



Final Innovation Management and Exploitation Plan

iMagine Deliverable D2.9

30/09/2025

Abstract

This deliverable provides a final overview of the activities carried out by the Innovation and Exploitation team, following the strategy outlined in D2.2 – First Innovation Management and Exploitation Plan, submitted in February 2023. The actions described herein were implemented by the Task 2.1 members throughout the project.



**Funded by
the European Union**

iMagine receives funding from the European Union's Horizon Europe research & innovation programme under grant agreement No. 101058625.

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Document Description

D2.9 Final Innovation and Exploitation Management Plan			
WP2			
Due date	31/08/2025	Actual delivery date:	30/09/2025
Nature of document	Report	Version	1.0
Dissemination level	Public		
Lead Partner	EGI		
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Public link	https://zenodo.org/records/17235334		
Keywords	Innovation, Exploitation, Stakeholder, Engagement, Key Exploitable Results, IPR, Intellectual Property, Business Model, Sustainability		

Revision History

Issue	Item	Comments	Author/Reviewer
V O.1	Draft version	Early draft	Smitesh Jain
V O.2	Edit	Contributed Blue-Cloud synergy option	Dick M.A. Schaap
V 1.0	Final Version		

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Introduction

iImagine has the overall objective to deploy, operate, validate, and promote a dedicated iImagine AI framework and platform. The platform, connected to the EOSC and AI4EU, provides researchers in aquatic sciences with open access to a diverse portfolio of AI-based image analysis services and image repositories from multiple RIs. These services and repositories are relevant to the overarching theme of 'Healthy oceans, seas, coastal and inland waters.

The project concept revolves around three main working blocks:

- A common **iImagine AI framework and computing platform** have been configured facilitating researchers in developing, testing, training, hosting, and operating AI-based image analysis services, following FAIR practices.
- **Five operational and three prototype AI-based image analysis services** with image repositories have been developed and deployed at the iImagine AI platform to provide open access and exploitation by researchers. They will also be instrumental in demonstrating value and fostering further uptake by a large community of target users and beneficiaries.
- **Best Practices** – consisting of documentation and training materials – have been compiled giving practical guidance and examples to end-users on exploiting image datasets and analysis applications offered by the iImagine portfolio and serving as an example to whoever wishes to develop and deliver similar AI-based image analysis services and image repositories.

The activities related to the Innovation and Exploitation Management in the iImagine project fall under task 2.1 with the main objectives to:

1. Implement and conduct an operational innovation management process.
2. Capture and assess project results for exploitation readiness.
3. Identify and articulate the Key Exploitable Results (KERs).
4. Organise hands-on workshops (for example, business models) that will support innovation management and exploitation activities.
5. Monitor changing market landscapes, responding to feedback and the potential for new business opportunities.
6. Provide facilitation in project events and meetings (for example, brainstorming sessions).

Purpose and Scope of the document

This deliverable presents the Final Innovation Management & Exploitation Plan for the iImagine project, consolidating the approaches to managing innovation and exploiting project results after 36 months of activities. The document recaps how KERs, the project's main outputs with high potential for downstream use, have been identified, protected

(where relevant), and prepared for uptake beyond the project's lifetime. All iImagine results are released as open-source components, which have guided an exploitation strategy centred on broad adoption, community sustainability, and integration into European e-infrastructures. The plan outlines exploitation routes for each KER, intellectual property and licensing considerations, roles of consortium partners in exploitation, and the post-project sustainability model.

The primary objective of this deliverable is to detail how each Key Exploitable Result (KER) of iImagine will be taken forward. Exploitation in the context of EU research refers to making use of results to create impact, whether through scientific reuse, new products/services, standards, or policy input. Given that all iImagine outputs are open-source, our exploitation approach emphasises broad dissemination, community uptake, and integration with existing platforms over proprietary commercialisation. Specific goals include: (a) describing each KER and its exploitation pathway (who will use it, how, and under what model), (b) clarifying Intellectual Property Rights (IPR) and licensing for each result, (c) assigning roles and commitments of partners in post-project exploitation, and (d) defining the sustainability plan (resources and arrangements to maintain results). We also document the innovation management process employed during the project – how we monitored and guided the maturation of results – and reflect on lessons learned to inform future projects.

Structure of the document

This document is structured as follows:

1. **Innovation and Exploitation Activities** provide an overview of the Innovation and Exploitation Management approach of the iImagine Project.
2. The section on **Key Exploitable Results** provides an update on the KERs with short snapshots of the results.
3. The **Project Results, IP and Licensing strategy** covers the IP strategy of the project and also provides the detailed IP list of the project.
4. This is followed by a detailed discussion on the Exploitation Strategy (during and after the project).
5. The section on **Impact Analysis** introduces the methodology used for analysing the Impact of the project while linking to the detailed report on Zenodo.
6. Finally, the section on **Sustainability** discusses the various mechanisms through which the sustainability of the iImagine results is achieved.

Innovation and Exploitation Activities

Effective exploitation begins with solid innovation management during the project. In iImagine, innovation management was a continuous process ensuring that promising outputs (tools, services, methods) were identified early, their development aligned with user needs, and their future use beyond the project was facilitated. The innovation and Exploitation Management approach of the iImagine project derives loosely from the Technology Management Process¹ and ISO 56002:2019 Innovation management — Innovation management system — Guidance². Innovation and Exploitation management in iImagine covers the following aspects:

- Stakeholder Analysis
- KER Management
- Project Result Management
- Intellectual Property Management
- Business Modelling and Sustainability Analysis
- Exploitation Strategy
- Impact Analysis

Governance and Responsibilities

Work Package 2 (WP2) was dedicated to innovation, exploitation and communication, with the WP2 leader acting as the Innovation Manager, working closely with the Project Coordinator, Communication Manager and all WP leaders. An Innovation Exploitation Group was established, consisting of KER ambassadors responsible for major results. The role of this group was to support the documentation of the results, develop and manage the KER templates, and advise on exploitation strategy. A close collaboration was maintained with the Dissemination & Communication task to coordinate outreach for exploitation.

Key Exploitable Results

A KER is defined as “a main project result, selected and prioritised for its high potential to be exploited. An early set of KERs was already identified during the project proposal phase. After discussion with the project Activity and Service Board (ASB), this list was revised to better reflect the outcomes of the project. At this stage, 8 KERs were identified. This list has since remained unchanged. The KERs are as follows,

¹ Gregory, M.J. (1995), “Technology management: a process approach”, Proceedings of the Institution of Mechanical Engineers, Vol. 209, pp. 347–56.
https://doi.org/10.1243/PIME_PROC_1995_209_094_02

² <https://www.iso.org/standard/68221.html>

1. KER#1–#5 represents the 5 mature AI-powered thematic services designed for specific image analysis scientific use cases.
2. KER#6 covers the 3 AI-powered, prototype level thematic services designed for specific image analysis scientific use cases.
3. KER#7 is related to the iMagine AI platform for facilitating transparent AI model training, sharing, serving, and publication. And finally,
4. KER#8 compiles the Best Practices covering approaches for adopting AI and setting up AI image processing workflows among others drawing from the experiences of use case development.

For each of the identified KERs, the ASB identified a KER Ambassador. The role of the KER Ambassador was to support the Innovation Manager in documenting the information related to KER in the Horizon Results Platform (HRP). This is an extensive template covering aspects like Result Information, Stakeholders and Users, Target Audience and Needs, Result Maturity and Exploitation Outlook, Business Model and Sustainability, Auxiliary Contributions and Other Information. These templates were updated periodically. A snapshot of these templates for each of the KER is showcased below, along with the link to the entry on HRP.

Table 1 Project KERs and Horizon Results Platform Entry Links

KER#1 Marine Litter Assessment	
Result Description (1200 characters)	<p>About: The Aquatic Litter Monitoring system uses RGB images and composites from Unmanned Aerial Systems (UAS; drones) cameras along with Convolutional neural networks (CNN) for precise litter quantification and characterisation. The system ingests, stores, analyses and processes litter floating at surface waters in seas, rivers and lakes, and lying at beaches and shores, and eventually delivers standardised classified litter data sets, which are fit for environmental management and indicators. With fine-tuned processing methodology, quality-checked training dataset of litter and the adoption of standardised protocols, the system is operational in the iMagine AI platform, providing valuable analysis to local stakeholders and clean-up operations in multiple countries. Comprehensive guidance and training materials are also available to facilitate the adoption of drone-based litter observation and image processing.</p> <p>Impact: Resulting litter data sets are important for environmental management, cleaning operations, and contributing to indicators such as the EU Marine Strategy Framework Directive (MSFD), the EU Water Framework Directive (WFD) and the EU Green Deal.</p>

Result Type	Services
Key Value Proposition	<ol style="list-style-type: none"> 1. Aquatic Litter Monitoring system offers precise, AI-driven analysis for accurate assessment of aquatic litter, enabling targeted pollution control. 2. By automating image processing, the Aquatic Litter Monitoring system ensures consistent, standardised litter datasets, empowering efficient decision-making and environmental action. 3. Aquatic Litter Monitoring system's user-friendly approach extends to citizen scientists, fostering widespread involvement and awareness for a cleaner aquatic environment.
Link to the HRP Entry	https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/horizon-results-platform/87960
KER#2 ZooProcess	
Result Description (1200 characters)	<p>About: The new ZooProcess v10 accelerates the processing of images of plankton samples produced by the ZooScan instrument through the combined use of classical image segmentation and measurement methods with panoptic segmentation by neural network models. The use of this Artificial Intelligence approach allows for the automatic separation of touching objects to enable their exploitation in further steps. This new pipeline supersedes the current versions of the ZooProcess software. It efficiently handles metadata recording, image acquisition from the scanner, image processing, segmentation, feature extraction and data formatting. The resulting data is imported and managed into EcoTaxa, a web application coupling a database with AI tools to accelerate the labelling of large quantities of plankton images by human operators, who are trained biologists. The operational environment provided by the iMagine AI platform, as well as dedicated training material and support, will promote further uptake of this new pipeline to enhance research efficiency.</p> <p>Impact: Plankton indicators are used within several descriptors of the MSFD and WFD. The output of this pipeline will contribute to a better understanding of the dynamics of food availability for commercially exploited species and of the effects of climate change.</p>

Result Type	Services
Key Value Proposition	<ol style="list-style-type: none"> 1. Handle water sample images and all the associated metadata through this new pipeline. 2. The use of instance segmentation in ZooProcess10 will allow a better coverage of the different taxonomic groups present in a sample. 3. The acceleration of the data flow through ZooProcess10 and EcoTaxa can provide faster information from plankton samples.
Link to the HRP Entry	https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/horizon-results-platform/87765
KER#3 Marine Ecosystem Monitoring	
Result Description (1200 characters)	<p>About: The European Multidisciplinary Seafloor and Water Column Observatory (EMSO) aims to explore the oceans, better understand the phenomena happening within and below them, and explain the critical role that these phenomena play in the broader Earth systems. Several of the EMSO sites capture underwater videos. The Marine Ecosystem Monitoring system has developed standards for managing and storing video imagery, and annotated images have been developed. The EMSO workflow has been set up in the iMagine-AI platform using Artificial Intelligence (AI) for the preselection of interesting images and AI analysis of selected images for the identification of biota. Documentation and guidance about standard data management practices and for using the AI analysis pipelines for biota classification have also been developed.</p> <p>Impact: Essential Ocean Variables (EOVs) available from the EMSO sites, along with the annotated imagery, will contribute towards biodiversity and ecosystem studies.</p>
Result Type	Services
Key Value Proposition	<ol style="list-style-type: none"> 1. Marine ecosystem monitoring provides underwater videos and leverages AI for biota identification, paving the way for groundbreaking insights into oceanic phenomena and biodiversity. 2. EMSO – OBSEA has a 10-year dataset of annotated images with information about the number and type of species that

	<p>appear on each photo. EMSO-Smartbay has footage archives dating back to 2017. Also, data from additional sensors, including the measurement of environmental parameters (temperature, salinity, dissolved oxygen, turbidity), current flow and sound. EMSO-Azores has an 11-year video archive from which extracted images have been annotated either by experts or by citizens through the DeepSeaSpy platform. Also, data from additional sensors provide the measurement of physico-chemical conditions (temperature, salinity, dissolved oxygen, turbidity and dissolved metals) and current flow.</p> <p>3. Join a pioneering journey towards comprehensive understanding. By leveraging standardised data management and AI pipelines, Marine ecosystem monitoring contributes to essential ocean variables and fosters transformative biodiversity and ecosystem studies.</p>
Link to the HRP Entry	https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/horizon-results-platform/88903
KER#4 Oil Spill Detection	
Result Description (1200 characters)	<p>About: WITOIL (Where Is the Oil) is a multi-model Decision Support System (DSS) on-demand service that forecasts transport and weathering of actual or hypothetical oil spills in the global, regional European Seas, and in the selected coastal areas. WITOIL uses the MEDSLIK-II oil spill model forced by operational meteo-oceanographic services. The service has been further refined by using labelled image datasets from Sentinel 1, Sentinel 2 and Landsat 8 satellites to improve existing deep-learning algorithms and the AI-supported detection of oil spills. WITOIL is now an operational service in the iMagine-AI platform and interfaces with the existing operational marine pollution oil spill monitoring and modelling service running at CMCC. Relevant guidelines and documentation are also available to promote the service uptake.</p> <p>Impact: With WITOIL, Policymakers can better understand the problem, which will lead to the development of more effective policies, mitigation strategies, and further funding for technologies related to mitigating the environmental impact of oil spills.</p>
Result Type	Services

Key Value Proposition	<ol style="list-style-type: none"> 1. WITOIL leverages ML-based algorithms and deep learning to uncover pollution hotspots, understand "ghost spills," and refine predictions, equipping decision-makers with vital insights for informed actions. 2. WITOIL's integrated service offers a remarkable 10x reduction in expenses compared to traditional aerial monitoring. 3. WITOIL offers 70% greater accuracy in oil spill detection while delivering advanced analytics (e.g., spill volume, type of oil).
Link to the HRP Entry	https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/horizon-results-platform/87962
KER#5 Flowcam Plankton Identification	
Result Description (1200 characters)	<p>About: Flowcam phytoplankton identification service uses a deep learning image recognition algorithm based on a Convolutional Neural Network (CNN) on Flowcam image data residing in the institute's internal MongoDB database for taxonomic identification of phytoplankton. The output data has FAIRness characteristics following the Darwin Core standards and relevant vocabularies. With an operational environment in the iMagine-AI platform for processing images and storing the output data along with relevant guidance and documentation material, the service is available for users. A long-term (>4y) high-quality phytoplankton image dataset is also available for exploitation.</p> <p>Impact: The global description of the abundance and diversity of phytoplankton communities yields an indication of the health of marine ecosystems and their response to anthropic stressors. As such, the image-derived phytoplankton community characteristics are used in three common Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR) indicators for the Good Environmental Status Assessment for pelagic habitats under Descriptor 1 (Biodiversity).</p>
Result Type	Services
Key Value Proposition	<ol style="list-style-type: none"> 1. Leverage cutting-edge deep learning to accurately identify and classify these crucial marine organisms, fostering a comprehensive understanding of biodiversity. 2. Experience streamlined image processing and storage, optimising taxonomic identification and data management.

	3. Harness the FAIRness of output data, adhering to Darwin Core standards, and contributing to efficient biomonitoring for marine ecosystem health.
Link to the HRP Entry	https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/horizon-results-platform/87972
KER#6 Three Prototype AI Imaging Services for Aquatic Science	
Result Description (1200 characters)	<p>About: The underwater noise identification service utilises a neural network to recognise acoustic events in the spectrograms. These spectrograms are generated by post-processing acoustic underwater recordings by the broadband acoustic network of a LifeWatch marine observatory. The Beach Monitoring system detects <i>Posidonia oceanica</i> berms and rip currents detection in addition to shoreline detection using long-term time-series data. This data has been collected by systematic and continuous monitoring of beaches using cameras since 2011. The freshwater diatoms identification system uses AI to identify freshwater diatoms using microscopic images based on morphological characteristics.</p> <p>Impact: By addressing sound pollution, coastal risks, and water quality, these services contribute to marine ecosystem preservation and efficient environmental monitoring across Europe.</p>
Result Type	Services
Key Value Proposition	<ol style="list-style-type: none"> 1. Enhanced Marine Understanding: The underwater noise detection, beach monitoring, and freshwater diatom identification services offer deeper insights into species interactions, coastal dynamics, and ecosystem health. 2. Efficient Environmental Monitoring: By automating the analysis of underwater sounds, beach features, and diatom species, the services streamline data processing, enabling more efficient and accurate environmental monitoring that contributes to informed decision-making. 3. Policy and Conservation Impact: These services support policy decisions by providing essential indicators of marine health and ecosystem changes, and guiding strategies for pollution mitigation, coastal protection, and conservation efforts.

Link to the HRP Entry	https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/horizon-results-platform/87976
KER#7 The iMagine-AI Platform	
Result Description (1200 characters)	<p>About: The iMagine-AI Framework and Computing Platform facilitate transparent AI model training, sharing, serving, and publication. Harnessing the expansive capabilities of the EGI Federation, this platform capitalises on its hyper-scale distributed computing prowess, effectively eliminating bottlenecks in computational resources. The iMagine AI framework is instrumental in both model development and the delivery of AI services. For model development, it provides an agile environment for prototyping AI models, offering JupyterLab instances, extensive data science, AI, deep learning frameworks, and GPU-powered model training. In the realm of AI service delivery, the iMagine framework adopts a serverless approach, enabling scalable, high-performance deployment of AI models. The served models seamlessly leverage the iMagine API, integrating with external image repositories and facilitating event-based data processing.</p> <p>Impact: Through all this, users can rapidly iterate AI models, optimise them, and efficiently serve them to scientific end users.</p>
Result Type	Services
Key Value Proposition	<ol style="list-style-type: none"> 1. Seamlessly integrate AI into aquatic sciences with the iMagine Framework. Leverage state-of-the-art technologies to amplify research capabilities, streamline processes, and drive innovation. 2. Harness the EGI Federation's hyperscale distributed computing to eliminate computational barriers. Benefit from vast computing facilities, GPUs, CPUs, and storage resources, ensuring scalability for projects of any magnitude. 3. From prototyping to deployment, the iMagine AI framework offers an agile environment. Rapidly iterate AI models, optimise them, and efficiently serve them to scientific end users, supported by continuous integration and serverless architecture. 4. Join forces with the iMagine Competence Centre, a hub of AI and IT experts. Unlock the potential of synergistic

	collaboration, garnering insights from diverse fields and fostering cross-fertilisation.
Link to the HRP Entry	https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/horizon-results-platform/88900
KER#8 Best Practices	
Result Description (1200 characters)	<p>About: Drawing from the experiences of use case development, the Competence Centre's support, and insights from AI projects and existing literature, iImagine has compiled a series of Best Practice documentation. This documentation encapsulates overarching approaches for adopting AI and setting up AI image processing workflows, how to make optimal use of the iImagine framework and platform for practical developments, training of models, and going into operation. These practices have been illustrated with practical insights and examples by showcasing both operational and prototype aquatic services from the iImagine project.</p> <p>Impact: This documentation will serve as a versatile resource for projects, researchers, students, and other stakeholders alike, enabling them to delve into AI techniques and begin their explorations. This knowledge repository will guide future AI adopters and users, providing a roadmap for harnessing the potential of AI within the aquatic sciences and beyond.</p>
Result Type	Other
Key Value Proposition	<ol style="list-style-type: none"> 1. iImagine's Best Practices documentation streamlines the adoption of AI techniques, empowering users to seamlessly integrate AI image processing workflows, reducing operational hurdles and accelerating project timelines. 2. Unlock the power of AI through tangible insights and real-world examples showcased in the Best Practices documentation.
Link to the HRP Entry	https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/horizon-results-platform/87767

Project Results, IP and Licensing Strategy

For each of the results, the Innovation Manager and the result owner jointly reviewed the Intellectual Property(IP) status. Since iMagine builds on a lot of pre-existing open source software and new code, we catalogued any third-party components and ensured that compatible open-source licences were used.

Background IP

Background IP is knowledge/IP relevant to a collaborative project and supplied by the partners at the start of the project. Background IP was identified as part of the Consortium Agreement. The task continuously monitored if all the required Background IP was listed as part of the agreement and did not find any need to extend the list of background IP provided.

Sideground IP

Sideground IP is knowledge/IP that is relevant to a collaborative project but produced outside the project by any of the partners during the project's tenure.

Table 2 Project Sideground IP

Name	Short Description	IP Owner(s)	IP protection or license used
AI4Dashboard	The dashboard is the entry point to the AI platform	CSIC; INFN; UPV; IISAS; PSNC; Predictia	Protection: Copyright License: Apache 2.0 Repository: https://github.com/ai4os/ai4-dashboard
AI4EOSC- Platform API	Platform API for interacting with the AI4EOSC services	CSIC; UPV	Protection: Copyright License: Apache 2.0 Repository: https://github.com/ai4os/ai4-papi

AI4OS Hub Modules Template	Templates for developing new modules and for users performing retraining of an existing AI4OS-Hub module in the AI4OS Platform	KIT	Protection: Copyright License: MIT Repositories: <ul style="list-style-type: none"> • https://github.com/ai4os/ai4-template-adv • https://github.com/ai4os/ai4-template-child • https://github.com/ai4os/ai4-template
OSCAR	OSCAR is an open-source platform that supports the event-driven serverless computing model for data-processing applications	UPV	Protection: Copyright License: Apache 2.0 Repository: https://github.com/grycap/oscar

Third-Party IP

Third-party IP is knowledge/IP that is relevant to a collaborative project but supplied by third parties other than the project consortium.

No third-party IP relevant to the project has been identified yet.

Foreground IP

Foreground IP is captured during the project's execution, and it is important to ensure that sufficient rights exist to ensure the successful exploitation of the project results to which this IP is connected.

Licensing Strategy

The Intellectual Property (IP) approach was straightforward due to a strong open science mandate.

1. **Licenses for Software:** All software components developed in iMagine have been released under open-source licenses, allowing free use, modification, and redistribution. The choice of license was made on a case-by-case basis to balance permissiveness with any dependencies' requirements.
 - a. Most software (AI models, platform code, analysis pipelines) is under the Apache License 2.0 or MIT License. These are permissive licenses that impose minimal restrictions. This choice encourages uptake even by industry, as they can use the code in proprietary products if desired. It's also

compatible with integration into EOSC and AIOD, which generally prefer open and permissive licensing for contributed tools

- b. Some code that linked to copyleft dependencies was released under the GNU GPL v3. For instance, if our code used a GPL-licensed library, we had to use GPL.
2. **License for Demos:** The demos/tutorials/webinars arranged as part of the iImagine project have been uploaded to the EGI YouTube³ channel and are available in a playlist⁴. All these videos are marked with a Creative Commons⁵ license.
3. **Licensing of Documents and Datasets:** Project Deliverables, Promotional materials (except logos and icons), Website Content, and Datasets (image collections, annotated data) are released under a CC-BY 4.0 International license (attribution required) in the iImagine Zenodo community.
4. **Publications:** Publications are a key scientific output of the project. All the publications are either native open access or available in an open-access version.
5. **Brand Identity:** The iImagine project logo, its variants, and the set of KER icons are Copyright© 2022–2025 EGI Foundation as Project Coordinator. No trademark registration has been sought; copyright protection is therefore the primary mechanism to prevent misuse or misrepresentation of the project’s visual identity. Under a standing permission granted by EGI Foundation, consortium partners may reproduce the logo and KER icons without prior written approval for any activity directly connected to the iImagine project (e.g. deliverables, publications, presentations, webinars, event signage). Third parties may likewise reproduce these graphics free of charge for the sole purpose of describing, referencing, or promoting iImagine results, provided that:
 - a. The artwork is used unaltered (colour and proportions intact);
 - b. Usage is accompanied by the attribution “© EGI Foundation, iImagine project (2022–2025)”;
 - c. The context does not imply endorsement by either the EGI Foundation or the iImagine consortium of any unrelated product, service, or organisation.

Any use outside these conditions, such as commercial merchandising, substantial modification of the artwork, or association with non-project activities, requires written permission from EGI Foundation (contact: info@egi.eu).

Foreground Registry

Throughout the project, as reported in D2.5, a simple Foreground IPR registry was maintained. This was essentially a table listing each result, the owner organisation, the

³ https://www.youtube.com/@EGI_elnfra/

⁴ https://www.youtube.com/watch?v=bjrUqi-yjdc&list=PL8MrRo-3u8hvsQTnJgTM3pine6y_JHezc

⁵ <https://support.google.com/youtube/answer/2797468>

license chosen, and whether any IP restrictions exist. The table below presents the list of documented Foreground IPs and the related rights and licenses

Table 3 Project Foreground IP

Intellectual Property	Type	Related Key Exploitable Result	Owners for Exploitation	Protection / License	Link
Litter Assessment Service	Software Code	KER1	DFKI	MIT	https://github.com/ai4os-hub/litter-assessment
Multi-Plankton Separation (Zooscan) Service	Software Code	KER2	SU	MIT	https://github.com/ecotaxa/ZooProcess-front https://github.com/ecotaxa/ZooProcess-back https://github.com/ecotaxa/ZooProcess-python
Code for Multi-Plankton Separation (Zooscan) Service	Software Code	KER2	SU	MIT	https://github.com/ecotaxa/DEE P-OC-multi_plankton_separation?tab=readme-ov-file https://github.com/ecotaxa/multi_plankton_separation
Segmentation masks of ZooScan images, focusing on images with several objects separated by a human operator	Dataset	KER2	SU	CC-BY 4.0	https://www.seanoe.org/data/O0885/99663/

Intellectual Property	Type	Related Key Exploitable Result	Owners for Exploitation	Protection / License	Link
Long term series dataset of the planktonic monitoring at Villefranche-sur-mer	Dataset	KER2	SU	CC-BY 4.0	https://ipt.gbif.fr/resource?r=plankton_community_in_judaybogorov_net_19662025_point_b_villefranchesurmer_france&request_locale=en
ZooScan Protocol	Document	KER2	SU	CC-BY 4.0	https://doi.org/10.5281/zenodo.13928156
Labelled Images at OBSEA for Object Detection Algorithms	Dataset	KER3	UPC	CC-BY 4.0	https://zenodo.org/records/10809434
Underwater images from OBSEA fish detection training dataset (YOLO)	Dataset	KER3	UPC	CC-BY 4.0	https://zenodo.org/records/14888440
AI-based fish detections at Slagreef biotop deployed near the OBSEA Underwater Observatory	Dataset	KER3	UPC	CC-BY 4.0	https://zenodo.org/records/14916725
AI-based fish detections at OBSEA Underwater Observatory	Dataset	KER3	UPC	CC-BY 4.0	https://zenodo.org/records/14916451

Intellectual Property	Type	Related Key Exploitable Result	Owners for Exploitation	Protection / License	Link
AI-based fish detections at OBSEA Underwater Observatory during a dolphin carcass experiment, March–July 2023	Dataset	KER3	UPC	CC-BY 4.0	https://zenodo.org/records/14916832
AI-based fish detections at OBSEA Underwater Observatory during a dolphin carcass experiment, May–July 2024	Dataset	KER3	UPC	CC-BY 4.0	https://zenodo.org/records/14917278
OBSEA Fish Detection Service	Software Code	KER3	UPC	AGPL–3.0	https://github.com/ai4os-hub/obsea-fish-detection
Paper: Tools for ecosystem monitoring based on fish detection and classification using deep neural networks	Publication / Conference Proceedings	KER3	UPC	CC-BY-NC-ND 4.0	https://hdl.handle.net/2117/411165
Paper: Evaluating the biological impact of an artificial reef using deep learning techniques	Publication / Conference Proceedings	KER3	UPC	CC-BY-NC-ND 4.0	https://hdl.handle.net/2117/411235

Intellectual Property	Type	Related Key Exploitable Result	Owners for Exploitation	Protection / License	Link
Paper: Detect and follow a custom object, using OBSEA underwater crawler	Publication / Conference Proceedings	KER3	UPC	CC-BY-NC-ND 4.0	https://hdl.handle.net/2117/411117
Paper: AI-based fish detection and classification at OBSEA underwater observatory	Publication / Conference Proceedings	KER3	UPC	Open Access.	https://hdl.handle.net/2117/418458
Smartbay Marine Species Object Detection Training Dataset	Dataset	KER3	MI	CC-BY 4.0	https://zenodo.org/records/14917278
Smartbay Marine Types Object Detection Training dataset	Dataset	KER3	MI	CC-BY 4.0	https://zenodo.org/records/13989527
Nephrops (Nephrops norvegicus) Burrow object detection simple training dataset from Irish Underwater TV surveys	Dataset	KER3	MI	CC-BY 4.0	https://zenodo.org/records/13987958
Prawn Burrow Detection Service	Software Code	KER3	MI	GNU AGPL 3	https://github.com/ai4os-hub/smartbay-prawn-burrow-detection

Intellectual Property	Type	Related Key Exploitable Result	Owners for Exploitation	Protection / License	Link
Smart Bay Species Detection Service	Software Code	KER3	MI	GNU AGPL 3	https://github.com/ai4os-hub/smartbay-species-detection
Smart Bay Marine Types Service	Software Code	KER3	MI	GNU AGPL 3	https://github.com/ai4os-hub/smartbay-marine-types
Deep-sea observatories images labelled by citizens for object detection algorithms	Dataset	KER3	IFREMER	CC-BY 4.0	https://doi.org/10.17882/101899
Deep Species Detection Service	Software Code	KER3	IFREMER	GNU AGPL 3	https://github.com/ai4os-hub/deep-species-detection
Bayesian Optimisation Framework	Software Code	KER4	CMCC	GNU AGPL 3	https://github.com/CMCC-Foundation/bayes_opt_mdk2
WITOIL for iMagine	Software Code	KER4	CMCC	GNU AGPL 3	https://github.com/ai4os-hub/WITOIL-for-iMagine
Improving Oil Slick Trajectory Simulations with Bayesian Optimisation	Publication / Conference Proceedings	KER4	CMCC	CC-BY-NC-ND 4.0	https://arxiv.org/abs/2503.02749 https://doi.org/10.1016/j.ecoinf.2025.103368
Segmented oil spills	Dataset	KER4	OrbitalEOS	CC-BY-NC 4.0	https://zenodo.org/records/11354663

Intellectual Property	Type	Related Key Exploitable Result	Owners for Exploitation	Protection / License	Link
Phytoplankton species classifier	Software Code	KER5	VLIZ	Apache 2.0	https://github.com/lifewatch/phyto-plankton-classification
LifeWatch observatory data (Training set)	Dataset	KER5	VLIZ	CC-BY 4.0	https://zenodo.org/records/10554845
LifeWatch observatory data (Labelled set)	Dataset	KER5	VLIZ	CC-BY 4.0	https://www.vliz.be/nl/imis?dasiid=4688&doiid=949
EyeOnWater training dataset for assessing the inclusion of water quality images	Dataset	KER6	MARIS	CC-BY 4.0	https://doi.org/10.5281/zenodo.10777440
SCLabels: Labelled rectified RGB images from the Spanish CoastSnap network	Dataset	KER6	SOCIB	CC-BY 4.0	https://doi.org/10.5281/zenodo.10159977
BWILD: Beach Seagrass Wrack Identification Labelled Dataset	Dataset	KER6	SOCIB	CC-BY 4.0	https://doi.org/10.5281/zenodo.11354662
RipAID: Rip Current Annotated Image Dataset	Dataset	KER6	SOCIB	CC-BY 4.0	https://doi.org/10.5281/zenodo.15082426

Intellectual Property	Type	Related Key Exploitable Result	Owners for Exploitation	Protection / License	Link
AIS-annotated Hydrophone Recordings for Vessel Classification	Dataset	KER6	VLIZ	CC-BY 4.0	https://doi.org/10.14284/723
Transfer Learning for Distance Classification of Marine Vessels using Underwater Sound.	Publication / Conference Proceedings	KER6	VLIZ	CC-BY 4.0	https://doi.org/10.1109/JSTARS.2025.3593779
Underwater Noise Monitoring Service	Software Code	KER6	VLIZ	MIT	https://github.com/woutdecrop/audio_vessel_distance_categorizer
Diatom Identification Service	Software Code	KER6	UL	GNU AGPL 3	https://github.com/ai4os-hub/diamorph-classification
Usefulness of synthetic datasets for diatom automatic detection using a deep-learning approach	Publication / Conference Proceedings	KER6	UL	CC BY-NC-ND 4.0	https://doi.org/10.1016/j.engappai.2022.105594 https://hal.science/hal-03852321v1
Integrating Visual and Semantic Similarity Using Hierarchies for Image Retrieval	Publication / Conference Proceedings	KER6	UL	Open Access	https://dx.doi.org/10.1007/978-3-031-44137-0_35 https://hal.science/hal-04423201v1

Intellectual Property	Type	Related Key Exploitable Result	Owners for Exploitation	Protection / License	Link
Gaussian Latent Representations for Uncertainty Estimation using Mahalanobis Distance in Deep Classifiers	Publication / Conference Proceedings	KER6	UL	Open Access	https://dx.doi.org/10.48550/arXiv.2305.13849 https://hal.science/hal-04034465v2
"UDE DIATOMS in the Wild 2024": a new image dataset of freshwater diatoms for training deep learning models	Dataset	KER6	UL	CC-BY 4.0	https://doi.org/10.1093/gigascience/giae087
Deep Learning Based Characterization of Cold-Water Coral Habitat at Central Cantabrian Natura 2000 Sites Using YOLOv8	Publication / Conference Proceedings	KER6	IEO-CSIC	CC-BY 4.0	https://doi.org/10.3390/jmse12091617
Dashboard Look and Feel Customisations	Software Code	KER7	CSIC	Apache 2.0	https://github.com/ai4os/ai4-dashboard
Improvements to API for creating new prototyping deployments using Nomad and OSCAR (Branding, AAI integration; OSCAR integration)	Software Code	KER7	CSIC	Apache 2.0	https://github.com/ai4os/ai4-papi

Intellectual Property	Type	Related Key Exploitable Result	Owners for Exploitation	Protection / License	Link
Improvements to the Templates service to bootstrap repository structure, compatible with the iImagine platform? (Branding, AAI integration)	Software Code	KER7	KIT	MIT License	https://github.com/ai4os/ai4-template-adv https://github.com/ai4os/ai4-template-child https://github.com/ai4os/ai4-template
Streaming processing services (Deployment of stream processing services via Kafka, focused on video processing)	Software Code	KER7	CSIC	Closed access.	This piece of software code will not be made public.
Improvements to OSCAR (Branding, AAI integration, dashboard integration, accounting module to get usage metrics, UI enhancements)	Software Code	KER7	UPV	Apache 2.0	https://github.com/grycap/oscar
Best practices for AI-based image analysis applications in aquatic sciences: The iImagine case study	Publication / Conference Proceedings	KER8	KIT	CC-BY 4.0	https://doi.org/10.1016/j.ecoinf.2025.103306
iImagine: AI-Powered Image Data Analysis in Aquatic Science	Publication / Conference Proceedings	KER8	KIT	CC-BY 4.0	https://doi.org/10.1145/3732775.3733584

Intellectual Property	Type	Related Key Exploitable Result	Owners for Exploitation	Protection / License	Link
iMagine D4.4 Best Practices and Guideline Updated for Developers and Providers of AI-based Image Analytics Services	Publication / Conference Proceedings	KER8	KIT	CC-BY 4.0	https://doi.org/10.5281/zenodo.14961558
iMagine D3.4 Best practices for producers and providers of image sets and image analysis applications in aquatic sciences	Publication / Conference Proceedings	KER8	KIT	CC-BY 4.0	https://doi.org/10.5281/zenodo.13864196
iMagine D4.1 Best practices and guidelines for developers and providers of AI-based image analytics services	Publication / Conference Proceedings	KER8	KIT	CC-BY 4.0	https://doi.org/10.5281/zenodo.7372357
iMagine Logo	Artistic Work	N/A	EGI	Copyright. All Rights Reserved	
iMagine KER Icons	Artistic Work	All KERs	EGI	Copyright. All Rights Reserved	
iMagine Webinars and Mature Services Demo (8)	Videos	All KERs	EGI	CC-BY 4.0	https://www.youtube.com/watch?v=bjrUqi-yjdc&list=PL8MrRo-3u8hvsQTnJgTM3pine6y_Jhezcz

Intellectual Property	Type	Related Key Exploitable Result	Owners for Exploitation	Protection / License	Link
iMagine Website	Other	All KERs	EGI	CC-BY 4.0	https://www.imagine-ai.eu/
Project Presentations (x22)	Document	All KERs	EGI	CC-BY 4.0	https://zenodo.org/communities/imagine-project/records?q=&f=resource_type%3Apresentation&l=list&p=1&s=10&sort=newest
Other Project Deliverables (x29)	Document	All KERs	EGI	CC-BY 4.0	https://zenodo.org/communities/imagine-project/records?q=&f=resource_type%3Apublication%2Binner%3Apublication-deliverable&l=list&p=1&s=10&sort=newest
Other Promotional Materials (x8 posters)	Artistic Work	All KERs	EGI	CC-BY 4.0	https://zenodo.org/communities/imagine-project/records?q=&f=resource_type%3Aposter&l=list&p=1&s=10&sort=newest

Expected/Potential IP

In the coming weeks we are expecting a few more additional assets to be made public, potentially. Here is a list of what is currently expected.

Table 4 Project Expected IP

Intellectual Asset	Type	Related KER	License	Owner
Remote Sensing-Based Litter Detection	Publication / Conference Proceedings	KER1	Open Access	DFKI
Long-term changes in zooplankton communities in the North-West Mediterranean	Publication / Conference Proceedings	KER2	Open Access	SU
Live Stream fish detection	Publication / Conference Proceedings	KER3	Open Access	CSIC/UPC
Oil Spill Documentation	Documentation	KER4	CC BY 4.0	CMC C
Design and Implementation of an Automated Image Classification Workflow	Publication / Conference Proceedings	KER5	Open Access	VLIZ
Blending Physical and Artificial Intelligence Models to Improve Satellite-Derived Bathymetry Mapping	Publication / Conference Proceedings	KER6	Open Access	ICMAN-CSIC

Exploitation Strategy

Exploitation is the use of results in further research and innovation activities other than those covered by the action concerned; this includes, among other things, commercial exploitation such as developing, creating, manufacturing and marketing a product or process, creating and providing a service, or in standardisation activities.

Licensing Strategy Implications

The open IP strategy has several implications for exploitation:

1. **Maximum Uptake:** Anyone is free to use iImagine results, which greatly supports scientific exploitation (enabling other researchers to build upon our work without legal barriers) and even commercial exploitation by third parties (e.g., a startup could utilise our service code to offer services). This wide uptake potential aligns with the project's mission to impact the community. We expect that making tools open will lead to citations and integration in future projects, for example, by the winners of the upcoming "*HORIZON-INFRA-2025-01-EOSC-05⁶: Using Generative AI (GenAI4EU) for Scientific Research via EOSC*" call.
2. **Standardisation and Openness:** Having openly licensed outputs makes it easier to contribute to standards.
3. **No Direct Revenue from IP:** We do not plan to generate license revenue; exploitation will not be in the form of selling software licenses (unlike some projects that keep software proprietary and license it).
4. **Competition and Collaboration:** By open-sourcing, we invite competition in principle (others could fork our code and compete). However, in practice, we judge this risk low in our niche. On the contrary, competition is tempered by collaboration opportunities: external developers might improve these services. One risk is a lack of incentive for partners to continue investing if there is no IP ownership advantage, but this is mitigated by the alignment between the services with partners' core interests (scientific or service-oriented), which provides an intrinsic incentive to maintain these services.

Exploitation Strategy and Activities

This section provides a holistic view of how the exploitation of iImagine results has been and will be carried out. We distinguish between joint exploitation (collective actions by the consortium or multiple partners together) and individual exploitation (actions by single partners leveraging project results in their context).

Exploitation Channels

The following table documents the various exploitation channels that were already identified in D2.5.

Table 5 Project KER Exploitation Channels

Key Exploitable Result	Exploitation Channels
All KERs	<ul style="list-style-type: none"> • Discoverable through Horizon Results Platform. • Open-source and restriction-free licensing of components to promote exploitation.

⁶ https://cordis.europa.eu/programme/id/HORIZON_HORIZON-INFRA-2025-01-EOSC-05

	<ul style="list-style-type: none"> ● Onboarded to the EOSC and AIO Marketplaces and on Zenodo/Other Open Repositories. ● Inclusion in the service portfolio of consortium partners. ● Using the developed components for further research projects. ● Continue the development of the developed services ● Publications.
KER#1 Marine Litter Assessment	<ul style="list-style-type: none"> ● Operational service is available to users through this link⁷. ● Using the developed mapping from initial litter categories to EU JointList categories for future research projects to achieve better standardisation. ● Contributing to indicators such as the EU Marine Strategy Framework Directive (MSFD) and the EU Green Deal.
KER#2 ZooProcess	<ul style="list-style-type: none"> ● Operational service is available to users through this link⁸. ● Plankton indicators are used within several descriptors of the MSFD and WFD.
KER#3 Marine Ecosystem Monitoring	<ul style="list-style-type: none"> ● Operational service is available to users through this links: Smartbay Service⁹, Ifremer Service¹⁰, OBSEA Service¹¹. ● Essential Ocean Variables (EOVs) available from the EMSO sites, along with the annotated imagery, will contribute towards further biodiversity and ecosystem studies.
KER#4 Oil Spill Detection	<ul style="list-style-type: none"> ● Operational service is available to users through this link¹². ● The output will contribute to Policy developments and better mitigation strategies.
KER#5 Flowcam Plankton Identification	<ul style="list-style-type: none"> ● Operational service is available to users through this link¹³. ● The image-derived phytoplankton community characteristics are used in three common OSPAR indicators for the Good Environmental Status

⁷ <https://www.imagine-ai.eu/service/litter-assessment-service>

⁸ <https://www.imagine-ai.eu/service/zoo-process-service>

⁹ <https://www.imagine-ai.eu/service/marine-ecosystem-monitoring-service-emso-smartbay>

¹⁰ <https://www.imagine-ai.eu/service/marine-ecosystem-monitoring-service-azores>

¹¹ <https://www.imagine-ai.eu/service/marine-ecosystem-monitoring-service-emso-obsea>

¹² <https://www.imagine-ai.eu/service/witool-service>

¹³ <https://www.imagine-ai.eu/service/phytoplankton-identification-service>

	Assessment for pelagic habitats under Descriptor 1 (Biodiversity).
KER#6 Prototype Imaging Services	<ul style="list-style-type: none"> • Further development for turning them into production services.
KER#7 iMagine AI Platform	<ul style="list-style-type: none"> • The platform is available for development to the users (internal and external) through this link¹⁴. • Integrate the improvements from the iMagine project to the upstream AI4EOSC platform. • The commercialisation of the platform for industrial cases through the creation of an SME and collaboration with DIHs.
KER#8 Best Practices	<ul style="list-style-type: none"> • Available through the website section¹⁵ and Zenodo community. • Make them available through the Ocean Best Practices System. • Help new employees or short-term student research assistants get a head start and shorten development time to get into the topic of AI for marine science. • Increase the knowledge of research communities and streamline the development of AI services.

Activities Undertaken

1. Hosted on EGI Federation cloud, the iMagine AI platform offers self-service GPU compute, model training, inference and result-sharing for aquatic-science researchers worldwide. The platform was used by 16 use cases in the course of the project. More specific details on the computing capacity delivered, the number of models developed, the models trained, and others will be available in D4.5 Final periodical assessment of AI and Infrastructure services¹⁶.
2. To further exploit the iMagine AI platform, the Competence Centre, and to increase the impact of the project, the project launched an open Call for Use Cases¹⁷ (now closed), offering technical support and free compute credits to external research groups. Six external use cases were selected through the open call to build new AI workflows on the platform. These use cases acted both as an input and also an exploitation channel for the best practices documented by the project. Here are the 6 use cases,
 - a. Cold Water Coral Reefs¹⁸
 - b. Satellite-derived Bathymetry¹⁹

¹⁴ <https://www.imagine-ai.eu/services/imagine-ai-platform>

¹⁵ <https://www.imagine-ai.eu/services/best-practices-ai-based-image-processing>

¹⁶ <https://zenodo.org/records/16943248>

¹⁷ <https://www.imagine-ai.eu/article/imagine-call-for-use-cases>

¹⁸ <https://www.imagine-ai.eu/case-study/cold-water-coral-reefs>

¹⁹ <https://www.imagine-ai.eu/case-study/satellite-derived-bathymetry>

- c. Fish Otoliths²⁰
 - d. EyeOnWater²¹
 - e. Sea Wave and coastal inundation detection Methodology (SWiM)²²
 - f. DEAL²³
3. As has been reported in the **Key Exploitable Results** section, all the KERs have been made visible through the Horizon Results Platform.
 4. Similarly, we have discussed the open and restriction-free license strategy that the project has adopted to promote uptake and exploitation in the Licensing Strategy section. The **Foreground Registry** provides links to the various results.
 5. In the same vein as discussed in the Licensing Strategy section, all the project deliverables, key presentations and datasets generated by the project have been uploaded to the iImagine Zenodo Community²⁴.
 - a. Specific focus should be highlighted on the joint activities carried out with the Zenodo team under the umbrella of the Horizon-ZEN²⁵ project. Thanks to this pilot, iImagine could request the customisation of the “dataset” metadata fields for a more accurate description of the (aquatic science) data included. These customisations are available now and can be exploited by any other projects related to aquatic sciences. Further customisations like the inclusion of the WORMS catalogue as a look-up page for Taxonomic information in the Zenodo input form are planned for the latter part of the year.
 6. The scientific excellence of the project has been documented and demonstrated through a large number of peer-reviewed publications which can be found on the website²⁶.
 7. All the key iImagine assets (services, use cases, website, deliverables) have been onboarded to the AloD platform. Details about this can be found in *D2.7 EOSC and ‘AI on Demand’ liaison and integration updated plan*²⁷.
 8. A key part of achieving uptake is to promote and disseminate the results effectively.
 - a. The iImagine website²⁸ provides up-to-date information about the internal and external use cases, the various AI services and the means to access them. The website features interactive cards offering one-click access to code, data and docs.
 - b. The project and its results have been promoted at various events to a wide number of audiences. The detailed list of this can be found in D2.8 Final Communication, Dissemination and Engagement plan²⁹.

²⁰ <https://www.imagine-ai.eu/case-study/fish-otoliths>

²¹ <https://www.imagine-ai.eu/case-study/eyeonwater>

²² <https://www.imagine-ai.eu/case-study/coastal-inundation-and-wave-breaking-detection-algorithm>

²³ <https://www.imagine-ai.eu/case-study/decentralised-learning-deal>

²⁴ <https://zenodo.org/communities/imagine-project/>

²⁵ <https://about.zenodo.org/projects/horizon-zen/>

²⁶ <https://www.imagine-ai.eu/results-resources/imagine-publications>

²⁷ <https://doi.org/10.5281/zenodo.14756502>

²⁸ <https://www.imagine-ai.eu/>

²⁹ <https://zenodo.org/records/16943276>

- c. To increase the uptake of the iImagine services and to educate the users, webinars and training sessions were organised. These webinars were well attended and also endorsed by the OCEAN Decade Network³⁰.
9. The project also developed three Policy Briefs, which translate project insights into recommendations for EC ocean health and AI policy agendas.
 - a. Policy Brief RP1³¹
 - b. Policy Brief RP2³²
 - c. Policy Brief RP3³³
10. Federated IT Service Management (FITSM)³⁴ trainings were also organised to train the service providers so that they could implement a free, lightweight ITSM for their services.
11. All these activities indicate that the mature AI services have been available for early adopters for a few months already. The different delivery mechanisms adopted by these services are documented in *D3.3 AI application upgrade/deployment, and operation plan*³⁵. The metrics associated with these services will be presented in *D5.3 Final periodical assessment of Imaging VA services*³⁶.
12. Similarly, the prototype use cases have completed their validation. The details about the validation and output, along with the status of the external use cases, can be found in *D3.5 Validated prototype services for 3 image analysis use cases*³⁷.
13. The project has also leveraged other projects to,
 - a. Showcase interoperability (like in the case of Blue-Cloud 2026³⁸ to showcase execution of iImagine services in the d4science platform³⁹ or in the case Ai4Life exploring the automated data ingestion from the AI4Life BioImage Archive into the platform, followed by interoperability at the AI model level, making it possible to consume and deploy AI4Life-developed models within the platform and vice versa.)
 - b. Improve Outreach⁴⁰ (through joint workshops, sessions and cross-channel dissemination with projects like ANERIS⁴¹, Blue-Cloud 2026)
 - c. For co-design (like Horizon-Zen as mentioned earlier, the requirements from the iImagine use cases for (new) features related to the iImagine AI platform are collected, and the technological developments of these features are carried out in the AI4EOSC project.
14. The AI services have or will be in near future embedded in the regular activities of partner institutions.

³⁰ <https://oceandecade.org/events/imagine-webinar-series/>

³¹ <https://doi.org/10.5281/zenodo.10704526>

³² <https://doi.org/10.5281/zenodo.13593413>

³³ <https://zenodo.org/records/16943330>

³⁴ <https://www.fitsm.eu/>

³⁵ <https://doi.org/10.5281/zenodo.11520845>

³⁶ <https://zenodo.org/records/16943305>

³⁷ <https://doi.org/10.5281/zenodo.16638761>

³⁸ <https://blue-cloud.org/>

³⁹ <https://www.d4science.org/about-us>

⁴⁰ <https://www.imagine-ai.eu/news-events/events>

⁴¹ <https://aneris.eu>

15. The DIGI4ECO⁴² project, a project looking at "Digital Twin-sustained 4D Ecological Monitoring of Restoration in Fishery Depleted Areas..." is hoping to use the training datasets and models developed by Smartbay in their work.

Potential Activities for the Future

To better understand the extent and intention of the partners to extend iImagine activities once the project has ended, partners were asked to sign a non-binding Letter of Intent (LoI). The draft version of this letter is presented in **ANNEX 1: Letter of Intent Draft**. 21 partners have signed an LoI by the time of writing of this deliverable, and we expect that the remaining partners will provide one in the coming weeks.

Joint Exploitation by the Consortium

Joint exploitation refers to efforts that the consortium (or a subset of partners acting together) will continue to maximise the uptake of project results. All the partners who have signed the LoI have agreed to these activities. The key areas of joint exploitation are:

1. **Promotion and Networking:** Partners will continue promoting, where possible, iImagine outcomes in relevant forums.
2. **Follow-up Projects and Funding:** Partners will remain engaged with other iImagine partners and the broader community in good faith and contribute to identifying new opportunities for cooperation, joint proposals, or follow-up projects, including the formation of new consortia. Some potential reuse of the results from the project in upcoming projects/call is discussed in the Sustainability section.

Individual Partner Exploitation Plans

EGL: Maintain the iImagine website and its static content. Include the iImagine AI platform or its underlying technology in the EGL service portfolio, maintain the service, disseminate it and promote it for third-party exploitation through the EGL communications and technical support channels. Support the use case partners in finding computing resources from EGL Federation members, where possible, to continue the development activities.

CMCC: Contribute to the continued development and update of the WITOIL application for the future iImagine evolution through non-commercial initiatives. Provide guidance and assist with addressing queries, issues, or bugs identified by users of the WITOIL for iImagine application compatible with CMCC's institutional scope.

CSIC: Continue with the operational support, to the extent that is possible, of the "DEEP AI Application Development Service" and "DEEP AI Applications as a Service" installations and its derivatives.

⁴² <https://digi4eco.eu/>

DFKI: Maintain the existing code base to enable continued functionality beyond the end of the iImagine project. Where possible, support interested parties and users in utilising the developed system.

IFREMER: Continue with improvement of the assets (pre-processing pipeline, training datasets, models) and related documentation developed under the iImagine project.

INCD/CNCA: Host the services currently deployed in the project.

KIT: Operational support, to the extent that is possible, of the "DEEP – AI Application Development Service" and "DEEP – AI Applications as a Service" installations.

LIP: Maintain the developments performed in the project.

MARIS: Seek support from the Blue-Cloud community and e-infrastructure for sustaining the iImagine platform and services with computing and storage resources as a component of the Blue-Cloud portfolio of services.

MI: Continue to add to and enhance the training datasets and models developed in the iImagine project. Continue to support and maintain the iImagine platform code modules in the iImagine project GitHub repositories.

OGS: Support the use case "marine litter assessment" by aligning technical developments with the policy framework and EMODnet standards.

SOCIB: Continue developing and supporting the software developed as part of the iImagine project.

SU: Continue developing and supporting the software developed as part of the iImagine project. Keep this software open source and available for the community to improve.

TUBITAK: Continue providing GPU and CPU computing capacity from Federated Cloud site TR-FC1-ULAKBIM to enable the project to provide relevant services after its official ending.

UL: Request extension of the resources/services to host the iImagine platform and service. Continue with development of assets, delivery of new service.

UPC: Continue the development and improvement of the AI-based ecosystem monitoring tools for automatic detection of macro-fauna at OBSEA Underwater Observatory. Publish biodiversity data produced by the aforementioned tools in open international repositories, to allow the exploitation of the results by the scientific community.

UPV: Operational support, to the extent that is possible, of the "DEEP – AI Application Development Service" and "DEEP – AI Applications as a Service" installations.

UNITN: Maintain and operate at UNITN the data catalogue set up in WP3 and hosting the oil spills data.

VLIZ: Aim to assist with technical support to help keep iImagine operations stable for FlowCam Phytoplankton Identification Service and the Underwater Noise Identification prototype.

Sustainability

A critical aspect of the exploitation plan is to ensure sustainability, ensuring that the benefits of iImagine's results persist and grow beyond the project's life. This section outlines how each major output will be sustained, what organisational or financial models are in place for continuity, and what future work (follow-up initiatives, enhancements) is anticipated to keep the innovation trajectory moving forward.

Post-project Sustainability

Knowledge Results

iImagine disseminates and preserves its results through GitHub, Zenodo and YouTube. Each platform offers distinct long-term guarantees. The table below summarises the platforms' hosting and retention commitments.

Table 6 Sustainability of Knowledge Results

Platform	Results	Long-Term Hosting Commitments
Zenodo	Datasets; Deliverables; Presentations; Other materials	Objects are stored in CERN's data centres with multiple replicas and daily backups ⁴³ . Zenodo's policy is to retain items "for the lifetime of the repository", defined as at least the next 20 years and as long as CERN exists ⁴⁴ .
Github	Software Code	By default, all public repositories are included in the GitHub Archive Program, a partnership between GitHub and organisations such as Software Heritage Foundation and Internet Archive to ensure the long-term preservation of the world's open-source software. The GitHub Archive Program protects the data on an ongoing basis by storing multiple copies across various data formats and locations ⁴⁵ . Public repositories remain online indefinitely <i>while the account exists</i> ; GitHub may remove content only if it violates policy ⁴⁶ .
YouTube	Tutorials	Videos remain accessible as long as the Google account stays active and the content complies

⁴³ <https://about.zenodo.org/infrastructure/>

⁴⁴ <https://about.zenodo.org/policies/>

⁴⁵ <https://docs.github.com/en/repositories/archiving-a-github-repository/about-archiving-content-and-data-on-github>

⁴⁶ <https://docs.github.com/en/site-policy/github-terms/github-terms-of-service>

		with YouTube's Terms of Service. Google reserves the right to delete an inactive Google account (no sign-in activity across Google products) after 2 years, which would also remove hosted videos ⁴⁷ .
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Services

Short-term sustainability

The technology providers who provide the platform-level services (iImagine AI Platform, OSCAR, etc.) have indicated that the services will continue to be available. The providers will also provide operational support to the extent that is possible as indicated earlier. The infrastructure services and operational support will be provided at no additional cost on a best available basis. There is also commitment from the infrastructure providers (TUBITAK) for the continued delivery of compute capacity towards the iImagine AI platform. ***All this means that the iImagine AI platform will continue to be available to the internal and external use cases both to continue their development activities.***

Similar commitment also exists for the thematic AI services from the responsible partners. **The mature thematic AI services will therefore be also available to both their internal and external users in the inference mode.** External users can also deploy the model on their infrastructure or use their infrastructure to retrain the model with their own data. The service owners have indicated that they will continue to provide support (for inference or retraining) to the users as required.

Medium to Long-term sustainability

The long-term sustainability of the AI services hinges on their embedding in the regular activities of partner institutions. These services provide long-term value to the partners, and therefore, the partners have a vested interest in sustaining them and thus will find a way (small budget, manpower) to do so.

Follow-up Funding

While not guaranteed, we consider follow-up funding a likely outcome given the strength of results. If even one or two significant grants come through, they will provide a bridge of support and development that prolongs the life and impact of key results by another 3-4 years. There are different avenues here,

Blue Cloud EOSC Node

Blue-Cloud⁴⁸ is developed in the framework of the European Open Science Cloud (EOSC), as a collaborative web-based environment in support of the EU Mission Ocean, enabling

⁴⁷ <https://support.google.com/accounts/answer/12418290?hl=en>

⁴⁸ <https://blue-cloud.org/>

open science. It provides by means of a versatile Virtual Research Environment (VRE) access to computing and storage resources, interoperable tools, and marine data resources. The developments are successfully undertaken by representatives from marine Research Infrastructures, EU initiatives – Copernicus Marine, EMODnet, and EDITO – and from e-infrastructures, such as D4Science (CNR), EGI, and EUDAT. Blue-Cloud has already delivered several V Labs, focusing on multidisciplinary data analytical workflows.

Blue-Cloud has applied successfully for its candidacy to become the Marine thematic node in the EOSC Federation. For this, Blue-Cloud currently is engaged in the EOSC Federation Build-up phase which is coordinated by the EOSC Association⁴⁹. It follows the EOSC Federation Handbook, which serves as a practical guide for organisations that are interested in making their resources available within and across the EOSC Federation by creating and operating an “EOSC Node”, and “enrolling” it as part of the EOSC Federation.

To follow-up the Build-up phase, Blue-Cloud is planning a future and more evolved deployment of the EOSC Marine thematic node, responding to a recent EU Call for Proposals. As part of this process, EU stakeholders such as EU DG MARE, EU DG R&I, and EU DG DEFIS, have requested parties to develop the EOSC Marine thematic node, taking into account the EOSC Federation requirements, but also using the opportunity to represent the interests of EMODnet, Copernicus Marine, and EDITO, which are major leading marine initiatives, towards the EOSC community. This includes establishing a seamless bridging between the e-infrastructures of EDITO and Blue-Cloud, and a bundling of data services as provided via EMODnet and Copernicus Marine in the EDITO Catalogue and those provided by multiple marine Research Infrastructures (RIs) as engaged in Blue-Cloud. The idea is that the EOSC Marine thematic node will provide the EOSC research community opportunities and services for developing new Virtual Labs, which after reaching a maturity level and conforming to EDITO requirements, will be published at the EDITO marketplace.

EMODnet

The European Marine Observation and Data Network⁵⁰ (EMODnet) is the European Commission (EC) *in situ* marine data service of EC DG MARE. EMODnet plays a pivotal role as a trusted source of *in situ* marine environmental and human activities data and data products, serving a diverse user base across various sectors. EMODnet works together with European data management infrastructures such as e.g. SeaDataNet, EurOBIS, and others to gather and make marine data FAIR in 7 thematics (physics, chemistry, geology, bathymetry, biology, seabed habitats, and human activities). These FAIR metadata and data are then used as input for making EMODnet data products, such as European maps, European DTM, and validated harmonised data collections, which are published by a common portal and web services, which are very popular.

⁴⁹ <https://eosc.eu/eosc-about/building-the-eosc-federation/>

⁵⁰ <https://emodnet.ec.europa.eu/en>

Copernicus Marine

The Copernicus Marine Service⁵¹ is the marine component of the Copernicus Programme of the European Union. It provides free, regular and systematic authoritative information on the state of the Blue (physical), White (sea ice) and Green (biogeochemical) ocean, on a global and regional scale. It is funded by the European Commission (EC DG DEFIS) and implemented by Mercator Ocean International. It is designed to serve EU policies and International legal Commitments related to Ocean Governance, to cater for the needs of society at large for global ocean knowledge and to boost the Blue Economy across all **maritime sectors** by providing free-of-charge state-of-the-art ocean data and information.

It provides key inputs that support major EU and **international policies** and initiatives and can contribute to: combating pollution, marine protection, maritime safety and routing, sustainable use of ocean resources, developing renewable marine energy resources, supporting blue growth, climate monitoring, forecasting, and more. It also aims to increase awareness amongst the general public by providing European and global citizens with information about ocean-related issues. Access to Copernicus Marine data products is arranged via the Copernicus Marine Data Store.

EDITO

Over the past several years, the European Union has been working on establishing a core infrastructure of the European Digital Twin Ocean⁵² (EDITO). EDITO offers cutting edge tools to develop digital twins, support science-based decision-making, and ensure maximum impact for research and innovation actions across the key objectives of the EU Mission Ocean & Waters: protect biodiversity, stop marine pollution, and support a sustainable blue economy. The EDITO-Infra and EDITO-Model Lab initiatives are collaboratively developing EDITO. It consists of computational infrastructure and cloud-based data, model and services. The EDITO Model Lab has initiated the development of a modular, high-performance simulation environment, which aims to support relocatable model engines for various environmental processes. These tools aim to offer scalable, ensemble-ready infrastructure for European DTO developers and stakeholders. Complementing this, EDITO Infra provides a federated, interoperable digital infrastructure that aims to integrate the data services of Copernicus Marine, EMODnet, and others into a harmonised access layer. It enables cloud-based data operations and downstream service development, positioning itself as the digital backbone of the EU DTO.

Future perspective

⁵¹ <https://marine.copernicus.eu/>

⁵² <https://www.edito.eu/>

The development of the EOSC Marine thematic node is aiming to bring together the Virtual Research Environments, federated Data Services, various analytical applications, and the computing and storage resources of EDITO and Blue-Cloud and enrolling these in the EOSC Federation. This will provide a versatile and powerful e-infrastructure, backed up by the EU for a long-term perspective, and providing an important space for open science in the marine domain.

This development also provides a great opportunity for synergies with iImagine as the potential of AI services cannot be ignored and is missing in the EOSC Marine thematic node offer. For that purpose, a dialogue is ongoing between the iImagine core team and the Blue-Cloud community for sustaining the iImagine platform and services with computing and storage resources as a component of the Blue-Cloud portfolio of services. This dialogue should be finalised in the coming weeks.

Horizon Europe/FP10/National Funding

To secure fresh funding that will keep iImagine's results alive and evolving, we will continue to monitor and track forthcoming Horizon Europe work programme calls and the early thematic orientations of Framework Programme 10 (FP10). Whenever a suitable call has been identified by a partner, as agreed in the Letter of Intent, they will, in good faith, engage with other partners to set up a consortium to apply for the call. This distributed, opportunity-driven scouting model leverages each partner's disciplinary radar and funding intelligence. By committing to exchange intelligence promptly and to co-develop concept notes on an opt-in basis, the consortium preserves agility, maximises individual initiative and ensures that iImagine's open-source platform, AI services and datasets remain well-positioned for the next wave of EU R&I investments.

Within the 2025 set of calls, some members within the iImagine consortium have identified and pursuing opportunities for future funding. This funding is primarily related to the expansion and adaption of the iImagine AI platform and its underlying technology in the EOSC context. Specifically, this group of members is targeting the following two calls,

1. HORIZON_HORIZON-INFRA-2025-01-EOSC-01 EOSC Nodes with federating capabilities for the EOSC Federation⁵³: This call focuses on developing and expanding the EOSC federation through a network of nodes. Within the framework of this call, the aim is for the Blue-Cloud EOSC Node to become a federator in the EOSC Federation, with the inclusion of the iImagine AI platform as one of its federated services.
2. HORIZON_HORIZON-INFRA-2025-01-EOSC-03 Advancing AI-readiness and Machine-Actionability in the EOSC Ecosystem⁵⁴: Within this call, the aim is to support the AI4OS technology (on which the iImagine AI platform is based) to

⁵³ https://cordis.europa.eu/programme/id/HORIZON_HORIZON-INFRA-2025-01-EOSC-01

⁵⁴ https://cordis.europa.eu/programme/id/HORIZON_HORIZON-INFRA-2025-01-EOSC-03

become the generic platform for AI model development and delivery. This will broaden its support to additional disciplines beside aquatic sciences.

Not just Horizon Europe or FP10 funding, National grants may also help sustain and further develop the results. For example, UC8 has already secured funding for a follow-up project by the French National Research Agency⁵⁵. This funding allows the use case to take a significant step forward in terms of maturation, using the iImagine platform.

OrbitalEOS

OrbitalEOS is one of the key partners contributing to the Oil Spill Detection service. OrbitalEOS uses satellite technologies and advanced AI algorithms to simplify difficult jobs. One of their key products is the EOS Viewer, which is the first comprehensive cloud AI solution, providing detection, quantification, and forecasting of oil spills at sea. EOS Viewer offers unprecedented capabilities in terms of coverage and frequency of monitoring. Their proprietary AI algorithm analyses radar and optical imagery from Earth Observation satellites, promoting proactive and cost-efficient surveillance of assets in remote locations.

OrbitalEOS is a fully sustained SME supported through commercial contracts with local and regional governments, monitoring agencies, NGOs and other private companies for proactive surveillance and also for forecasting of oil spill drift. The work done by OrbitalEOS in the context of the iImagine project furthers their competitive advantage in the market, letting them leverage their capabilities for further growth.

Future Development and Roadmap

Exploitation is not just about preserving what exists, but also about evolving it to meet future needs and demands. We outline a **roadmap of future development** for iImagine outcomes that exploitation actors (partners, community, or new projects) are expected to carry forward:

⁵⁵ <https://anr.fr/Projet-ANR-24-CEO4-0345>

Table 7 Future Development Roadmap for Services

Service	Key development actions
UC1 – Marine litter detection	<ol style="list-style-type: none"> 1. Broaden training data with images from multiple climate zones, shore types and litter densities to boost geographic generalisation. 2. Test alternative AI architectures (e.g. instance segmentation, object detection ensembles) to capture a finer waste hierarchy. 3. Introduce standard waste-category labels and re-label core datasets accordingly for richer monitoring outputs. 4. Publish updated training scripts & fine-tune guidelines so external users can adapt the model to local datasets. 5. Benchmark new models on a comprehensive validation suite and document accuracy/robustness gains.
UC2 – ZooProcess / EcoTaxa pipeline	<ol style="list-style-type: none"> 1. Stabilise all “new” ZooProcess stages so the modern and legacy apps interoperate without data loss. 2. Extend the new front-end to cover project creation, metadata QC, scanner control and automatic upload to EcoTaxa. 3. Introduce full unit-test coverage to catch regressions and support continuous integration. 4. Streamline UI/UX and storage formats for cleaner workflows and faster processing. 5. Phase out legacy components once feature parity is achieved, completing the migration.
UC3s – Ecosystem Monitoring at EMSO Sites	<p>Smartbay</p> <ol style="list-style-type: none"> 1. Continue to enhance the training datasets. 2. Develop the AI models further. 3. Apply the experience from the iMagine project to expand the usage of AI Image analysis in Marine Insitute. <p>Ifremer</p> <ol style="list-style-type: none"> 1. Apply the pre-processing pipeline on different data types to be used for AI-model training (e.g. seafloor litter). 2. Improve the training dataset 3. Train the developed model on additional classes (deep-sea species) for automatic processing of images collected by cameras at observatories underwater sites 4. Identifying and analysing fauna and habitats for deep ecosystem monitoring purposes.

UC4 – Oil-spill forecasting service	<ol style="list-style-type: none"> 1. Add map-based event definition and interactive dashboards for intuitive scenario setup and result visualisation. 2. Embed ML modules inside the Lagrangian core to create a hybrid physics, ML model (better diffusion, weathering, beaching). 3. Use data-driven approaches to parameterise sub-grid processes such as sinking rates or turbulent diffusion. 4. Automate real-time data ingestion pipelines for winds, currents and re-analysis fields. 5. Optimise storage and compute footprints so large-scale simulations remain cost-effective.
UC5 – FlowCAM plankton analysis	<ol style="list-style-type: none"> 1. Generalise models to support diverse plankton datasets, imaging devices and ecological settings. 2. Embed an integrated labelling tool to speed up annotation and kick-start new training sets. 3. Develop comprehensive docs & tutorials covering installation, retraining and workflow integration. 4. Run an adoption & feedback programme offering hands-on support to early adopters. 5. Iteratively fine-tune models with user-supplied data to raise accuracy.
UC6 – Underwater-noise vessel-distance predictor	<ol style="list-style-type: none"> 1. Boost robustness and interpretability for challenging acoustic conditions and “dark” (AIS-silent) vessels. 2. Extend output metrics to estimate vessel type, speed and engine characteristics, not just distance. 3. Model multiple contributing vessels simultaneously (e.g. closest two or three ships). 4. Generalise models with datasets from deeper and diverse marine environments beyond the Belgian North Sea. 5. Create batch-processing pipelines & APIs for large acoustic archives and operational deployment.
UC7 – Beach-wrack / rip-current & shoreline suite	<ol style="list-style-type: none"> 1. Retrain models with expanded, multi-site datasets via new external collaborations. 2. Produce ready-to-use data products (e.g. beach-wrack time series) for end-user applications. 3. Implement near-real-time inference for modules such as rip-current detection. 4. Automate shoreline extraction to replace manual workflows in coastal monitoring. 5. Embed matured models in operational frameworks within partner institutes and related projects.

UC8 – Diatom detection & classification	<ol style="list-style-type: none"> 1. Re-train detection and classification models on larger real-world datasets and pipeline them sequentially. 2. Implement hierarchical/probabilistic classification (per PhD research) for finer taxonomy. 3. Replace the current Gradio UI with a tailored DEEPaaS application to simplify parameters and preprocessing. 4. Connect platform APIs to user-friendly GUIs used by non-IT diatom experts. 5. Leverage follow-up ANR funding to mature algorithms and validate them in production studies.
iMagine AI platform	<ol style="list-style-type: none"> 1. Integration with additional resource and data providers. 2. Improvements in the resource quota and accounting management. 3. Integration with energy monitoring tools and energy consumption reporting. 4. Corrective actions, including bug fixing and security related issues.

Impact Analysis

The Key Impact Pathways (KIPs) laid out in the European Commission’s Evidence Framework on Monitoring and Evaluation of Horizon Europe⁵⁶ are designed for programme-level monitoring. These pathways, KIP 1–3 (new knowledge, human capital, open science), KIP 4–6 (policy alignment, mission benefits, societal uptake) and KIP 7–9 (innovation-based growth, jobs, leveraged investment), span *scientific*, *societal* and *technological-economic* dimensions.

While these indicators are not intended to grade individual projects, iMagine has adopted the KIP logic model as a structuring lens for its impact storytelling. All this has been compiled into a standalone report, which can be found on Zenodo⁵⁷.

Conclusions

The iMagine project has delivered a rich set of results from advanced AI services and a cloud platform to vast image datasets and best-practice knowledge. These results are all aimed at revolutionising aquatic science through open AI solutions. This final Innovation

⁵⁶ <https://research-and-innovation.ec.europa.eu/system/files/2023-05/swd-2023-132-monitoring-evaluation-he.pdf>

⁵⁷ <https://doi.org/10.5281/zenodo.15574352>

Management & Exploitation Plan details how those results have been and will be leveraged to maximise scientific, economic, and societal impact beyond the project's end.

Through a combination of open science practices, strategic partnerships, and early stakeholder engagement, iImagine has positioned its outputs on a path of continued exploitation. KERs have clear owners, defined target communities, and mechanisms (technical and organisational) to remain available and up-to-date. The adoption of open licensing and alignment with standards has removed barriers to uptake, enabling integration of iImagine's innovations into external platforms like EOSC and facilitating reuse by anyone interested.

We conclude that the outlook for iImagine's long-term impact is very positive. Concretely, we expect in the next few years to see:

1. Expanded use of iImagine tools: More researchers and institutions are using the AI services for aquatic monitoring, as evidenced by growing user metrics and references in publications.
2. Integration into programs and policies: e.g., our tools contributing to initiatives like the EU Mission on Oceans or being recommended in marine monitoring protocols.
3. Knowledge dissemination: the best practices and lessons from iImagine informing standards and guiding other domains, as our approach to open AI for science is generalised beyond aquatic use cases.
4. Socio-economic benefits: SMEs leveraging our results for services (creating jobs, revenue) and societal benefit through improved environmental management (e.g., quicker detection of pollution events, better biodiversity assessments).

In closing, while the funded period of iImagine is ending, the exploitation activities outlined will help the project's outputs live independently and continue to grow.

ANNEX 1: Letter of Intent Draft

Letter of Intent

Relating to Continued Support and Collaboration around iImagine Results after Project Completion

Undertaken by: [Full legal name of partner], established in [address], [country], VAT number [VAT if applicable], hereinafter referred to as “the Partner”.

Herein validly represented by [Name and position of representative].

Concerning the following,

- The Partner has participated in the iImagine project (www.imagine-ai.eu), which has received funding from the European Union’s Horizon Europe research and innovation programme under Grant Agreement No. 101058625.
- The iImagine project has developed an AI platform and a portfolio of mature and prototype thematic AI services along with labelled datasets.
- The Partner considers the results of the iImagine project as valuable scientific and technological assets with long-term potential.

Declaration of Intent

The Partner hereby expresses its fair and non-binding intention to:

[Partner specific]

-

[Common to everyone]

- Where possible, promote the visibility, accessibility, and adoption of iImagine results.
- Remain engaged with other iImagine partners and the broader community in good faith, and contribute to identifying new opportunities for cooperation, joint proposals, or follow-up projects, including the formation of new consortia.

Nature of this Letter

This Letter of Intent is a good-faith expression of the Partner’s willingness to continue the collaboration and support outlined above. It is not legally binding, does not establish any formal consortium, joint venture, or agency relationship, and does not create any obligation concerning intellectual property, exclusivity, or funding.

Any specific commitments or collaborations shall be subject to separate, formal agreements between the relevant parties.

Duration

The Partner intends to act in accordance with this Letter of Intent for a period of up to two (2) years from the signing date unless otherwise superseded by subsequent agreements or collaborations.

Applicable Law

This Letter of Intent shall be governed by the laws of the country in which the Partner is legally established.

Signed on [date], in [city], by:

[Name of representative]

[Position]

[Signature]