

Requirements Collection

for Open Data Cloud Platform

EMSO

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| **Version: v1.0** |  |
| **Document Link:** |  |

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# Appendix Requirement ExtractiOn Template

A.0 Purpose and Scope of the investigation

*This section is input by a requirement collector to explain the purpose and scope of the investigation to an inquiry community, explaining the instructions of how to fill the template, and to keep records of the status of the requirement collection progress.*

****A.0.1 Authors****

*All authors contributing***directly***to this focus. Incrementally add names here as people actually contribute.*

|  |  |  |  |
| --- | --- | --- | --- |
| **Roles** | **Contact Person** | **Organization** | **Contact email** |
| Project Leader | Tiziana Ferrari | EGI.eu | tiziana.ferrari@egi.eu |
| Technology Provider | Lukasz Dutka | Cyfronet | lukasz.dutka@cyfronet.pl |
| Requirement Collector | Bartosz Kryza | Cyfronet | bkryza@agh.edu.pl |
| Requirement Collector | Yin Chen | EGI.eu | yin.chen@egi.eu |
|  |  |  |  |

****A.0.2 Purpose and Scope****

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| --- |
| **Purpose** *(Please describe the background, objectives and purpose of this requirement collection activities.)* |
| This requirement collection activity is organized within EGI-Engage project, aiming to support the development of Open Data Platform (ODP). Based on this questionnaire Open Data Platform would like to identify the current requirements, challenges and expectations of the communities interested in making their data public within EGI framework. In particular the major aspects related to ODP that should be resolved through this questionnaire include:* What kind of data, in what formats and sizes is managed by the community?
* What are the life cycles of data created within the community?
* What are the current data management and transfer technologies used within the community?
* What is the preferred way for users outside of community to access public community data?
* What are the potential use cases for public users to access community data (e.g. verification, simulation, visualization, etc.)
 |
| **Scope** *(By discussing with the technology provider teams, please briefly describe the technology to be provided, and intended inquiring areas)* |
| An Open Data Platform (ODP) will be designed to foster the discovery, dissemination and exploitation of open data in cloud environments, also addressing the problem of co-location of data and computing for big data processing. Open Data Platform will provide a distributed data management solution allowing communities to manage data according to their Data Management Plans, including publishing data to selected communities or public within certain time frames (e.g. after 1 year from creation). ODP will be based on onedata data management solution (<http://www.onedata.org>). |
| Expectations(*By discussing with the technology provider teams, summarise any special expectations they would want to notify the requirement collection team)* |
|  |
| **Information approved by** | Lukasz Dutka |

****A.0.3 Status of the requirement collection****

|  |  |  |  |
| --- | --- | --- | --- |
| **Description of the activities** | **Status** | **Responsible Person** | **Date** |
| Prepare the template | PENDING | Yin Chen, Bartosz Kryza | 10 Jul 2015 |
| Technical details are approved by the technology provider | PENDING | Lukasz Dutka | 13 Jul 2015 |
| Information is filled based on available material | GATHERING | Bartosz Kryza | 21 Jul 2015 |
| Requirements reviewed by internal team | REVIEWING | Yin Chen | 27 Jul 2015 |
| Send to the community for confirming | CONFIRMING | Yin Chen | 27 Jul 2015 |
| Get approvals from the community | ACCEPTED |  |  |
| Complete information collection | COMPLETE |  |  |

* **PENDING**: Requirement gatherers have been identified but have yet to start work.
* **GATHERING**: Information about the requirement is being gathered and recorded.
* **COMPLETE**: Gathering / recording information about the requirement has been completed.
* **REVIEWING**: The information is being reviewed and cleaned up, internally by the team.
* **CONFIRMING**: Information about the requirement is being reviewed / confirmed by communities and experts. (The name of such a person shall be provided at the end of each session indicated filed).
* **ACCEPTED**: Information about the requirement is complete, accurate and accepted as correct by all stakeholders.
* **STOPPED**: Work on this topic has been interrupted for the reason specified.

A.1 Science ViEWpoint

*Science viewpoint concerns community objectives to be achieved through the collaboration, and the details of use cases related to the technology to be provided. Information in this section needs helps and approvals from Research Managers of the user community.*

**A.1.1 Community Information**

|  |  |
| --- | --- |
| **Community Name** | European Multidisciplinary Seafloor & Water Column Observatory |
| Community Short Name if any | EMSO |
| Community Website | http://www.emso-eu.org |
| **Community Description**  | EMSO is a large-scale **European Research Infrastructure** in the field of environmental sciences. EMSO is based on a European-scale distributed research infrastructure of[**seafloor observatories**](http://www.emso-eu.org/infrastructure/what-are-ocean-observatories.html) with the basic scientific objective of long-term monitoring, mainly in real-time, of environmental processes related to the interaction between the geosphere, biosphere, and hydrosphere, including natural hazards. It is composed of several deep-seafloor observatories, which will be deployed on specific sites around European waters, reaching from the Arctic to the Black Sea passing through the Mediterranean Sea, thus forming a widely distributed pan-European infrastructure. *(from http://www.emso-eu.org)* |
| **Community Objectives** | * Real-time monitoring of interactions between geosphere, hydrosphere and biosphere
 |
| **Main Contact Institutions** | <*input here*> |
| **Main Contact**(*name and email*) | <*input here*> |
| Prior requirement capture activities and ideally a summary and references to their outcome | <*input here*> |
| Upload copies of files and provide links to them | <*input here*> |
| Cite papers | <*input here*> |

**A.1.2 Collaborations with Open Data Cloud Project**

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| **Scientific challenges** (*Please describe your problems and motivations for the collaboration with* ***Open Data Platform***) |
| * How to move data from harbour sites with sensors to the Grid sites (currently it is done using cron and rsync jobs)
* How to maintain data visibility
* How to ensure long-term preservation of data
* How to protect data integrity
* How to guarantee data authenticity
* How to maintain context and provenance information
* How to protect privacy and rights in complex data world
* How to maintain trust in data
* How to federate repositories to (virtually) integrate data
* How to achieve (partial) interoperability[[1]](#footnote-1)
 |
| **Objectives** (*Please describe your objectives to be achieved through collaboration with* ***Open Data Platform****)* |
| * To provide open access and shared tools for collaborative studies with state-of-the-art analysis algorithms.
 |
| Expectations *(please describe your expectations for the new technology to be provided by the* ***Open Data Platform****)* |
| <*input here*> |
| Impacts and Benefits (*Please be specific and use quantified indicators and targets wherever possible*) |
| <*Input here*> |
| *KPI inputs**(Please indicate as realistic as possible the expected results)* |
| *Area* | *Impact Description* | *KPI Values* |
| *Access* | *Increased access and usage of e-Infrastructures by scientific communities, simplifying the “embracing” of e-Science.*  | * *Number of users of the web portals: <input here>*
* *Number of sites provide the services:* <*input here*>
 |
| *Usability* | *Simplifying deployment of the web portals in cloud resources* | * *Number of downloads:* **<***input here***>**
 |
| *Impact on Policy* | *Policy impact depends on the successful generation and dissemination of relevant knowledge that can be used for policy formulation at the EU, or national level.*  | **<***input here***>** |
| *Visibility* | *Visibility of the project among scientists, technology providers and resource managers at high level.* | * *Number of citations of the software* **<***input here***>**
* *Number of portal cloud installations/usage:* **<***input here***>**
* *Advertisement at events/conferences/workshops:* **<***input here***>**
 |
| *Knowledge Impact* | *Knowledge impact creation: The impact on knowledge creation and dissemination of knowledge generated in the project depends on a high level of activity in dissemination to* *the proper groups.* | * *Number of journal publications acknowledging the project:* **<***input here***>**
* *Number of conference papers and presentations*: **<***input here***>**
 |
| Exploitation plans *(Please describe the exploitation plans related to this Case Study, e.g., summarize the potential stakeholders (public, private, international, etc.) and relate them with the exploitation possibilities)* |
| <*input here*> |

**A.1.3 Case Study**

*A* ***Case Study*** *is an implementation of a research method involving an up-close, in-depth, and detailed examination of a subject of study (the case), as well as its related contextual conditions. The Case Study will be based on a set of* ***User Stories****, i.e. how the researcher describes the steps to solve each part of the problem addressed.* ***In practice, the selection of the use stories shall be representative reflecting both of the research challenge and complexity, and of the possible solutions offered by the Open Data Platform****.* ***User Stories*** *are the starting point of* ***Use Cases****, where they are transformed into a description using software engineering terms (like the actors, scenario, preconditions, etc.* ***Use Cases*** *are useful to capture the requirements that will be handled by the technology provider, and can be tracked, e.g., by a Backlog system from an OpenProject tool[[2]](#footnote-2).*

|  |
| --- |
| ***User Stories (****Please describe use stories, selecting those only related to the Open data platform technology, describe who (actor) wants to do what, need what services/functions and handle what information objects (data, metadata, signals etc., indicate related community policies and constraints, e.g. on data publication, access, preservations, etc.)* |
| **<***input here***>** |

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| --- | --- |
| **Information approved by** | <*input here*> |

A.2 Information Viewpoint

*Information viewpoint concerns data object model and data lifecycle in the system. This section of questionnaire should provide the information on the data content, data formats and data lifecycles used in the community without specifying particular technologies and platforms used for data management. Information in this section needs inputs and approvals from data managers of the user community.*

**A.2.1 Data**

|  |
| --- |
| ***Current status*** |
| **Data Object types** (*Please list data object types in current system,* *e.g., level 1 data, level 2 data, raw data, aggregated data, simulation data, etc. and give definition/description of them*) |
| * RAW data from hydrophone sensors, readonly (~11TB/month)
* Preprocessed data stored in MOISTdb
 |
| **Data size** *(typical size of single file or object)* | <*input here*> |
| **Data collection size** *(estimate of total size of data collection in community)* | ~11TB/month |
| **Data format***(e.g. XML, CSV)* | SDN (SeaDataNet) |
| Data Identifiers *(how is the data objects/files identified)* | **<***input here***>** |
| Standards in use (e.g. FITS, DICOM) | <*input here*> |
| Data locations (&contacts) | <*input here*> |
| Data management plan *(How long should the data be preserved? When can it be made public?)* | **<***input here***>** |
| **Privacy policy** *(Who can access the data?)* | <*input here*> |
| Other aspects | **<***input here***>** |
| *Future Requirements* |
| **<***input here***>** |

**A.2.2 Metadata**

|  |
| --- |
| ***Current Status*** |
| **Metadata object types** (*Please list metadata object types in current system,* *e.g, metadata for level1 data, metadata for processing data, etc. and give definition/description of them*) |
| <*input here*> |
| Metadata Identifiers | **<***input here***>** |
| Metadata size | <*input here*> |
| Metadata format | **<***input here***>** |
| Standards in use | <*input here*> |
| Metadata generation | **<***input here***>** |
| Metadata locations (&contacts) | **<***input here***>** |
| Other aspects | **<***input here***>** |
| *Future Requirements* |
| **<***input here***>** |

**A.2.3 Data Lifecycle**

|  |
| --- |
| *Current Status* |
| Data Lifecycle (*Please describe the dataflow in current system, indicate explicitly what data object change from which state to which state after what functions/action applied to the data object. E.g., level 1 data become level 2 data after quality checking. Use figure wherever possible.*) |
| * Raw data is first collected from underwater sensors and should be stored in read only files in Tier 0 systems close to the harbours
* This data is then pre-processed and stored in MOISTdb
 |
| *Future Requirements* |
| **<***input here***>** |

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| **Information approved by** | **<***input here***>** |

A.3 TECHNOLOGY Viewpoint

*Technology viewpoint concerns how the data specified in information viewpoint is managed currently in the community. Questionnaire should provide information what technologies are used to store, transfer, access, process and secure the community data sets.*

**A.3.1 General aspects**

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| --- |
| *Current status* |
| System Architecture (*please describe how the functionalities are distributed onto current physical devices, use figure if possible*) |
| The computing and data management architecture of EMSO should be similar to the one adopted by the LHC community with a layered (tiered) structure. Tier 0’s will be created as close as possible to the experimental sites and will host raw data, Tier 1’s will host replicas of the data needed for the analysis and will run analysis jobs. Once the infrastructure is set up at the European level the idea is to create a service, which will act as a broker, it will receive user requests (for data and analysis) and will dispatch them to the appropriate grid resources.Preprocessed data are also inserted into a dedicated DB (MOISTdb), which should be Grid enabled in the future. LNS (or INFN Catania) will be the first EMSO T0 (INFN-CATANIA was chosen). Data hosted on that site had to be accessed by the whole EMSO collaboration but in a first phase only by colleagues located in ROMA1, PAVIA, MILAN and LNS/CATANIA. The storage currently available to EMSO at LNS is 80TB that will host RAW data and should be griddified, making this space visible by a Grid SE. Currently only local account can access it. *(from https://wiki.italiangrid.it/twiki/bin/view/UserSupport/EMSOGrid)* |
| Data management (Please describe how you access and manage your data sets) |
| **Community data access protocols** *(e.g. POSIX, GridFTP, WebDAV)* | rsync |
| **Data management technology** *(Please describe what is the data management system in your community, e.g. LFC, iRODS, etc.)* | LFC |
| **Data access control** *(e.g. POSIX filesystem rights, ACL)*  | <*input here*> |
| **Public data access protocol** *(How should the data be accessed by public users? e.g. HTTP)* | <*input here*> |
| **Public authentication mechanism** *(e.g. anonymous access, track who downloaded file based on X.509 certs)* | <*input here*> |
| Computing capacities *(Please describe the type and capacities of current physical devices used for your data processing)* |
| CPU | <*input here*> |
| GPU | <*input here*> |
| RAM  | <*input here*> |
| Storage *e.g., HDD, tapes* | 80TB |
| Network | <*input here*> |
| e-Infrastructure, *e.g., Clusters, Grid, Cloud, Supercomputing resources* | Grid |
| Client, *e.g., workstation, desktop, laptop, Mobile device, etc.* | <*input here*> |
| *Other aspects* | <*input here*> |
| *Future requirements* |
| **<***input here***>** |

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**A.3.2 Non-functional requirements**

*This subsection should provide some information about the non-functional requirements related to data management of the data in the community and in case when the data is made open to the public.*

|  |  |  |
| --- | --- | --- |
| Performance Requirements | Requirement Levels | Description (*please describe performance requirements for the required system*) |
| High | Middle | Normal |
| Availability | <Y/N> | <Y/N> | <Y/N> | <input here> |
| Accessibility | <Y/N> | <Y/N> | <Y/N> | <input here> |
| Throughput | <Y/N> | <Y/N> | <Y/N> | <input here> |
| Response time | <Y/N> | <Y/N> | <Y/N> | <input here> |
| Security | <Y/N> | <Y/N> | <Y/N> | <input here> |
| Utility | <Y/N> | <Y/N> | <Y/N> | <input here> |
| Reliability | <Y/N> | <Y/N> | <Y/N> | <input here> |
| Scalability | <Y/N> | <Y/N> | <Y/N> | <input here> |
| Efficiency | <Y/N> | <Y/N> | <Y/N> | <input here> |
| Disaster recovery | <Y/N> | <Y/N> | <Y/N> | <input here> |
| ***Others performance requirements*** |
| <*input here*> | <Y/N> | <Y/N> | <Y/N> | <*input here*> |
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**A.3.3 Software and applications in use**

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| --- | --- |
| Software/ applications/services  | * *Describe the software/applications/services name, version:* **<***input here***>**
* *Describe the software licensing:* **<***input here***>**
* *Describe the configuration:* **<***input here***>**
* *Describe the dependencies needed to run the application, indicating origin and requirements:* **<***input here***>**
 |
| Operating system | <*input here*> |
| Runtime libraries/APIs *(e.g., Java, C++, Python, etc.)*  | <*input here*> |
| Typical processing time | <*input here*> |

**A.3.4 e-Infrastructure in use**

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| **e-Infrastructure resources being used or planned to be used**. *Please indicate from the point of view of the research community if the current solution is already using an e-Infrastructure (like GEANT, EGI, PRACE, EUDAT, a Cloud provider, etc.) and if so what middleware is used. If relevant, detail which centres support it and what level of resources are used (in terms of million-hours of CPU, Terabytes of storage, network bandwidth, etc.).* |
| EGI |

**A.3.5 Requirements for EGI Testbed Establishments**

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| --- |
| *Does the case include preferences on specific tools and technologies to use? For example: grid access to HTC clusters with gLite; Cloud access to OpenStack sites; Access to clusters via standard interfaces; Access to image analysis tools via Web portal* |
| gLite |
| *Does the user have preferences on specific resource providers? (e.g. in certain countries, regions or sites)*  |
| <*input here*> |
| *Approximately how much compute and storage capacity and for how long time is needed? (may be irrelevant if the activity is for example assessment of an EGI technology)* |
| <*input here*> |
| *Does the user (or those he/she represents) have access to a Certification Authority? (to obtain an EGI certificate)* |
| Yes, INFN CA. |
| *Does the user need access to an existing allocation (🡪 join existing VO), or does he/she needs a new allocation? (🡪 create a new VO)* |
| The Italian catch-all GRIDIT VO is currently used |
| *Does the user (or those he/she represent) have the resources, time and skills to manage an EGI VO?*  |
| <*input here*> |
| *Which NGIs are interested in supporting this case? (Question to the NGIs)* |
| <*input here*> |

|  |  |
| --- | --- |
| **Information approved by** | <*input here*> |

1. http://www.emso-eu.org/images/documents/EMSO\_Conference\_13\_15\_November\_2013/presentations/Data%20and%20Analysis%20Tools,%20Plans%20and%20Contributions%20-%20Waldmann.pdf [↑](#footnote-ref-1)
2. <https://www.openproject.org/> [↑](#footnote-ref-2)