Call for tenders EGI/2023/OP/0001

Purchase of software services for image analysis in phenological research with implementation, licensing, support and maintenance

Open procedure

TENDER SPECIFICATIONS

based on "EOSC Future Project" co-funded by the European Union Horizon Programme call INFRAEOSC-03-2020

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1. SCOPE AND DESCRIPTION OF THE PROCUREMENT

1.1. Who is the buyer?

The EGI Foundation is the coordinating body of the EGI Federation. It was established as not-for-profit organization in 2010 with a headquarters in Amsterdam, Netherlands. The EGI Foundation offers a federation and management platform that enables service providers to harmonize interfaces and connect to a common hub. The foundation team engages with research communities to understand the demand, to simplify the access and to drive innovation together.
The EGI Foundation delivers a number of supporting services in areas such as overseeing infrastructure operations, user community support, engagement with technology providers, strategy and policy development, flagship events and dissemination of news and achievements. Some of these services are outsourced to specific EGI service providers.

1.2. Subject: what is this call for tenders about?

The subject of this call for tenders is to purchase a software service for image analysis in phenological research, including implementation, licensing, and maintenance on in-house storage and computing infrastructure.

1.3. Lots: is this call for tenders divided into lots?

This call for tenders is not divided into lots.

1.4. Description: what do we want to buy through this call for tenders?

The services that are the subject of this call for tenders, including any minimum requirements, are described in detail under section 1.4.2.

Variants (alternatives to the model solution described in the tender specifications) are not allowed. The *EGI FOUNDATION* will disregard any variants described in a tender.

1.4.1. <u>**Background and objectives**</u>

The EOSC Digital Innovation Hub (EOSC DIH) through the EOSC Future project is working towards fostering innovation within EOSC, buying products or services (co-)developed by commercial companies in collaboration with the EOSC DIH and the EOSC communities. EOSC DIH explored the needs and requirements of the research communities and clusters. Among the expression of interest received by research communities, the EOSC DIH selected the one provided by Poznán University of Life Sciences (PULS), Poland, described as follows:

Which problem are the users (research community) trying to solve?

Phenology is the science of how vegetation changes over time, and classical phenological research focuses on observations of seasonal events such as budding, flowering, fruiting, and ageing. This scientific discipline is of growing interest and attracts the attention not only of the wider public or scientists, but also of the agri-food and forestry sectors. The reason for this is that both the onset and duration of the various stages of plant

development are dictated by environmental conditions, but also by human activities. In this way, vegetation analysis also provides direct information on the conditions under which the vegetation cover functions in the landscape. Such observations are also of particular importance in the context of assessing the response of vegetation to progressive climate change, with increasingly frequent droughts affecting both the condition and occurrence of plants in the environment.

Phenological stages can be detected by different methods such as individual observations, near-surface measurements, and satellite remote sensing. In the case of near-surface observations digital phenological imaging with time-lapse cameras is used in scientific and engineering projects. The aim of that activities is to understand phenological characteristics of plants both in croplands and in non-productive ecosystems. More and more phenotyping cameras dedicated to specialized practical solutions and for basic research are appearing on the market. However, there are no available open tools to facilitate the collection of such data and their analysis using machine learning (ML) techniques. The proposed tool will allow to solve the problems of automation and efficient application of ML tools in time series analysis of images from phenological imaging of: 1) crop plants, their vegetative or generative parts, in order to predict their yield under climate change conditions; 2) ecosystems towards the analysis of key species development during the growing season in the context of carbon and water balance studies in order to describe quantitatively and qualitatively the impact of climate change on ecosystem functioning. The proposed tool aims to address the lack of IT tools for efficient storage, processing, and analysis of phenological images through the use of ML.

What do the users need and want?

In order to solve the presented problems, it is necessary to prepare 1) a procedure and protocol, 2) a platform with APIs and GUI with the functionality to:
- managing the acquisition and visualisation of images - APIs for selected to types of cameras with low (e.g. Dahua IP 5Mpx, Dahua Technology, China) and high resolution (e.g: CropView 10Mpx, Pessl Instruments, Austria) and transmission with a dedicated frequency (e.g. 1 pic/ 30 min.);
- Functional use of PhenoPicx (R; https://cran.r-project.org/package=phenopix) or Pheno Win (https://github.com/Sarabac/PhenoWin) or comparable software for post-processing, with particular focus on: ROI tracking, Control and correction of camera position and ROI over time, Calculation of phenological sub-coefficients type 1 (R, G, B, brightness, variance) as well as type 2 (phenological phases (GOP, ROP) and image analysis;
- Time series analysis of images using ML tools for two use cases: 1. Fruit growth analysis of a selected fruit crop based on analysis of images from the growing season; 2. Growth analysis of generative organs of a selected indicator crop based on analysis of images from the growing season;
- Functionality for uploading custom ML models, i.e. user libraries for the analysis of other species and use cases, together with examples of a library preparation protocol (outside of this tool).

What will the users achieve when the service / tool is provided?

Users will receive an IT tool for image acquisition management, image storage and image analysis using ML methods. Currently, scientists have to use separate IT tools for each of these stages, and the proposed solution will be characterised by flexibility allowing to extend the utilitarian potential of this tool in the directions of further environmental research, e.g.

landscape analysis, or agricultural research, e.g. crop yield forecasting, or IT research, e.g. AI.

General objective

The work carried out through this call for tenders is expected to be co-developed in collaboration with the EOSC DIH and the Research Community to make it accessible via the EOSC Marketplace. EOSC DIH will boy these solutions from the private sector to cover the needs of the research communities while bringing value and new offerings to the EOSC.

Specific objectives

1. Obtain a phenological digital platform for the transmission, storage, and export of images from selected types of time-lapses cameras dedicated to digital phenological imagery;
2. Obtain digital tools for manual and automatic image analysis from digital phenological imagery with visualization of results;
3. Obtain digital tools to apply externally produced AI models to identify and analyse objects in phenological imagery;
4. Obtain two ready-to-use AI models of automatic ROI detection for two cases: i.e Apple (Malus domestica Borkh, marketable varieties) fruit detection, flowering stage of European linden (Tilia cordata Mill).
5. Obtain tools to manage the phenological digital platform in terms of data and users.

1.4.2. Detailed characteristics of the purchase

EGI Foundation wishes to contract services corresponding to the following characteristics: Please fill in **Annex 8.1**. with your proposal.

Technical requirements:

1. Functional requirements:

ID	Type	Description
General Functional requirements		
GFR_1	System	The system is to be based on an open source engine
GFR_2	System	The system is to be web-based software with local or/and cloud data storage
GFR_3	System	The system is to have the ability to run operationally in the Market Place EOSC for a minimum of one year from delivery
GFR_4	System	Full functionality for common Windows and Mac browsers as well as Android, iOS mobile device browsers.
GFR_5	Users	Functions to create three types of users: 1) Administrator; 2) User of cameras and analysis tools – power user; 3) Analytical tools user – user;
GFR_6	Users	The function of creating statistics on the type of user and

		use cases of the service. At the account creation stage and at the time of use: university/unit, level of expertise (degree, student etc), research field, purpose of use
GFR_7	Admin	Possibility of account management and admin communication with users of different types.
Specific Functional requirements		
	Data acquisition and storage (DAS)	
SFR_DAS_1	Camera data	Communication with IP camera type 1 (minimum 5 MPx) and camera type 2 (minimum 10 MPx) with configurable image stream schedule
SFR_DAS_2	Camera data	Communication with IP camera type 1 (minimum 5 MPx) and camera type 2 (minimum 10 MPx) own server with configurable image stream schedule
SFR_DAS_3	Camera data	Transfer of data from camera type 1 and 2 allowing - transfer from SD card
SFR_DAS_4	Input data	Uses common image standards (e.g. jpg, tiff etc.)
SFR_DAS_5	Camera data	Configuration of acquisition and storage of a series of images from a type 1 (resolution minimum 5MPx) and type 2 (resolution minimum 10MPx) camera with IoT transfer, every scheduled time (e.g. every 10 minutes), resolution or defined number of images per day (eg.20 images per day, but at proper sun elevation), Local data backup on SD card in case of communication problems bias with central DB
SFR_DAS_6	Camera data	Generation of alerts for malfunctions of Type 1 and Type 2 cameras (e.g. power supply), and transmission and storage abnormalities (damaged and/or missing image indication).
SFR_DAS_7	Camera auxiliary data	Auxiliary data (e.g. camera type, site location, setup parameters, maintenance etc.) storage space
SFR_DP_8	Camera auxiliary data	Manage, access, shape, clean, filter, upload historical and actual data in the form of images, time series. e.g. json, xlsx.
SFR_DAS_9	Third-party data sources	Automatic retrieval and store of meteorological data (the nearest stations) from open/public meteo databases e.g. https://www.edwin.gov.pl/meteo-api
SFR_DAS_10	Image data	Manual images tagging tool.(e.g. forest, farmland, grassland, peatland, other)
SFR_DAS	Image	Tool for searching the image database by type 3 users

_11	data	(without cameras) on the basis of camera and image metadata + tags. Image browser for selection of reference image during ROI definition
SFR_DAS _12	Image data	Image selection to remove images that are too bright or too dark, achieved by selecting images according to the position of the sun at the camera location based on open/public scripts
Data analysis (DA)		
SFR_DA_ 1	ROI definitio n	Tool for manual ROI (mROI) definition: polygon creator with possibility of modifying vertices before accepting final version of polygon (after that no modification is possible)
SFR_DA_ 2	ROI definitio n	Tool for manual ROI definition: possibility of creating more than one ROI (multi manual ROI, mmROI) in the reference image
SFR_DA_ 3	ROI definitio n	Automatic definition of ROIs (automatic ROIs, aROIs) in images using machine learning methods based on an external user model.
SFR_DA_ 4	ROI definitio n	Tool for uploading any already pretrained model (Automatic definition of ROIs) into the system/service according to the assumptions in the documentation and then use of e.g. classify method for input data with examples of model preparation protocol.
SFR_DA_ 5	ROI data	Analytics for automatic ROIs: RGB indexes, height, width, area,
SFR_DA_ 6	ROI data	Pairwise correlation, across all pixels in the ROI, between red DN and green DN, red DN and blue DN, and green DN and blue DN,
SFR_DA_ 7	ROI data - averaged	Averaged RGB in ROI approach: Computation of red, green, blue digital numbers (DN, from 0 to 255) over the ROI
SFR_DA_ 8	ROI data- averaged fitting	Fitting vegetation curve to filtered ROI data
SFR_DA_ 9	Image & ROI meta data	Time and Date Extraction (TDE) – time and data retrieving from files properties and/or images (date stamp)
SFR_DA_ 10	Image and ROI data - custom	Customised colour indexes (CIs) - Script upload tool for custom CIs, created externally by the user.
Built-in examples of trained AI models (AIM)		

SFR_AIM_1	Apple AI model	Ready-to-use in service AI model for automatic ROIs detection – use case: Apple (*Malus domestica* Borkh., marketable varieties) fruit detection. Model quality of detection mIoU>0.75 (least mean Intersection over Union). Model quality will allow on achieving 75% the area of overlap between the predicted detection and the ground truth divided by the area of union between the predicted detection and the ground truth. Training images provided to the contractor by the ordering party/experts of the contracting party.
SFR_AIM_2	Flowering AI model	Ready-to-use in service AI model for automatic ROIs analysis – use case: detection of flowering stage of European linden (*Tilia cordata* Mill.). Model quality of detection mIoU>0.70 (least mean Intersection over Union). Model quality will allow on achieving 70% the area of overlap between the predicted detection and the ground truth divided by the area of union between the predicted detection and the ground truth. Training images provided to the contractor by the ordering party/experts of the contracting party.
	Data visualization (DV)	
SFR_DV_1	Image & ROI	Data and selected images presentation (print ROI on selected image, export results (e.g. xls, csv))
SFR_DV_2	Image & ROI	Visualisation of images and ROI
SFR_DV_3	Image & ROI	Visualisation of the number and properties of identified objects over time (e.g. graphs, statistics)
SFR_DV_4	ROI data	Visualisation of ROI analysis results over time (e.g. graphs)
SFR_DV_5	ROI data	Visualisation of vegetation curve (e.g. ROI-averaged approach)
SFR_DV_6	ROI data	Classification graphs
SFR_DV_7	ROI data	Visualisation of images where defined objects are identified (AI results)
SFR_DV_8	ROI data	Visualisation of fruit/organ identification results
SFR_DV_9	Camera data	Visualisation of camera data and image metadata
SFR_DV_10	Camera data	Visualisation of camera locations on maps
SFR_DV_11	User data	Visualisation of premium user and user account data
SFR_DV_	Admin	Visualisation of premium and user use cases, alerts,

12	data	system messages.
	Data export	
SFR_DE_1	Image data	Export of images to local media, possibility of exporting to cloud services (e.g. Dropbox)
SFR_DE_2	Analysis data	Export of analysis results to local media, possibility of export to cloud services (e.g. Dropbox)
SFR_DE_3	ROI data	export ROI data (polygon coordinates) to file

2. Performance requirements:

Performance requirements:	
PR_1	24/7 service availability on EOSC Marketplace

3. Platform and infrastructure requirements: Specify any platform or infrastructure requirements, such as operating systems, databases, or development tools.

Besides the functional requirements already mentioned:
- The solution must be available on Open Source;
- The system will be ready for being integrated in the EOSC Marketplace;
- Ability to run on PULS, infrastructure, without contractor involvement - code supplied to PULS;
- Ready-to-use in service AI models deposited in the repository & supplied to PULS;
- Ready-to-use in service AI models operational in the EOSC Marketplace.

4. Support and maintenance requirements

User tutorials in English (and preferably also in Polish) for: 1) camera connection, 2) data processing and analysis, since the service will cover the needs of the agriculture research community.

In order to guarantee the quality of the software developed and its perfect functioning, the winning company will be responsible for any maintenance tasks that may be necessary until 30th September 2023.

Contractual Deliverables

First milestone report: the successful bidder must deliver this monitoring report just in month 2,5, clearly indicating how the development of the project is progressing, what activities have been carried out, the milestone achieved, problems detected in the development of the software, error tests carried out and solutions given. The first milestone is the achievement of manufactured prototype service for transfer and storage of camera/sensor data. To be completed the successful bidder has to prove the following: correctly transferred and collected images over a 14-day period for 2 types of cameras.

Second milestone report: the successful bidder must deliver the prototype of service with tested functionalities ready to deployment. Additionally, it considers:
- User test report (eg. UAT)

- Phenological and AI/ML algorithms deposited in the repository

This deliverable must be done at maximum of 5 months from the date of the signature of the contract and sent with the final report.

Final Report: before the end of the 5ᵗʰ month, the successful bidder will produce a final report summarizing the activities carried out under this contract. It should briefly describe the development of the project and its activities carried out. This final report will have a maximum length of 20 pages and will be delivered in electronic format via email in English with the Second Milestone Report.

1.4.3. <u>Deliverables linked to payments</u>

The submission and acceptance of the **first milestone report**, preceded by the submission and acceptance of the deliverable foreseen up to month 2,5, will entail an interim payment of 40% of the total payment.

The submission and acceptance of the **second milestone report** and the **final report**, preceded by the submission, evaluation, and acceptance of all deliverables foreseen up to month 5, will entail an interim payment of 60% of the total payment.

Project activities

Month		Activities
M1	A0	Kick-off meeting
M1-2,5	A1	**Development of tools for data transfer and storage**
M1-2,5	A1.1	Camera data transfer type 1
M1-2,5	A1.2	Camera data transfer type 2
M1-2,5	A1.3	Image database
M1-2,5	A1.4	Backend for transfer and storage management v.1
M1-2,5	A1.5	Manual (v1 version) for integration of type 1 and type 2 cameras into the system
M2,5-5	A2	**Development of the tools for data processing and visualization in GUI**
M2,5-5	A2.1	Deployment of the final solution to production environment
M1-5	A3	**Development of models for phenological and AI analysis**
M1-5	A3.1	Collection of data for modelling
M1-5	A3.2	Development of models in laboratory version
M1-5	A3.3	Development of models in prototype version
M1-5	A3.4	Deployment of the final solution in the EOSC Marketplace

The start of the service will be formalised by a kick-off meeting including the successful bidder, the Research Community (PULS) and members of the EOSC DIH which will take place remotely within 1 week following the signature of the Contract. The purpose of the kick-off meeting is to discuss and fine-tune all aspects concerning the execution of the contract.

Performance Indicators

Contractors shall collect data on the following specific action-level indicators in their regular reporting activities:

N°	Indicator	Target
1	Correct transmission and recording of images from type 1 and type 2 cameras, working in two ecosystems for a minimum of 1 month with a minimum frequency of 7 images per day	Less than 2% error
2	Pheno and AI result indicators from type 1 and type 2 cameras working in two ecosystems for a minimum of 1 months.	No less than 3 pheno results No less than 2 AI results

The tenderers are required to include in their tender additional specific action-level indicators, which will be agreed with the *EGI FOUNDATION* at the inception phase.

When deemed necessary to complement the above indicators, the *EGI FOUNDATION* will require, and agree with the contractor, to collect data for a maximum of 2 additional specific action-level indicators.

An overview of the data on performance indicators should be included in the final report.

Phasing out and handover requirements

This service contract concerns deliverables such as the software tool developed and its tasks that need to be transferred with their full set of functionalities at the end of the contract duration.

The tenderer should propose a methodology for the smooth transfer of the software tool and all necessary supporting IT system and other tools to the EGI FOUNDATION or any entity/organization designated by the latter.

Confidentiality

For the purpose of this contract any facts, information, knowledge, documents or other matters which may have been communicated to or obtained by the contractor in the context of the Contract shall be deemed confidential per se even after the completion of the tasks.

Data protection

The offer must describe the types of personal data that the contractor will be processing during the provision of this service. Particularly, data which might be contained in the source information for the performance of systematic reviews and data collected during the implementation of this contract.

Where relevant, tenderers are requested to detail measures for ensuring that the service delivery will be compliant with the data protection rules. For any use of special categories of data, the tenderer must describe how specific technical security measures will be adopted.

Data must be processed only within the EU/servers must be kept in the EU.

Intellectual property rights

Compliance with copyright law and other intellectual property legislation is of utmost importance for the *EGI FOUNDATION*. When providing the services, the contractor has to ensure compliance with the applicable copyright and other intellectual property legislation.
The bidder shall develop the software solution specified in the tender documents as an open-source software solution under the Apache License 2.0.

The results of the developments carried out by the winning company during the duration of this 5-month contract will remain the property of the company, which will be free to exploit them commercially and economically in the geographical area it considers. For all non-commercial uses, the company undertakes by the acceptance of this contract to transfer them in OPEN SOURCE to EGI through the EOSC platform with the aim of supporting the European scientific community exclusively in their research for non-commercial purposes. EGI reserves the possibility to transfer the exploitation of these rights to the scientific communities it supports, especially to PULS. Further developments or improvements by the winning company of the software developed in the framework of this contract will be the exclusive property of the winning company.

1.5. Place of performance: where will the contract be performed?

The services will be performed at the contractor's premises or, for the purposes of the activities required at any other location specified in the offer by the Tenderer.
The premises of EGI FOUNDATION are:
- This contract must be done within the European Union.
- The tenderer must be established in the European Union.
- The tenderer must maintain a collaborative work with the Polish scientific community "PULS".

1.6. Nature of the contract: how will the contract be implemented?

The procedure will result in the conclusion of a direct contract.

In direct contracts all the terms governing the provision of the services, supplies or works are defined at the outset. Once signed, they can be implemented directly without any further

contract procedures.

Tenderers need to take full account of the provisions of the draft contract as the latter will define and govern the contractual relationship to be established between the *EGI FOUNDATION* and the successful tenderer.

1.7. Volume and value of the contract: how much do we plan to buy?

The estimated total amount of all purchases under this contract is indicated under Heading II.1.5 of the contract notice. The quantities/services to be purchased over the total duration of the contract are specified under section 1.4 of these specifications.

1.8. Duration of the contract: how long do we plan to use the contract?

The contract(s) resulting from the award of this call for tenders will be concluded for a maximum period of 5 months from the signature of the contract, finishing at the latest the 15th of September 2023.

2. GENERAL INFORMATION ON TENDERING

2.1. Legal basis: what are the rules?

This call for tenders is governed by the provisions of Regulation (EU) nº 1291/2013 of the European Parliament and of the Council of 11 December 2013 establishing Horizon 2020 – the Framework Programme for Research and Innovation (2014-2020) and DIRECTIVE 2014/24/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 26 February 2014 on public procurement.

The *EGI FOUNDATION* has chosen to award the contract resulting from this call for tenders through an open procedure. In this call for tenders any legal person incorporated in the EU, fitting with the exclusion and eligibility criteria, who offers to supply products, provide services, or execute works may submit a tender.

The legal framework for the tendering procedure and the performance of the Contract is constituted by the provisions of the invitation to tender, the tender specifications and the template of the contract, the terms of which are not negotiable. The submitted tender is binding on the successful tenderer. It is incorporated into the Template Service Contract. Bids from companies will be drawn up in strict compliance with these tender specifications.

2.2. Rules on access to procurement: who may submit a tender?

Participation in this call for tenders is open on equal terms to all legal persons within the scope of software development focused on the agriculture and horticulture sciences, forestry sciences, earth, and related sciences, as well as on the following conditions laid down:
- This call is open to all legal persons established in the European Union
- This call is open to all legal persons that have carried out projects related to the scientific community, or the fields above mentioned.

Subcontracting is forbidden in this tender.

Interested candidates must send all the documents listed in **Annex 0** to the email address indicated. Failure to provide one of the listed documents may lead to the elimination from the procedure. To check how to sign validly the documents of your offer, see point 4.3. of these specifications.

2.3. Ways to submit a tender: how can economic operators organise themselves to submit a tender?

Economic operators (all legal persons) can submit a tender as a sole economic operator (sole tenderer), or as a group of economic operators (joint tender). In either case subcontracting is not permitted.

In order to fulfil the selection criteria, set out in *Section 3.2* the tenderer can rely on the capacities or other entities that are not subcontractors.

The role of each entity involved in a tender (hereafter referred to as "*involved entity*") must be clearly specified in the application: i) sole tenderer, ii) *Group leader* of a group oftenderers, iii) member of a group of tenderers. For an entity on whose capacities the tenderer relies to fulfil the selection criteria (that is not a subcontractor), this role is defined in the commitment letter (**Annex 7**).

Joint tenders

A joint tender is a situation where a tender is submitted by a group (with or without legal form) of economic operators regardless of the link they have between them. The group as a whole is considered a tenderer.

All members of the group assume joint and several liability towards the EGI FOUNDATION for the performance of the contract as a whole.

Group members must appoint a Group leader and a single point of contact authorised to act on their behalf in connection with the submission of the tender and all relevant questions, clarification requests, notifications, etc., that may be received during the evaluation, award and until the contract signature. The model power of attorney attached in **Annex 3** is to be used.

The joint tender must clearly indicate the role and tasks of each member and of the Group leader who will act as the EGI FOUNDATION's contact point for the contract's administrative or financial aspects and operational management. The Group leader will have full authority to bind the group and each of its members during contract execution. If the joint tender is successful, the EGI FOUNDATION shall sign the contract with the Group leader, authorised by the other members to sign the contract on their behalf via power of attorney drawn up in the model attached in **Annex 3** .

Changes in the composition of the group during the procurement procedure (after the submission deadline and before contract signature) shall lead to rejection of the tender except in case of a merger or takeover of a member of the group (universal succession), provided that the new entity has access to procurement (see Section 2.2) and is not in an exclusion situation, (see Section 3.1).

In any case the selection criteria must be still fulfilled by the group and the terms of the originally submitted tender may not be altered substantially, i.e. all the tasks assigned to the former entity must be taken over by the new entity member of the group, the change must not make the tender non-compliant with the tender specifications, and the evaluation of award criteria of the originally submitted tender may not be modified.
 References to *tenderer* or *tenderers* in this document shall be understood as covering both sole tenderers and groups of economic operators submitting a joint tender.

Tenders must be submitted exclusively via the electronic submission system provided by EGI FOUNDATION available from the EGI's website and publicly accessible. Tenders submitted in any other way will be disregarded.
In order to submit a tender according to the EGI FOUNDATION system, the economic operators will need to send their proposals via email to the next direction available for this purpose: business@egi.eu
An e-mail address is also available for queries about the submission procedure: business@egi.eu
The deadline for receiving questions regarding the tender is 5 days before the submission of bids.

The time-limit for receipt of tenders is March 15, 2023; 23:59 CET where local time shall be understood as local time at the EGI FOUNDATION's location (the location indicated under Section IV.2.2 of the contract notice).

All candidates will receive an email confirming receipt of the offers sent within 24 hours.
Tenderers must ensure that their submitted tenders contain all the information and documents required by the EGI FOUNDATION at the time of submission as set out in the procurement documents.

Subcontracting

Subcontracting is the situation where the contractor enters into legal commitments with other economic operators which will perform part of the contract on its behalf. The contractor retains full liability towards the *EGI FOUNDATION* for the performance of the contract as a whole. **Therefore, subcontracting must not be in place in the frame of this tender.**

The following shall not be considered subcontracting:

a)   Use of workers posted to the contractor by another company owned by the same group and established in a Member State ("intra-group posting" as defined by Article 1, 3, (b) of Directive 96/71/EC concerning the posting of workers in the framework of the provision of services).
b)   Use of workers hired out to the contractor by a temporary employment undertaking or placement agency established in a Member State ("hiring out of workers" as defined by Article 1, 3, (c) of Directive 96/71/EC concerning the posting of workers in the framework of the provision of services).

c)   Use of workers temporarily transferred to the contractor from an undertaking established outside the territory of a Member State and that belongs to the same group ("intra-corporate transfer" as defined by Article 3, (b) of Directive 2014/66/EU on the conditions of entry and residence of third-country nationals in the framework of an intra-corporate transfer).

d)   Use of staff without employment contract ("self-employed persons working for the contractor"), without the tasks of the self-employed persons being particular well- defined parts of the contract.

e)   Use of suppliers and/or transporters by the contractor, in order to perform the contract at the place of performance, unless the economic activities of the suppliers and/or the transporting services are within the subject of this call for tenders (see *Section 1.4*).

f)   Performance of part of the contract by members of an EEIG (European Economic Interest Grouping), when the EEIG is itself a contractor or a group member.

The persons mentioned in points a), b), c) and d) above will be considered as "personnel" of the contractor as defined in the contract.

Entities on whose capacities the tenderer relies to fulfil the selection criteria

In order to fulfil the selection criteria a tenderer may also rely on the capacities of other entities, regardless of the legal nature of the links it has with them. It must in that case prove that it will have at its disposal the resources necessary for the performance of the contract by producing a commitment letter in the model attached in **Annex 7**, signed by the authorised representative of such an entity, and the supporting evidence that those other entities have the respective resources. If the contract is awarded to a tenderer intending to rely on another entity to meet the minimum levels of economic and financial capacity, the *EGI FOUNDATION* may require the entity to sign the contract or, alternatively, to provide a joint and several first-call financial guarantee for the performance of the contract.

With regard to technical and professional selection criteria, a tenderer may only rely on the capacities of other entities where the latter will perform the works or services for which these capacities are required.

3. EVALUATION AND AWARD

The evaluation of the tenders that comply with the submission conditions will consist of the following elements:

- Check if the tenderer has access to procurement (see *Section 2.2*);
- Verification of administrative compliance (if the tender is drawn up in one of the official EU languages and the required documents signed by duly authorised representative(-s) of the tenderer);
- Verification of non-exclusion of tenderers on the basis of the exclusion criteria;
- Selection of tenderers on the basis of selection criteria;
- Verification of compliance with the minimum requirements specified in the procurement documents;
- Evaluation of tenders on the basis of the award criteria.

The *EGI FOUNDATION* will evaluate the above-mentioned elements in the order that it considers to be the most appropriate. If the evaluation of one or more elements demonstrates that there are grounds for rejection, the tender will be rejected and will not be subjected to further full evaluation. The unsuccessful tenderers will be informed of the ground for rejection

without being given feedback on the non-assessed content of their tenders. Only tenderer(s) for whom the verification of all elements did not reveal grounds for rejection can be awarded the contract.

The evaluation will be based on the information and evidence contained in the tenders and, if applicable, on additional information and evidence provided at the request of the *EGI FOUNDATION* during the procedure. If any of the declarations or information provided proves to be false, the *EGI FOUNDATION* may impose administrative sanctions (exclusion or financial penalties) on the entity providing the false declarations/information.

For the purposes of the evaluation related to exclusion and selection criteria the *EGI FOUNDATION* may also refer to publicly available information, in particular evidence that it can access on its website or other public database.

The EGI FOUNDATION may reject abnormally low tenders, in particular if it established that the tenderer does not comply with applicable obligations in the fields of environmental, social, labour law, and other considered as fundamental.

3.1. Exclusion criteria

The objective of the exclusion criteria is to assess whether the tenderer is in any of the exclusion situations listed in Article 57 of DIRECTIVE 2014/24/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 26 February 2014 on public procurement.

Tenderers found to be in an exclusion situation will be rejected.

As evidence of non-exclusion each tenderer needs to submit with its tender a Declaration on Honour in the model available in **Annex 4.** The declaration must be signed by an authorised representative of the entity providing the declaration.

The documents mentioned as supporting evidence in the Declaration on Honour need to be provided whenever requested and where this is necessary to ensure the proper conduct of the procedure within a deadline given by the *EGI FOUNDATION*.

Before the award decision, the EGI FOUNDATION may request documentary evidence on compliance on the exclusion criteria set out in the present tender specifications. All tenderers are invited to prepare in advance the documents related to the evidence, since they may be requested to provide such evidence within a short deadline. Failure to provide valid documentary evidence within the deadline set by the EGI FOUNDATION shall lead to the rejection of the tender for the award of the contract, unless the tenderer can justify the failure on the grounds of material impossibility. **Please note that a request for evidence in no way implies that the tenderer has beensuccessful.**

3.2 Selection criteria

The objective of the selection criteria is to assess whether the tenderer has the legal, regulatory, economic, financial, technical, and professional capacity to perform the contract.

The selection criteria for this call for tenders, including the minimum levels of capacity, the basis for assessment and the evidence required, are specified in the following subsections.

Tenders submitted by tenderers not meeting the minimum levels of capacity will be rejected.

When submitting its tender each tenderer shall declare on honour that it fulfils the selection criteria for the call for tenders. The model Declaration on Honour available in **Annex 4** shall be used.

The initial assessment of whether a tenderer fulfils the selection criteria will be done on the basis of the submitted declaration.

The subsections below specify which selection criteria evidence must be provided with the tender or may be requested later, at any time during the procurement procedure. In any case, to the extent that there is no ground for a waiver, the evidence must be provided, upon request and within a deadline given by the *EGI FOUNDATION*. The evidence must be provided in accordance with the applicable basis for assessment of each criterion.

Before the award decision, the EGI FOUNDATION may request documentary evidence on compliance with the selection criteria set out in the present tender specifications. All tenderers are **invited to prepare in advance the documents related to the evidence**, since they may be requested to provide such evidence in a short deadline.

Failure to provide valid documentary evidence within the deadline set by the EGI FOUNDATION shall lead to the rejection of the tender for the award of the contract, unless the tenderer can justify the failure on the grounds of material impossibility.

Legal and regulatory capacity

Tenderers do not need to prove specific legal and regulatory capacity to perform the contract. However, tenderers must prove that they are a legal person or entity.

Economic and financial capacity

Tenderers must comply with the following selection criteria in order to prove that they have the necessary economic and financial capacity to perform the contract.

Criterion F1	
Minimum level of capacity	The average yearly turnover of the last three financial years must be at least EUR 180.000 (one hundred eighty thousand euros).
Basis for assessment	This criterion applies to the tenderer as a whole, i.e. a consolidated assessment of the combined capacities of all *involved entities* will be carried out.
Evidence	Copy of the profit and loss accounts and balance sheets for the last three years for which accounts have been closed from each concerned involved entity.

Technical and professional capacity

Tenderers must comply with the following selection criteria in order to prove that they have the necessary technical and professional capacity to perform the contract.

Criterion T1	
The tenderer must prove scientific expertise in the field of **software development focused on the agriculture and horticulture sciences, forestry sciences, earth, and related sciences.**	
Minimum level of capacity	At least two similar (in scope and complexity) projects completed in the last five years preceding the tender submission deadline, with a minimum value for each of them of 30.000 €
Basis for assessment	This criterion applies to the tenderer as a whole, i.e. a consolidated assessment of the combined capacities of all *involved entities* will be carried out.
Evidence	A list of projects meeting the minimum level of capacity. The list shall include details of their start and end date, total project and scope, role and amount invoiced. In case of projects still ongoing, only the portion completed during the reference period will be taken into consideration. Please complete **Annex 6**. As supporting documents for each project reference the EGI FOUNDATION may request statements issued by the clients and take contact with them.

Criterion T2	
The tenderer must prove experience in **providing digital solutions**, developing digital platforms for access and sharing of information for research and innovation purposes withing the European Union, and the provision of maintenance services.	
Minimum level of capacity	At least two similar (in scope and complexity) projects, completed in the last five years preceding the tender submission deadline, with a minimum value for each of them of 30.000 €.
Basis for assessment	This criterion applies to the tenderer as a whole, i.e. a consolidated assessment of the combined capacities of all *involved entities* will be carried out.
Evidence	A list of projects meeting the minimum level of capacity. The list shall include details of their start and end date, total project amount and scope, role and amount invoiced. In case of projects still ongoing only the portion completed during the reference period will be taken into consideration. Please complete **Annex 6**. As supporting documents for each project reference the EGI FOUNDATION may request statements issued by the clients and take contact with them.

The **team delivering** the service shall include, as a minimum, the following profiles.

Criterion T3	
The tenderer must demonstrate the ability to provide a core team experienced in software development and all the tasks and fields its gather. Furthermore, the tenderer must guarantee that the team selected is willing to maintain collaborative work with EOSC DIH and the PULS scientific and research team.	
Profile and minimum levelof capacity	- **Two seniors developers (back-end and front-end):** with more than 5 years of experience in the development and implementation of digital solutions for the agro-food or life sciences sector. - **One Artificial Intelligence Expert:** with more than 3 years of experience working with IA applications in image processing. - **One senior "Internet of Things (IoT)" developer:** one senior developer with more than 3 years of experience working with processing data from IoT for expert systems.
Basis for assessment	This criterion applies to the tenderer as a whole, i.e. the combined capacities of all involved entities.
Evidence	Tenderers will present the list of members of the core team together with their CVs. The CV of the proposed for experts must be in **Europass format** and shall clearly specify how the criteria are met.

All proposed group members must be available from the start of the Contract period and as far as possible until the end of the project.

Replacement of persons assigned to carry out the work

The EGI FOUNDATION expects the Contract to be executed by the specific team members who were identified and named in the offer. The involvement of key experts is considered to be instrumental in the achievement of the Contract objectives.

Any replacement of experts due to unforeseen circumstances outside of the control of the contractor must be notified to the EGI FOUNDATION who can request to modify the proposal if the expert proposed for replacement does not have at least equivalent qualifications (studies and professional experience) to those proposed in the technical offer. Replacement of experts could cause cancellation of the Contract if not considered acceptable by the EGI FOUNDATION in advance. Whenever a replacement occurs, the contractor must ensure a high degree of stability of the services and a smooth transfer of information. Any replacement must be submitted to the EGI FOUNDATION for written approval at least one week before the intended date of replacement which shall not be more than two weeks after the former expert has left the team.

Not respecting these requirements may lead to the application of penalties as foreseen in the Contract.

Unless otherwise provided, in the case where the EGI FOUNDATION in writing requests a replacement, the contractor's proposal for the replacement must be given within one week from receipt of the EGI FOUNDATION's request. It shall be considered as a breach of Contract if such a proposal is not made within the above specified period.

The replacement shall not oblige the EGI FOUNDATION to pay any additional remuneration, fees or costs other than those laid down in the initial Contract. The contractor shall bear all the additional costs arising out of or incidental to such replacement. Such costs borne by the contractor shall include the costs of the return journey of the replaced member of staff and his family, the costs of the replacement's training and hand-over of information and, if necessary, the expenses arising from the need to maintain simultaneously at the place of work the member of staff to be replaced and his replacement. Replacement shall not lead to any extension of deadlines.

3.3 Compliance with the minimum requirements specified in the procurement documents

By submitting a tender, a tenderer commits to perform the contract in full compliance with the terms and conditions of the procurement documents for this call for tenders. Particular attention is drawn to the minimum requirements specified in Section 1.4 of these specifications and to the fact that tenders must comply with applicable data protection, environmental, social and labour law obligations established by Union law, national legislation, collective agreements or the international environmental, social and labour conventions listed in Annex X to Directive 2014/24/EU.

The minimum requirements shall be observed throughout the entire duration of the contract.

☞ **Tenders that are not compliant with the applicable minimum requirements shall be rejected.**

Compliance with these requirements is mandatory and cannot be subject to any assumptions, limitations, conditions, or reservations on the part of a tenderer.

3.4 Award criteria

The objective of the award criteria is to evaluate the tenders with a view to choosing the most economically advantageous tender.

Tenders will be evaluated on the basis of the following award criteria and their weighting:

1) Price - 30%

The price considered for evaluation will be the total price of the tender, covering all the requirements set out in the tender specifications.

2) Quality - 70%

The quality of the tender will be evaluated based on the following criteria:

Quality award criteria	Explanation of the criterion's scope	Maximum number of points per criterion (weighting)	Minimum points to be obtained (60% per criterion)
Award criterion 1 (with 3 sub-criteria): **Methodology**	This criterion will assess the appropriateness and quality of the proposed methodologies and tools to carry out the tasks as laid down in the tender specifications. The tender should include a methodology and tool the identification of adequate sources of information, the presentation of data collection and analysis methods, and the approaches to consultation activities.	42 (sum of evaluation of all sub-criteria)	60%
	Sub-criterion 1.1: Quality and relevance of the proposed methodology for the implementation of activity 1:	14	60%
	Sub-criterion 1.2: Quality and relevance of the proposed methodology for the implementation of activity 2:	14	60%
	Sub-criterion 1.3: Quality and relevance of the proposed methodology for the implementation of activity 3	14	60%

Award criterion 2 (with no sub-criteria): **Organisation of the work and resources**	This criterion will assess how the roles and responsibilities of the proposed team are distributed for each activity and/or deliverable. The global allocation of time and human resources to the project is also assessed, and whether this allocation is adequate for the work. The tenderer should describe the composition and structure of the team, the proposed schedule (using Gantt chart or a similar illustrative method) for the implementation of the different tasks and activities with the start/end time of involvement and workload of each proposed team member	**14**	**60%**
Award criterion 3 (with no sub-criteria): **Quality control measures**	This criterion will assess the quality control system applied to the service foreseen in this tender specification concerning the quality of the software and the component connected to it. Thus, the risks management and continuity of the service in case of absence of the member of the team dedicated to a particular task. The quality system should be detailed and specific to the tasks at hand; a generic quality system will result in a low score. Measures to ensure compliance with the data protection Regulation will also be assessed under this criterion. Generic explanations will result in low score. Measures to ensure the performance of the software for at least 12 months after the end of the contract will result in a high score. i.e a support and maintenance system.	**14**	**60%**

Total points			70	60%

3.5 Award (ranking of tenders)

Tenders shall be ranked according to the best price-quality ratio in accordance with the formulabelow:

Score for tender X	=	Cheapest price / Price of tender X	*	100	*	Price weighting (in 30 %)	+	Total quality score (out of 100) for all award criteria of tender X	*	Quality weighting (in 70 %)

Should the outcome of the formula lead to two or more tenders with the same result, the tenderswith lower price will be ranked higher than the tenders with higher price.

☝ The contract shall be awarded to the tender ranked first, which complies with the minimum requirements specified in the procurement documents and is submitted by a tenderer having access to procurement, not in an exclusion situation and fulfilling the selection criteria.

4. FORM AND CONTENT OF THE TENDER

4.1 Form of the tender: how to submit the tender?

Tenders are to be submitted via email to business@egi.eu to be received on 15th March next at 23:59 CET time.

4.2 Content of the tender: what documents to submit with the tender?

The documents to be submitted with the tender are listed in **Annex 0.**

The following requirements apply to the technical and financial offer to be sent to email business@egi.eu

- *Technical offer.*

The technical offer must provide all the information needed to assess the compliance with Section 1.4.2 of these specifications and the award criteria. Tenders deviating from the minimum requirements or not covering all the requirements may be rejected on the basis of non-compliance and not evaluated further.

The technical offer (**Annex 8.1** and **Annex 8.2**) submitted by the tenderer shall be limited to a maximum of **20 pages**, excluding evidence provided for the assessment of exclusion and selection criteria, such as CVs, past projects or profit and loss accounts, etc. The evaluation of the technical offer against the award criteria will be based on the number of pages within this limit, **any additional pages will be disregarded**.

The recommended font is *Times New Roman* and minimum font size allowed is *11*. The page size is A4, and all margins (top, bottom, and left, right) should be at least 15 mm (not includingany footers or headers).

- *Financial offer.*

A complete financial offer, including the breakdown of the price needs to be uploaded. For thispurpose, the Financial Tender Form in **Annex 9** shall be completed and sent to email business@egi.eu.

The financial offer must fulfil the following requirements:

- prices shall be all-inclusive - all costs associated with the completion of the work,including overheads such as infrastructure, administration costs and travel costs and other costs, even not mentioned, but necessary for the completion shall be included in the overall fixed price in the financial offer (no reimbursable variable costs).
- prices shall be calculated to cover all the expenditure borne by the contractor in the performance of the Contract, including travel and subsistence expenses;
- prices shall be expressed in euro.
- prices should be expressed to a maximum of [2] decimal places;
- prices shall be quoted free of all duties, taxes and other charges, **i.e. also free of VAT**.

Invoices submitted by the company winning the tender will have to comply with the rules on VAT on the supply of services, in accordance with Directive 2006/112/EC in its consolidated version.

4.3 Signature policy: how can documents be signed?

The declaration is to be signed with:

1. Electronic signature (recommended option):

In case you have the possibility to sign the declaration using a qualified electronic signature (QES), please have it signed electronically by your authorised representative(s). Please note that only the qualified electronic signature (QES) within the meaning of Regulation (EU) No 910/2014 (eIDAS Regulation) will be accepted.

2. Handwritten signature:

In case you do not have the possibility to sign the declaration using a qualified electronic signature (QES), please fill it in electronically, then print it and have it signed and dated by your authorised representative(s) using a hand-written signature.

All documents must be signed by their duly authorised representatives.

For the following documents, when signed by representatives, tenderers must provide evidence for the delegation of the authorisation to sign:

- The Declaration on Honour of the tenderer (in case of joint tender – the Declarations on Honour of all group members);
- (If applicable – in the case of joint tender) the power(s) of attorney drawn up using the model attached in **Annex 3**).

4.4 Confidentiality of tenders: what information and under what conditions can be disclosed?

Once the *EGI FOUNDATION* has opened a tender, it becomes its property and shall be treatedconfidentially, subject to the following:

- For the purposes of evaluating the tender and, if applicable, implementing the contract, performing audits, benchmarking, etc., the *EGI FOUNDATION* is entitled to make available (any part of) the tender to its staff, as well to other persons and entities working for the *EGI FOUNDATION* or cooperating with it in the EOSC Future Project, including contractors or subcontractors and their staff provided that they are bound by an obligation of confidentiality. Regarding the evaluation, EGI will have an evaluation committee made up of:

  - Elisa Cauhe, EOSC DIH Coordinator, Strategy and Innovation Officer at EGI Foundation (President)
  - Dr. Eng. Damian Józefczyk Poznań University of Life Sciences (Secretary)
  - Dr. Eng. Nikos Vogiatzis, EOSC DIH monitorization and Impact evaluation (Member)

- After the signature of the award decision tenderers whose tenders were received in accordance with the submission modalities, who have access to procurement, who are not found to be in an exclusion situation referred to in Article 57 of DIRECTIVE 2014/24/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 26 February 2014 on public procurement, whose tenders are not found to be incompliant with the procurement documents, and who make a request in writing will be notified of the name of the tenderer to whom the contract is awarded, the characteristics and relative advantages of the successful tender and the price of the offer and/or contract value. The *EGI FOUNDATION* may decide to withhold certain information that it assesses as being confidential, in particular where its release would prejudice the legitimate commercial interests of economic operators or might distort fair competition between them. Such information may include, without being limited to, confidential aspects of tenders such as unit prices included in the financial offer, technical or trade secrets.

- The *EGI FOUNDATION* may disclose the submitted tender in the context of a request for public access to documents, or in other cases where the applicable law requires its disclosure. Unless there is an overriding public interest in disclosure, the *EGI FOUNDATION* may refuse to provide full access to the submitted tender, redacting the parts (if any) that contain confidential information, the disclosure of which would underminethe protection of commercial interests of the tenderer, including intellectual property.

☞ The *EGI FOUNDATION* will disregard general statements that the whole tender or substantial parts of it contain confidential information. Tenderers need to mark clearly the information they consider confidential and explain why it may not be disclosed. The *EGI FOUNDATION* reserves the right to make its own assessment of the confidential nature of any information contained in the tender.

ANNEXES

Annex 0. List of documents to be submitted

Annex 1: Cover letter

Annex 2: Identification of the Tenderer

Annex 3: Power(s) of Attorney

Annex 4: Declaration on Honour

Annex 5: Economic and Financial Capacity

Annex 6: List of previous projects

Annex 7: Commitment Letter

Annex 8.1: Technical Offer. Part I

Annex 8.2: Technical Offer. Part II

Annex 9: Financial Tender Form