



iImagine

D2.6 Business Model Analysis and Sustainability Plan

iImagine Deliverable D2.6

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Abstract

This deliverable provides an overview of the plan for carrying out Business Modelling and Sustainability Analysis for the various services developed in iImagine.



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Acronyms

(EU) MSFD	EU Marine Strategy Framework Directive
AI	Artificial Intelligence
AI4EOSC	(project) Artificial Intelligence for the European Open Science Cloud
AI4EU	(project) AI on-demand platform to support research excellence in Europe
AloD	AI on Demand
API	Application Programming Interface
ASB	Activity and Service Board
BODC	British Oceanographic Data Centre
CA	Consortium Agreement
CBIR	Content-Based Image Retrieval
CC	Competence Centre
CI/CD	Continuous Integration and Continuous Delivery/Continuous Deployment
CNN	Convolutional Neural Network
CPU	Central Processing Unit
DevOps	Development and Operations
DL	Deep Learning
DOI	Digital Object Identifier
DSDM	Dynamic System Development Method
DwCA (DwC-A)	Darwin Core Archive
EOSC	European Open Science Cloud
FAIR	Findable Accessible Interoperable Reusable
ITSM	IT Service Management
FSS	Fraction Skill Score

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GA	General Assembly
GAN	Generative Adversarial Model
GIS	Geographical Information System
GPU	Graphics Processing Unit
GUI	Graphical User Interface
HPC	High-Performance Cluster
IEG	Innovation and Exploitation Group
IPR	Intellectual Property
KER	Key Exploitable Result
KPI	Key Performance Indicators
mAP	mean Average Precision
ML	Machine Learning
MVP	Minimum Viable Product
NGO	Non-governmental organisation
PMB	Project Management Board
QC	Quality Control
RI	Research Infrastructures
SEAM	Stakeholder Engagement Assessment Matrix
TB	Terabyte
UAV	Unmanned Aerial Vehicle
UC	Use Case
US	User Story

Introduction

iImagine has the overall objective to deploy, operate, validate, and promote a dedicated iImagine AI framework and platform. The platform, connected to the EOOSC and AIoD, 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 of relevance 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** will be 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 will be 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 – will be 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 Business Modelling and Sustainability in the iImagine project fall under task 2.1 with the main objectives:

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 document provides an overview of the business modelling and sustainability activities planned for the mature use cases of the iImagine project. A list of mature use cases is presented in the table below. This document builds on the work presented in D2.5 Innovation Management and Exploitation Updated Plan. The document provides output

from two such workshops while the output from the later planned workshops will be included in the D2.9 Final Innovation Management and Exploitation Plan due at M36.

Table 1 – List of mature use cases

Use case	Abbreviation	Short Description
Use case 1	UC1	Aquatic Litter monitoring system using drones
Use case 2	UC2	Taxonomic identification of zooplankton using ZooScan
Use case 3	UC3a (EMSO-Azores)	The aim is to establish an integrated service on the iMagine platform for the automatic processing of video imagery, enabling the identification and analysis of relevant images for ecosystem monitoring.
	UC3o (EMSO-Obsea)	
	UC3s (EMSO-SmartBay)	
Use case 4	UC4	Oil spill detection from satellite images
Use case 5	UC5	Taxonomic identification of phytoplankton using Flowcam images

Structure of the document

Chapter 2 of this document provides the requirements as collected from each of the use cases related to Business Modelling and Sustainability. **Chapter 3** provides an update on the collaboration of the iMagine project with various initiatives. **Chapter 4** provides the output of the Value Proposition Workshop performed for use case 2 and **Chapter 5** provides the output from the first Sustainability workshop. And finally, **Chapter 6** provides the sustainability mechanisms.

Business Modelling and Sustainability Analysis Requirements

Task 2.1 had envisioned organised business modelling and sustainability workshop(s) for all the use cases involved in the project. Considering the nature of these use cases and the fact that their services will not be commercialised, T2.1 looked at the concept of Business Modelling more broadly. Therefore, the five mature use cases were asked to delineate their requirements so that a more useful set of workshops could be organised benefiting them. The requirements collected from the use cases and workshops proposed to meet these requirements are listed in the table below. See the previous chapter for more list of use cases.

Table 2 – Requirements and Workshop Designs for Business Model and Sustainability Analysis

	Requirements	Workshop Design
All use cases	Sustainability beyond the project	2x Sustainability Workshops – Q3 2024 and Q2 2025
UC1	Expanding the user base. Understanding additional factors/information that is missing for potential users	Value Proposition Canvas
UC2	Convince users to move away from existing traditional methods.	Value Proposition Canvas workshop (Completed in May 2024)
UC3a, UC3o, UC3s	Expanding the user base. Increase the impact of the produced data/services.	Market Research
UC4	Improving the user experience. Expanding the user base.	Market Research Usability Testing
UC5	Understand what could be missing for potential users	Customer Journey Mapping

Update on Collaboration with Various Initiatives

This section provides an overview of the collaboration of the iMagine project with the various initiatives and projects. These initiatives and projects are in some cases avenues of both exploitation of iMagine's outputs and possible opportunities for sustaining them.

EOSC

The EOSC landscape has changed dramatically in the last year. The EOSC Portal, which is where researchers could find services onboarded to EOSC, is no longer available. It is being replaced by the EOSC Federation of Nodes¹. The EOSC Federation is re-developed in the form of multiple EOSC Nodes that are interconnected and can collaborate to share and manage scientific data, knowledge, and resources within and across thematic and geographical research communities.

The EOSC Nodes will be entry points for users to the EOSC Federation, with each node offering its own and possibly third-party services, including data reposing and accessing services. The EOSC EU Node² is the first of the EOSC Federation. However, detailed information on how one can contribute to the EOSC EU Node and Rule of Participation is not yet available.

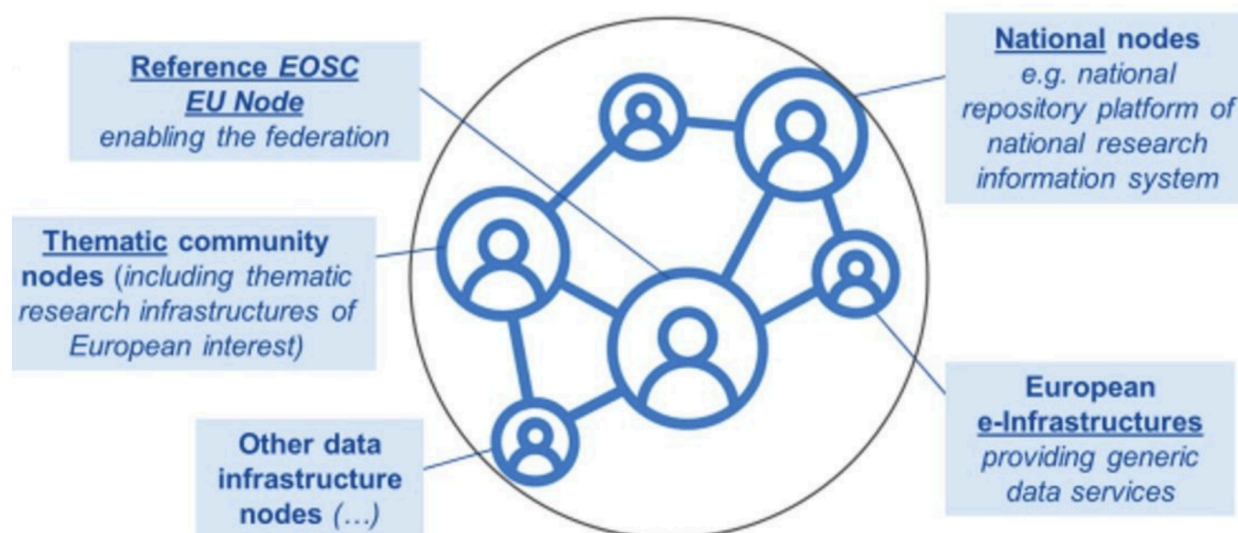


Figure 1: EOSC Federation of Nodes

Discussions over the individual EOSC Nodes that will complement the EOSC EU Node to initiate the formation of the EOSC Federation are still ongoing. However, the Tripartite

¹ <https://eosc.eu/building-the-eosc-federation/>

² <https://open-science-cloud.ec.europa.eu/>

Governance of EOSC recently launched a questionnaire³ to gauge the scale and scope of general interest and readiness for the build-up phase of the EOSC Federation. Interested parties were invited to reply to the questionnaire as the first step in their eligibility to contribute to a testbed of potential EOSC Nodes representing the different stakeholders involved in the research communities of Europe. Both EGI and Blue Cloud have replied to the questionnaire. EGI focuses on providing a node with core services supporting computing and storing, while Blue-Cloud aims for a Blue node as a marine thematic ecosystem of application services. The results of the questionnaire are not available at the time of writing. However, iImagine might in principle benefit from a combination of both nodes as suggested by EGI and Blue-Cloud, also considering that EGI is already supporting Blue-Cloud with computing and storage services.

Update on EOSC Financial Sustainability Task Force

The objective of the EOSC Financial Sustainability Task Force was to produce a proposal for long-term financial sustainability of the main building blocks of EOSC: EOSC-Core, EOSC-Exchange and the Federation of Data & Data Services as defined in the FAIR Lady report “Solutions for a Sustainable EOSC”⁴. The final report – Recommendations for a financially sustainable post-2027 EOSC – of the task force was published in April 2024⁵.

In the section “Key Principles for EOSC Financial Sustainability”, the report concludes that brokered not-for-profit services, including horizontal and thematic services as part of EOSC Exchange, will constitute the majority of services and the true marketplace of EOSC. This is where the thousands of EOSC participants will offer services to each other. The report also notes that EOSC Marketplace needs to include mechanisms that will not only allow researchers to access these services but also cost recovery mechanisms for service providers, both for services that are “free at the point of use” for researchers as well as for those that require researchers to pay. These mechanisms should encourage service providers to join the marketplace and provide the best quality service possible at the best price.

More importantly, the report notes that the usage of these services will ***not be centrally financed on the European level but via national or institutional funds***. Therefore, other avenues would have to be explored to sustain the various services developed as part of the iImagine project.

³ <https://eosc.eu/eosc-about/building-the-eosc-federation/questionnaire-for-parties-interested-in-contributing-to-the-build-up-phase-of-the-eosc-federation/>

⁴ <https://op.europa.eu/en/publication-detail/-/publication/581d82a4-2ed6-11eb-b27b-01aa75ed71a1>

⁵ <https://zenodo.org/doi/10.5281/zenodo.11317575>

AIoD

The AI-on-Demand (AIoD)⁶ platform and ecosystem is an initiative of the European Commission (EC) aimed at fostering collaboration and innovation in the field of AI across Europe. Its primary goal is to create a sustainable digital ecosystem that connects AI research and industry, facilitating easy access to trustworthy AI resources, tools, and services.

The platform originated with a Horizon 2020 project – AI4EU – a three-year project finished at the end of 2021. It has since evolved under an ongoing Horizon Europe project, AI4Europe, which focuses mainly on the AI research community. In parallel, the recently started Digital Europe project, DeployAI, targets the AI innovation community, particularly SMEs and public administrations.

The AIoD platform is expected to operate similarly to EOSC, with multiple interconnected AIoD nodes working together to share and manage AI assets⁷. While discussions regarding these individual nodes and rules of participation are still ongoing, and a legal entity has not been established yet, the platform represents a significant opportunity for projects like iImagine to expand their user base.

In preparation, iImagine had already started uploading content – such as project information and open calls – on the former AIoD community platform. The project is also actively tracking the development of the AIoD catalogue to onboard project assets, ranging from datasets to use cases and become part of this community, ensuring both visibility and potential exploitation.

Zenodo

The iImagine community on Zenodo has been selected to participate in a pilot, created within the Horizon-ZEN project, of establishing an Open repository for EU-funded research collecting research outputs from Horizon Europe, Euratom and earlier Framework Programmes. Thanks to this pilot, iImagine could request the customisation of the “dataset” metadata fields for a more accurate description of the data included and all additional information. The development of this adaptation of Zenodo for an iImagine FAIR repository for image data collections is well underway and its launch is currently planned for early 2025.

Other H2020 and Horizon Europe Projects

AI4EOSC: AI4EOSC⁸ will deliver an enhanced set of services for the development of Artificial Intelligence (AI), Machine Learning (ML) and Deep Learning (DL) models and

⁶ <https://aiod.eu/>

⁷ <https://mylibrary.aiod.eu/marketplace>

⁸ <https://ai4eosc.eu/>

applications for the European Open Science Cloud (EOSC). The AI4EOSC Platform, a cutting-edge software ecosystem designed to enhance the development and deployment of AI/ML/DL models and applications, is the underlying technology of the iImagine AI platform. The requirements from the iImagine use cases for (new) features related to the platform are collected and the technological developments of these features are carried out in the AI4EOSC project.

ANERIS: Part of the INFRA-2022-TECH-01-01 call, ANERIS aims to develop the next generation of scientific instrumentation tools and methods for sensing marine-life⁹. So, there exists a strong synergy between the two projects even though the general TRL level of ANERIS results is lower than those of iImagine. Innovation Management and Exploitation activities in both projects are led by the same Innovation Manager, who will act as a liaison between the two projects. The Project Management teams and also the communication and dissemination teams of the projects have had coordination meetings amongst them. Following those meetings, it was agreed to (1) Utilise the communication channels of one project to showcase news from another to double the reach, (2) ANERIS will be present at the EGI Conference, and (3) iImagine will be present at the ANERIS project meeting in November 2024 and showcase its solutions. This meeting will also be used to discuss further collaboration between the two projects.

Blue-Cloud 2026: Blue-Cloud 2026 is the continuation of the previous Blue-Cloud project, aiming at further evolving the Blue-Cloud platform into a Federated European Ecosystem to deliver FAIR & Open data and analytical services. In the framework of Blue-Cloud 2026, strong liaison has been established at the communications and events management level. Two workshops – the satellite event of the Ocean Decade Conference and the session at the European Maritime Day, respectively, in April and May 2024, helped set the ground for further collaboration in the interest of the aquatic science community. Another area of collaboration was to test the execution of iImagine services in the d4science platform¹⁰. Following the instructions provided by d4science¹¹, an application for the iImagine-AI platform was deployed and executed successfully on the d4science platform. As Blue-Cloud is building an ecosystem of analytical services for the aquatic domain and is joined by most leading marine RIs and EU initiatives such as EMODnet and CMEMS, it is interested in building a two-way bridge with iImagine, both for its platform and use cases.

AI4Life: The goal of AI4Life¹² is to radically reduce the disparity between the theoretical applicability and the practical use in life sciences of state-of-the-art AI-based image

⁹ <https://aneris.eu/>

¹⁰ <https://www.d4science.org/about-us> D4Science is a Hybrid Data Infrastructure combining over 500 software components and integrating data from more than 50 different data providers into a coherent and managed system of hardware, software, and data resources. As an infrastructure, D4Science offers a rich array of services to its end users directly or to Infrastructure Managers and Service Providers.

¹¹ <https://ccp.cloud.d4science.org/docs/usermanual/index.html#ui-widgets>

¹² <https://ai4life.eurobioimaging.eu/>

analysis methods. The collaboration started in mid-2023, when iMagine was invited to give a keynote at the AI4Life General Assembly, followed up with several other meetings at a technical level between the AI4EOSC/AI4OS the AI4Life technical and development teams. As a first step, technical integration and federation activities have been carried out, 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.

Value Proposition Workshop – Use Case 2

Designing good Value Propositions can help ensure that a product or service is positioned around the customer's values and needs. The value proposition workshop for use case 2 took place on 7th May 2024. Two users of the ZooScan attended the workshop and provided the inputs.

Customer Persona

Customer personas (or buyer personas) are fictional, composite characters representing a segment of your users. The following section provides a customer persona for ZooScan. This fictional persona is based on the two users who attended the workshop and on the desk research of other users.

Name: Dr. Amanda Planktonis

Role: Senior Plankton Researcher

Background: Dr. Planktonis has a deep passion for marine biology, focusing on plankton ecology. She holds a PhD in Marine Biology and has extensive experience in zooplankton taxonomy and marine ecosystems. Her work revolves around understanding the role of plankton in the global marine environment.

Personality

- **Passionate:** Driven by a deep love for the ocean and its microscopic inhabitants, she is passionate about every aspect of her work.
- **Innovative:** Constantly seeks out new methods and technologies to improve plankton research.
- **Team-Oriented:** Believes in the power of collaboration and is committed to fostering a supportive and inclusive work environment.
- **Meticulous:** Pays great attention to detail, particularly in the identification and classification of plankton species.

Motivations

- **Scientific Contribution:** Motivated by the desire to make significant contributions to marine science, particularly in understanding the role of plankton in global ecosystems.
- **Innovation:** Thrives on being at the cutting edge of technological advancements in marine biology.
- **Conservation:** Driven by a commitment to protect marine ecosystems and address the challenges posed by climate change.

Goals

- **Scientific Impact:** To publish groundbreaking research that advances the understanding of plankton ecosystems and their role in global climate regulation.
- **Technological Advancement:** To develop new tools and methodologies that revolutionize plankton research.
- **Education and Outreach:** To inspire the next generation of marine biologists through mentorship and public outreach initiatives.

Vision: Dr. Planktonis envisions a world where plankton research significantly contributes to understanding and mitigating the impacts of climate change, ensuring the health of marine ecosystems for future generations.

Customer Profile

This section is dedicated to understanding the target customer in detail. It includes three key elements:

- **Customer Jobs:** Describes the tasks, problems, or needs that customers are trying to address. These can be functional, social, or emotional jobs that the customer needs to get done.
- **Pains:** Identifies the negative experiences, emotions, and risks that customers encounter while trying to get their jobs done. This can include obstacles, challenges, and any undesirable outcomes they wish to avoid.
- **Gains:** Highlights the positive outcomes, benefits, and aspirations that customers seek. This can include desired functionalities, savings, and improvements in their situation or status.

Customer Jobs

1. **Batch Processing:** Handle large campaigns by processing multiple plankton samples simultaneously.
2. **Metadata Management:** Accurately enter metadata for all samples, ensuring high-quality data that meets format and length requirements.
3. **Quality Control:** Conduct rigorous checks at every stage, from metadata accuracy to sample acquisition and processing, to ensure data integrity.
4. **Error Handling:** Identify and correct errors in image processing.
5. **Image Separation of Overlapping Plankton:** This involves accurately segmenting each organism within the image.
6. **Processing images:** for each individually segmented organism, extract it from the background and measure various quantitative metrics on it (size, opacity, etc.)

7. Validating Results: Validating the results (handling of metadata, processing of images, upload to EcoTaxa) to ensure they meet research standards.

Pains

1. Tedious Image Handling: Moving images with multiple organisms is cumbersome; the process is prone to errors and is time-consuming.
2. Inflexible Separation Tools: The current tool only allows drawing straight lines, with no option to correct mistakes easily, leading to frustration.
3. Software Navigation Issues: Software buttons often disappear when zooming in/out, causing workflow disruptions.
4. Complex Software Integration: Switching between different software tools in a strict order is confusing and inefficient.
5. Slow Processing: Processing two samples per day is slow, limiting productivity.
6. Naming Issues: Mistakes in sample naming require manual correction across multiple files, leading to wasted time.
7. Lack of Feedback: No feedback during scanning about failures or issues with object counts.

Gains

1. Improved Workflow Efficiency: Simplify software integration and navigation, allowing for faster processing and reducing user frustration.
2. Enhanced Tool Functionality: Introduce more flexible tools for image separation and error correction, such as the ability to draw curved lines and undo specific actions.
3. Real-Time Feedback: Implement real-time error checks during scanning and processing to catch issues immediately, reducing rework.
4. Automation and Accuracy: Automate metadata entry and quality control steps to minimize human error and free up more time for research.
5. Scalable Processing: Increase the number of samples processed per day to accelerate research timelines.
6. User-Friendly Interface: Design a more intuitive interface that reduces complexity for end-users, making the tool accessible and less intimidating.

Value Proposition

Speed Up Your Research: The new ZooProcess v10 drastically reduces the time it takes to process plankton images, allowing you to analyze more samples faster and focus on what matters—your research.

Accuracy through AI: With advanced AI-driven image classification and panoptic segmentation, you can now automatically separate overlapping plankton organisms, minimizing manual errors and ensuring high-quality data for your studies.

Seamless Integration: Enjoy a streamlined workflow from metadata entry to data formatting, with everything automatically uploaded to EcoTaxa for easy management and validation.

Enhanced Quality Control: Built-in checks throughout the process ensure your data is accurate and reliable, reducing the need for rework and improving research outcomes.

More Time for Innovation: By automating routine tasks, ZooProcess v10 frees up more of your time to dive deeper into taxonomic analysis and experimental projects, pushing the boundaries of marine biology research.

Promoting the service to the users

The previous section provided a list of updated Value Propositions that can be used to promote the ZooProcess service to the users. Based on the interviews with the users, the service should strongly emphasise its time-saving capabilities along with the simplification it offers compared to the current process to promote its adoption among the users. In addition, the service is available at no cost to the end users which should remove any potential financial barriers for adoption by research institutions and individual researchers. Finally, the messaging of the service should lean onto the fact that it frees up the time for researchers from grunt work to do valuable research.

To create a strong online presence, a dedicated page for the service has been created on the iMagine website¹³. This page will act as the landing page for the users. The page will be further enhanced by including guides, tutorials, and user testimonials. The ZooScan team will provide online training sessions to help users quickly get up to speed with the new tool, ensuring a smooth transition from previous methods. These live demos and interactive sessions where potential users can see the time-saving benefits and improved data accuracy firsthand will be critical. Along with that, comprehensive documentation will make it easy for new users to start using the service without a steep learning curve.

In addition to all this, T2.1 and T2.2 will explore the possibilities of collecting user feedback and testimonials which can be leveraged to promote adoption.

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

Sustainability Workshop – All Mature Services

As part of our ongoing commitment to ensuring the long-term impact and viability of the mature aquatic services developed within our project, T2.1 organised a dedicated workshop focused on medium-term sustainability. This workshop aimed to collaboratively assess and plan for the continued operation and success of these services over the next 5–7 years. The primary goal of this workshop was to identify and address the critical factors necessary to sustain these services, ensuring that they continue to meet user needs and deliver value well into the future.

The workshop was designed around the following questions,

1. What does sustainability look like in your service? Think about the number of users served, jobs completed, growth rate per year, improvements, etc..
Describe a best-case scenario and a bare minimum scenario. Provide actual numbers as much as possible; Make estimations grounded in reality.
2. What is the vision for the service beyond the 5–7 year timeframe?
3. What are the major risks that could threaten the sustainability of these services in the medium term?
4. What are the regulatory changes expected in the next 5–7 years that may affect the services?
5. What metrics are in place to measure the success and impact of the services over time?
6. How do we collect feedback from users and stakeholders? How is this feedback used to improve the service?
7. What existing or potential partnerships could strengthen the sustainability of the services?
8. What resources (financial, human, technological) are currently needed to keep the service operational? Consider both Best case and Bare minimum scenarios; Provide numbers per year; Provide human costs in FTE per year; Also provide FTE costs per year.
9. What are the key dependencies for the services to be available? Things without which the service cannot operate.
10. Are there opportunities to reduce costs or increase efficiency?
11. Are there any funding sources for the services that you can tap into? Are these sources secure for the next 5–7 years? If applicable, what revenue streams exist or could be developed to support these services?

Summary

This deliverable captures the key insights, discussions, and outcomes of the workshop, providing a strategic framework for sustaining the project's services and ensuring their long-term success.

All the use cases have expressed a strong interest in continuing to deliver the services that they have developed to both internal and external users. Moreover, there is also a keen inclination to continue to develop these services to test new AI models and to incorporate feedback that may be received from the users.

From a sustainability perspective, all the use cases at the very least run a local instance for a handful of local users. Even in this scenario, the model and code of the services are available as open source for external users to run their instance ensuring exploitation. However, to run an instance for hundreds of users would require,

1. Access to computing infrastructure resources
2. Personnel to maintain the service
3. Personnel to develop the service

The following table documents the requirements of the use cases to deliver the services in the coming 5-7 years to external users in the Best Case Scenario (deliver, develop, improve and maintain) and in the Bare Minimum Scenario (deliver and maintain). It is important to note that these numbers may change in the coming months as the use cases deliver their services to users.

Table 3 - Human and Technological Resource Requirement for delivering the services

	Best Case Scenario		Bare Minimum Scenario	
	Human	Technological	Human	Technological
UC1	1 FTE for maintenance and to update and improve the software	1 GPU 1 CPU	0.25 FTE for maintenance and to update and improve the software	Local CPU
UC2	0.1 FTE for maintenance 0.25FTE to update and improve the software	1 CPU (50% capacity)	0.25FTE to update and improve the software	N/A
UC3a	1 FTE for maintenance and to update and improve the software	1 GPU 1 CPU Disk space	0.25 FTE for maintenance	Local GPU and CPU

UC3o	2 FTE for maintenance and to update and improve the software	2 GPUs CPUs Disk Space	0.5 FTE for maintenance	1 GPU
UC3s	2 FTE for maintenance and to update and improve the software	2 GPUs CPUs Disk Space	0.5 FTE for maintenance	1 GPU
UC4	1 FTE for ensuring that data is being downloaded and used correctly. 1 FTE working on the solution to create a full AI oil spill forecast	4 CPUs	0.25 FTE for maintenance	1 CPU
UC5	0.5 FTE for continuous data provision and maintenance code	4 CPUs 5GB disk space	0.25 FTE for data provision and code maintenance	1 CPUs 10 GB disk space

Based on the following mechanisms and collaboration were identified as critical for achieving sustainability,

1. Collaboration with infrastructure providers
2. Collaboration with Research Infrastructures
3. Future Horizon Europe calls
4. Partnership with the private sector

These mechanisms are discussed in more detail in the chapter below.

Sustainability Mechanisms

This section discusses the various mechanisms through which the sustainability of the services is planned to be achieved. Based on the output of the sustainability workshop, the project will explore all these mechanisms to enable sustainability. The eventual sustainability of iImagine services may come from a combination of these mechanisms:

Infrastructure Provisioning – Partnerships

A key requirement for delivering AI services to users would be the availability of a physical infrastructure. A certain amount of CPU, GPU and storage would need to be available even if the services are to be provided to users in inference mode only. These numbers would only increase if user growth is taken into account and if the services need to be developed further.

The infrastructure providers in the project consortium and additional ones from the EGI Federation¹⁴ could fulfil this requirement. EGI Foundation will facilitate this matchmaking taking into account both the requirements of the services and the national and institutional priorities of the providers. The collaboration will then be sealed with a Service Level Agreement. Partnership with Blue-Cloud is of crucial importance here, given that both iImagine and Blue-Cloud include cloud providers that consider aquatic sciences as a key discipline/domain to serve.

Platform provisioning – Projects/Virtual Access

The use cases of the project rely on a common software service platform consisting of AI4OS and OSCAR. Both of these technologies are currently supported by a stream of EC-funded projects. Some of these projects are running longer than iImagine, so the technologies are to be sustained at least for approx. one year after iImagine. Longer-term sustainability will require new funding, which is expected in the form of future projects, and new funding streams (e.g. Virtual/Remote Access) to be available under the EOSC framework (to the EGI and Blue-Cloud Nodes).

Thematic services – Research Infrastructures/P4U

The primary customers for most of the Thematic application services of iImagine are Research Infrastructures that work in the aquatic/marine sciences domain. The European Commission defines RIs as 'facilities that provide resources and services for research communities to conduct research and foster innovation'. RIs represent the most logical place for the iImagine thematic services, both from an exploitation and sustainability point of view. A list of RIs related to the mature services is presented below,

¹⁴ <https://www.egi.eu/egi-federation/>

Table 4 – List of Research Infrastructures (RIs) related to the iMagine use cases.

Use cases	Related RIs
UC1 Aquatic Litter Drones	SeaDataNet;
UC2 Zooscan – EcoTaxa pipeline	Lifewatch; EMBRC
UC3 Ecosystem monitoring at EMSO sites	EMSO; LifeWatch; JERICO; EuroArgo; EMBRC
UC4 Oil Spill Detection	JERICO; LifeWatch; EMSO;
UC5 Flowcam phytoplankton identification	LifeWatch; JERICO

The project is already liaising with these RIs (some are beneficiaries in the consortium), and this liaison work will intensify in the next year to secure potential sustainability pathways for the services based on the requirements collected from the service.

A smaller number of the Thematic Services (UC2, UC4) have the potential to serve customers from industry or public authorities and thus could attract pay-for-use funding. The ZooScan instrument which provides the samples to be tested with the UC2 service is commercially available whereas the UC4 has had previous collaborations with oil spill risk management companies to run simulations. UC2 will explore the possibility of receiving direct funding from the instrument manufacturer while UC4 will also explore receiving funding from enterprises as in the past.

Competence Centre/Projects

The competence centre, the advisory and support group for the use cases is a key result that would deserve sustainability irrespective of the other key results. The most reasonable sustainability path for this is through future R&D projects, where the competence centre can be closely linked to use cases/communities/applications that need their support. The draft for the next set of calls in 2025 is yet to be published, however, T2.1 and the ASB will keep a close eye on the developments in this space and flag potentially valuable calls to the consortium. The project is also exploring applying for calls in support of other project consortiums from the same call as iMagine.