	<b>&gt;95%</b>
<b>02: To deploy a semantic-enhanced knowledge graph that augments the FAIRness of EO data knowledge and supports a sophisticated representation of data entities and their dynamics</b>	<b>KPI#2.1</b>	Classification accuracy;	<b>&gt;87%</b>
	<b>KPI#2.2</b>	datasets;	<b>&gt;1PB</b>
	<b>KPI#2.3</b>	relation assertion errors;	<b>&lt;12%</b>
<b>03: To advance stakeholders' knowledge capacity through informed decision making and policy making support.</b>	<b>KPI#3.1</b>	Task success rate;	<b>&gt;90%</b>
	<b>KPI#3.2</b>	Task Completion time;	<b>&lt;90s</b>
	<b>KPI#3.3</b>	System Usability Scale (SUS);	<b>&gt;8</b>
<b>04: To design and deploy a machine learning pipeline that enables the dynamic annotation of the various environmental observation data sources.</b>	<b>KPI#4.1</b>	Reduction of the labeling effort for downstream supervised activities while preserving predictive performance;	<b>90%</b>
	<b>KPI#4.2</b>	Reduction data sizes (Bits Per Pixel, BPP) using learned visual quality (MSE). Compression compared to JPEG2000, for the same visual quality (MSE);	<b>60%</b>
<b>05: To implement and validate EO4EU in a full range of use case scenarios addressing current data needs, capitalizing existing digital services and platforms, fostering their usability and practicality, taking into account ethical aspects aiming to social impact maximization.</b>	<b>KPI#5.1</b>	End-user satisfaction from system operation;	<b>&gt;95%</b>
	<b>KPI#5.2</b>	System response time (in msec) for exchanging data between modules;	<b>&lt;500msec</b>
	<b>KPI#5.3</b>	Number of use-case scenarios supported by the prototype implementation.	<b>&gt;5</b>
<b>06: To deploy efficient, reliable and interoperable inter- and intra- layer communications.</b>	<b>KPI#6.1</b>	Inter-process communication latency reduction;	<b>&gt;20%</b>
	<b>KPI#6.2</b>	Improved completion time;	<b>&gt;40%</b>
	<b>KPI#6.3</b>	Software robustness;	<b>&gt;90%</b>
	<b>KPI#6.4</b>	Software parallelism;	<b>&gt;95%</b>

Objective	KPI ID	Name	Target Value
<b>07: Wide communication, scientific dissemination and vertical exploitation of scientific results &amp; outputs.</b>	<b>KPI#7.1</b>	Number of synergies with external initiatives;	<b>&gt;5</b>
	<b>KPI#7.2</b>	Number of publications;	<b>&gt;30</b>

**Table 2. Objectives and KPIs**

The KPIs worksheet is available for monitoring all project KPIs. This worksheet allows monitoring the value of KPIs throughout the life cycle of the project. The KPI worksheet currently incorporates the following information: KPI ID, KPI name, description, target value, current value, responsible beneficiary (partner), and comments. The current Value of each KPI will be updated as far as concerns progresses are done on KPIs.

Objectives and KPIs						
						
KPI ID	Name	Description	Target Value	Current Value	Responsible Partner	Comments
<b>01: To design and deploy an holistic Data Operation (DataOps) ecosystem to enhance access and usability of environmental observation</b>						
KPI#1.1	User satisfaction of the data aggregation;		>85%			
KPI#1.2	Quality of Service;		>95%			
<b>02: To deploy a semantic-enhanced knowledge graph that augments the FAIRness of EO data knowledge and supports a sophisticated</b>						
KPI#2.1	Classification accuracy;		>87%			
KPI#2.2	datasets;		>1PB			
KPI#2.3	relation assertion errors;		<12%			
<b>03: To advance stakeholders' knowledge capacity through informed decision making and policy making support.</b>						
KPI#3.1	Task success rate;		>90%			
KPI#3.2	Task Completion time;		<90s			
KPI#3.3	System Usability Scale (SUS);		>8			
<b>04: To design and deploy a machine learning pipeline that enables the dynamic annotation of the various environmental observation data</b>						
KPI#4.1	Reduction of the labeling effort for downstream supervised activities while preserving predictive performance;		90%			
KPI#4.2	Reduction data sizes (Bits Per Pixel, BPP) using learned visual quality (MSE). Compression compared to JPEG2000, for the same visual quality (MSE);		60%			
<b>05: To implement and validate EO4EU in a full range of use case scenarios addressing current data needs, capitalizing existing digital</b>						

**Figure 5. Objective and KPIs worksheet**

### 3.2.1.4 Action Points Register

In addition to the sheets contained in the Quality Dashboard, useful to monitoring some important characteristics of the project, for the benefit of a high level of Quality management, the Action Register file has been created. At the end of each meeting or telco, the organizer produces a minute of the meeting (MoM) containing the meeting agenda, the participants list and the list of actions agreed. The idea of an Action Register arises from the need to have a complete picture of all the project Action Points and to be able to monitor their processing status.

The Action register file shared with all project participants and can be consulted and edited by everyone. The Action Register contains: a description of the Action Point, the Owner (the action holder), the Place where the Action has been identified, any deadline and status [Open, Closed, Ongoing].

Action Register								
EO4EU								
Categories (WP, Task, Activity)	Action N°	Description of the Action Point (Each partner is responsible to add any action deemed necessary and include from which Partner(s) or organization a contribution or input is needed)	Owner (The responsible Partner to accommodate the Action)	Place where the Action has been identified (e.g. WP Telco, technical meeting, end-users meeting, etc.)	Date when the Action has been identified	Deadline (when the Action should be accommodated/ completed)	Refer to a potential related Risk from the Risk Register file if a	Current status of the Action (Open, Closed, in progress)
WP6	AP#1	Indicate what activities you would like to contribute to in this sheet (WP6 Members): EO4EU WP6 Management. If you have other activities you think could be useful but are not listed, feel free to add a new column with the activity.	All WP6 Members	Monthly Meeting - 14 July 2022				
WP6	AP#2	In the sheet (WP6 Members): EO4EU WP6 Management, add any activities you would like to source contributors for	WP6 Task leaders	Monthly Meeting - 14 July 2022				
Introductory Webinar	AP#4	Provide link for presentations to the presenters: <a href="https://drive.google.com/drive/folders/1Qmoag1TEldZ7teZl8KtUK55YqNek65R">https://drive.google.com/drive/folders/1Qmoag1TEldZ7teZl8KtUK55YqNek65R</a>	Rob Carrillo	Monthly Meeting - 14 July 2022				DONE
WP6	AP#5		Rob Carrillo	Monthly Meeting - 14 July 2022				DONE

Figure 6. Action Register worksheet

## 4 Risk Management and Mitigation Plan

### 4.1 Risk Management Process

In terms of risk management, T1.3 captures all potential risks in the early stages of the project for each WP in both management and technical terms, providing a comprehensive risk management plan. The risk management and mitigation plan aim to identify potential risks that may affect or threaten the success of the project and to plan mitigation measures in order to avoid or minimize the impact of unforeseen developments throughout the life of the project. Drawing up a list of potential risks allows planning and preparing in advance the actions to undertake in case the risk materializes. All partners are required to identify the potential risks inherent to their activities, thus allowing tackling risks by targeted and effective preventive actions.

#### 4.1.1 Risk management tools and procedures

##### 4.1.1.1 Risk register

The Risk Register worksheet reports all the risks for the project already identified in the proposal phase. The afore mentioned sheet, however, has the dual purpose of: tracing the detection, monitoring the possible mitigation of further risks that may arise or predict during the life cycle of the project. In fact, the sheet shows the columns suitable for hosting new risks identified, the date on which this risk is detected, the WPs on which it could impact and the mitigation actions to reach or mitigate the risk itself.




Risk Register										
										
Risk number	Risk opening date	Risk creator	WP(s) involved	Risk type	Risk description	Risk status	Likelihood	Expected impact	Possible solution/way to prevent	Remarks (including reference to eventual relevant action items)
R1	Proposal stage	Consortium	WP2, WP5	Technical	Use cases do not highlight the EO4EU contribution.	Identified	LOW	HIGH	End users will be actively involved in all the phases of the project through our pilot partners, and will provide feedback regarding their requirements. The thorough analysis of each use case will be in accordance with the latest technological developments and market trends.	
R2	Proposal stage	Consortium	WP5, WP3, WP4	Technical	Higher complexity of ICT development than expected leads to higher consumption of technical resources	Identified	MEDIUM		This risk is minimised by the fact that EO4EU builds upon existing technologies, brought in by the consortium partners, already at high TRL. Moreover, technical expertise is adequate in the project consortium to provide if the need arises.	
R3	Proposal stage	Consortium	WP4, WP6	Technical	User Interfaces are too complex for end-users.	Identified	LOW		Representatives of end-users will participate at the user requirements analysis phase and provide design feedback for the individual module's front-end architecture to ensure that the interfaces are user-friendly and capture their needs, with specific emphasis on marginalized and vulnerable groups of the population. Moreover, minor modifications can also be applied after validating the modules in the field.	
R4	Proposal stage	Consortium	WP5	Technical	Difficulty to complete the integration process.	Identified	MEDIUM		EO4EU adopts an agile development approach with a continuous and iterative integration methodology that will clearly define the requirements as well as the measures to avoid any possible obstacles, inconsistencies and technical turnovers from the early stages.	
R5	Proposal stage	Consortium	WP5, WP3, WP4	Technical	Expected TRL level is not accomplished.	Identified	LOW		The individual components along with the EO4EU integrated framework aim to reach TRL 6-7. Technical risks might prevent us from meeting this TRL level. Our iterative agile development methodology will help in early identification of such risks and adapt accordingly to mitigate this risk.	
									The TC will be responsible for the evaluation of the quality of the outcomes, in accordance with the quality produced and agreed	

Figure 7. Risk Register worksheet

The columns of the table show the identifying and descriptive elements of the risks as follows:

- Risk number: it is a unique identifier.
- Risk opening date is the date on which the risk was identified. The risks already identified in the proposal phase do not bear the date, but the words "Proposal stage".
- Risk creator: reports the role of those who identified the risk (consortium, WP leader, Task leader, PC, TM,...).
- WP (s) involved: reports the WP (s) that are impacted by the risk.
- Risk type: indicates the type of risk (Technical or Management).
- Description: provides an adequate description of the risk.
- Risk status: indicates the status of the risk (Identified, manifested, mitigated).
- Possible solution: represents the possible mitigation action.
- Remarks: any notes or actions performed.
- Likelihood and Expected impact: these two columns refer to the Risk Severity Matrix which gives indications on how likely the risk is to occur and how serious the impact on the project is.

The Risk Register worksheet is contained in the Excel Quality Dashboard file described in [3.2](#)

		Likelihood		
		Low	Medium	High
Impact	Low	Low	Low	Medium
	Medium	Low	Medium	High
	High	Medium	High	High

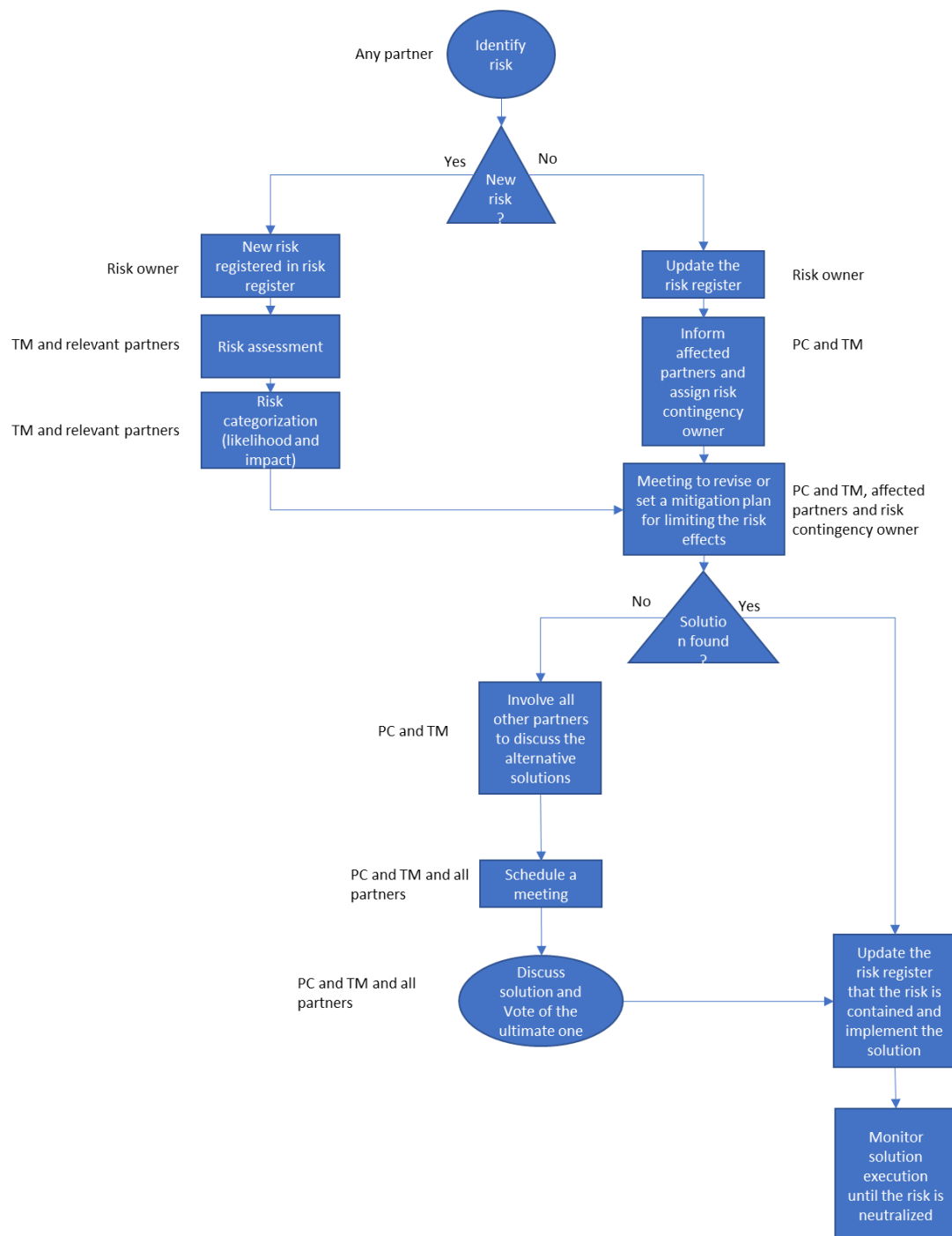
Figure 8. Risk Severity Matrix

#### 4.1.1.2 Risk status monitoring



The identification of new risks and the monitoring of those already identified will be carried out every two months in correspondence with the Telco of WP1. All updates will be reported in the Risk Register described above.

The figure below shows the risk management procedure adopted in EO4EU. The procedure ensures that there is no redundancy in the cataloguing of risks. Moreover, this procedure ensures that each identified risk is shared with all the involved partners and that mitigation actions are agreed in order to neutralize the risk itself. Each risk is constantly monitored until it is neutralized.



**Figure 9. Risk Management Procedure**

The following table shows the potential risks already identified during the proposal stage in EO4EU project.

<b>Risk</b>	<b>Description of risk</b>	<b>WP</b>	<b>Proposed risk-mitigation measures</b>
<b>R1</b>	<b>Use cases do not highlight the EO4EU contribution.</b>	WP2, WP5	End users will be actively involved in all the phases of the project through our pilot partners and will provide feedback regarding their requirements. The thorough analysis of each use case will be in accordance with the latest technological developments and market trends.
<b>R2</b>	<b>Higher than expected ICT development complexity leads to higher consumption of technical resources</b>	WP5, WP3, WP4	This risk is minimised by the fact that EO4EU builds upon existing technologies, brought in by the consortium partners, already at high TRL. Moreover, technical expertise is adequate in the project consortium to provide if the need arises.
<b>R3</b>	<b>User Interfaces are too complex for end-users.</b>	WP4, WP6	Representatives of end-users will participate at the user requirements analysis phase and provide design feedback for the individual module's front-end architecture to ensure that the interfaces are user-friendly and capture their needs, with specific emphasis on marginalized and vulnerable groups of the population. Moreover, minor modifications can also be applied after validating the modules in the field.
<b>R4</b>	<b>Difficulty to complete the integration process.</b>	WP5	EO4EU adopts an agile development approach with a continuous and iterative integration methodology that will clearly define the requirements as well as the measures to avoid any possible obstacles, inconsistencies and technical turnovers from the early stages.
<b>R5</b>	<b>Expected TRL level is not accomplished.</b>	WP5, WP3, WP4	The individual components along with the EO4EU integrated framework aim to reach TRL 6-7. Technical risks might prevent us from meeting this TRL level. Our iterative agile development methodology will help in early identification of such risks and adapt accordingly to mitigate this risk.
<b>R6</b>	<b>Technical results are of insufficient quality and/or poorly validated</b>	WP5, WP3, WP4	The TC will be responsible for the evaluation of the quality of the outcomes, in accordance with the quality produced and agreed upon. Continuous monitoring and intermediate reports, alongside the active involvement of beneficiaries will allow us to identify any critical points.  A continuous collaboration among WP2-WP5 will be set to preserve the quality of results. This will also include a complete agile toolkit provided to partners to maximize the number of quality checks and avoid regressions.
<b>R7</b>	<b>Lack of appropriate cooperation and communication.</b>	WP1	The detailed description of the roles and responsibilities of each partner will be described in the CA and will be constantly reviewed by the PC, as described in WP1. The main means for information exchange will be working papers, project meetings, workshops, telephone conferences, e-mail, project website, etc. Furthermore, the established collaboration of the partners of EO4U in similar EU projects ensures their smooth and effective collaboration.
<b>R8</b>	<b>A critical partner leaves at an important point of the project.</b>	WP1	EO4EU's multidimensional consortium expertise will make sure that the project's success is not endangered for the duration of processes relating to attracting new competent partners.

Risk	Description of risk	WP	Proposed risk-mitigation measures
R9	Conflicts of IPR Ownership.	WP1	The CA guarantees the protection of IPR. The contribution of each partner to the outcomes will be evaluated by the PC and the IM in accordance with the IPR definition.
R10	Overestimated/ Underestimated workload.	WP1	EO4EU' work plan is carefully designed by all partners to ensure the efficient allocation of the P/Ms per WP and their tasks. However, P/Ms can be readjusted to meet the requirements of each WP.
R11	Failure to exploit market opportunities and insufficient adoption by beneficiaries outside the consortium.	WP5	The consortium includes experienced professionals in promoting technological solutions in the market who can modify the after the first prototype, the EO4EU solution that will be adjusted to the market. Coordinated exploitation is dealt with in WP5.
R12	COVID-19 related risks	WP2, WP5, WP3, WP4, WP1, WP6	The team considers most interactions, meetings and decision-making done remotely. Further virtualisation of meetings, re-allocating the resource saved from travel and subsistence (e.g., creating a series of webinars), will be a mitigation measure.
R13	Ethical, Legal Risks	WP1	EO4EU takes into consideration all legal and ethical aspects (T1.4 Legal Compliance and Ethical Assurance), both at a national and EU level, towards meeting data confidentiality, locality and data protection, any potential restrictions in data usage and sharing across countries as well as the national/ European regulations that hinder innovation. EO4EU aims to fully comply with GDPR and all associated European (and national) policies related to data protection, and safeguard that all relevant requirements will be properly and timely gathered, processed and addressed.
R14	Poor exploitation and commercialization	WP6	EO4EU dedicates resources in the development of targeted exploitation and commercialization strategy (T6.3 Exploitable Market Potentials, Sustainability Strategy and Upscaling). The consortium will implement and scale innovations and invest for improved IT infrastructures, by designing solid business models, extracting exploitable assets and structuring a dedicated sustainability strategy. T6.1 Stakeholder Engagement and dissemination planning, Implementation and (Monitoring) & T6.2 Onboarding of end-users & uptake monitoring will focus on expanding the adoption of the EO4EU system, maximising the engagement of the various stakeholders that include private sector and citizen representatives, by using GDPR and FAIR compliant methodologies. By these means, all types of stakeholders will be actively engaged in the specification, design, evaluation and refinement of the foreseen tools and integrated solution to ensure that our solution is aligned with the needs of its end-users while also enabling early exploitation, dissemination and ensuring the sustainability of our project.

Risk	Description of risk	WP	Proposed risk-mitigation measures
<b>R15</b>	Models developed are inaccurate	WP2	<p>Models and reference architecture will be documented in T2.3 Technical Specifications, interoperability Requirements and Scalability analysis. All such matters will be thoroughly analyzed in D2.3 - Technical Requirements and Reference Architecture, while potential risks will be addressed and recorded in D1.2 - Risk management plan. Furthermore, EO4EU will provide the computing network and will be aligned with all interoperability standards to integrate with existing ageing and outdated legacy equipment. To address any limitation</p> <p>in access to Big and Open Linked Data, EO4EU will timely gain access to available open data while encryption and anonymization approaches will be adopted to ensure privacy and security and safeguard the exploitability of our solution.</p>

**Table 3. Risks at proposal stage**

## 5 Annex A: Quality Review Report

The EO4EU Consortium uses the Quality Review Report process for its internal quality assurance for deliverables to assure consistency and high standard for documented project results.

The Quality Review Report is used individually by selected peer reviewers. The allocated time for the review is 7 calendar days. The author of the document has the final responsibility to reply on the comments and suggestions of the peer reviewers and decide what changes are needed to the document and what actions are to be undertaken.

### 5.1 Reviewers

Project Coordinator	
Task Leader	ENG
Internal Peer Reviewer	Laura Conte (CMCC), Monia Santini (CMCC), Marco Mancini (CMCC), Fabrizio Ferrucci (IES), Thomas Azrak (EBOS)

### 5.2 Overall Peer Review Result

The Deliverable is:

- ☐ Fully accepted  
☒ Accepted with minor corrections, as suggested by the reviewers  
☐ **Rejected** unless major corrections are applied, as suggested by the reviewers

### 5.3 Consolidated Comments of Quality Reviewers

Topic	Answer	IF "No", classify as "Major" or "Minor" issues	Comments
Are content and structure of the deliverable in accordance with the DoA?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
Is the content of the deliverable scientifically relevant?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A		
Is the content of the deliverable useful for the subsequent work on the project?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
Is the deliverable suitable to be submitted to the EC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
If not: <b>To be submitted after major amendments indicated/suggested</b>			

Topic	Answer	IF "No", classify as "Major" or "Minor" issues	Comments
Does it need formatting adjustments?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		A few edits required as suggested in track changes
Does it need content adjustments?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		<p>Main issue is related to the Risk Management Table as there is no correspondence between risk and proposed risk-mitigation measures. We suggested re-alignment in track changes based on the GA.</p> <p>A minor issue is to fix the 1<sup>st</sup> reviewer of D5.8 in Table 1, as for now KEMEA is indicated but it is also the Del. Responsible.</p>
Does it need to be significantly refined (e.g. content improvement, structure changes, etc.)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
<b>Additional comments</b>			