IC_12 Implementation of ENVRI RM for EUFAR and LTER

1. Background

1.1 Short description

The key purpose of this implementation case is to describe two RIs with in part very different framework requirements using the ENVRI Reference Model (RM). The RM provides a common language which promotes structural thinking in constructions of system architectures and can be used as a research tool for comparison and analysis of different technologies and solutions to guide design and implementation activities, and to drive the development of common services.
EUFAR (European Facility for Airborne Research) is an Integrating Activity of the 7th Framework Programme (FP7) of the EC covering the period from 2014-2018. The current EUFAR follows three previous contracts under FP5, FP6 and FP7, and currently represents a consortium of 24 European institutions and organisations involved in airborne research. It is a unique pan-European portal and network for airborne research infrastructures dedicated to environmental sciences. EUFAR works to coordinate the operation of instrumented aircraft and remote sensing instruments, exploiting the skills of experts in airborne measurements in the fields of environmental and geo-sciences, in order to provide researchers with the infrastructure best suited to their needs.
LTER (Long-Term Ecosystem Research) is a global effort aiming at providing information on ecosystem functioning and processes as well as related drivers and pressures on ecosystem scale (e.g. a watershed). The data collected cover a wide range of domains, and are despite many standardisations still very diverse in its technical formats (e.g. mapping campaigns, sensor based data, aerial photographs, recordings, pictures). The purpose of the European eLTER RI (as part of LTER Europe) is to focus on the provision of standardised and harmonized data products across different biographic and ecosystem gradients. It is characterised by distributed data acquisition and management (e.g. data repositories and metadata provision), taking place at the different long term observation sties, and central facilities like metadata catalogue harvesting metadata from data nodes (under development) and site documentation (DEIMS Site Registry). Data acquisition and quality control is done by the single sites.
The ENVRI Reference Model (ENVRI-RM) is an abstract model developed by ENVRI[1] ("**Common Operations of Environmental Research Infrastructures**"), a project co-funded by the European Commission as a Coordination and Support Action within the 7th Framework Programme on which the current project is based. ENVRI-RM is a set of concepts and terms capturing a set of requirements of environmental research infrastructures. Built on top of the Open Distributed Processing (ODP) framework, the Reference Model defines functional elements, data flow and dependencies that are common to research infrastructures considered in ENVRI. The Reference Model can be used as the foundation for building reference architectures, and concrete implementations can be derived.
The ENVRIPLUS RM will extend this approach by including latest conceptual and technological updates from RIs. Including EUFAR in this context helps to improve the quality of the reference model and on the other side to spread this knowledge repository beyond the ENVRIPLUS community. In addition it is beneficial to EUFAR's own architecture and data flow. For LTER Europe a second description of the RI with the improved ENVRI RM will be performed. In addition it will link to the ongoing eLTER project which works inter-alia towards an improved LTER Europe data infrastructure. The ENVRIPLUS RM will help to identify and describe the different components of this data infrastructure in a standardised manner in order to compare it with related RIs, like ICOS.

1.2 Contact

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1.3 Use case type

Implementation case

1.4 Scientific domain and communities

Scientific domain

EUFAR -all: Atmosphere | Biosphere | hydrosphere | geosphere
LTER-all: Atmosphere | Biosphere | hydrosphere | geosphere

Community

All communities *[Data Acquisition | Data Curation | Data Publication | Data Service Provision | Data Usage]*

Behavior

To be elaborated within the implementation case, but it is likely that most of them are touched.

2. Detailed description

Objective and Impact

The objective of this implementation case is to describe the processes within EUFAR and LTER infrastructures using the ENVRI Reference Model (RM). The RM provides a set of ready-to-use terminology with a publicly-accessible reference base. This can be used to describe requirements and architectural features of the infrastructure, and serve as a common language in communication materials. Being a uniform framework with well-defined subsystems of components specified from different complementary viewpoints (Science, Information and Computation) the RM promotes structural thinking in constructions of system architectures and can be used as a research tool for comparison and analysis of different technologies and solutions to guide design and implementation activities, and to drive the development of common services.
While describing EUFAR and LTER with the ENVRI RM it will become evident that the existing reference model comes to its limitations. To make them visible helps to address the weaknesses and missing parts which will foster an improvement of the existing viewpoints and support the development of the missing viewpoints. This collaboration will have a very important impact in the release of the revised and optimized ENVRI Reference Model. Being part of the ENVRIplus consortium it will be possible for LTER to repeat the description with the new release of the ENVRI RM in the third year of the project and thus help to demonstrate its added value.

Challenges

The main challenge are the use of the existing RM to describe the current situation of EUFAR / LTER and the identification of the optimization possibilities of the RIs data architecture, workflow and technical implementations. On the other side, also the current Reference Model is not complete as two viewpoints are missing. The description of the RIs' will be based on this version whereas the RM will be further developed. This might become a problem at a certain stage but it can also be trigger to accelerate the improvement of the model.
On the other hand repeating this exercise for LTER with the new release will reduce this risk of limitations and incompleteness.

Detailed scenarios

The Mid-Term Review and EUFAR's 3rd General Assembly meeting will be held in Prague first week of April 2016. This will be the kick off for the implementation case because it will be a good opportunity to define the frame of the requirements this case should meet. For any other following meetings in the course of the foundation activity the RM will be used as common vocabulary to facilitate the collaboration between the different parts of the community.
To assure the continuity of EUFAR beyond the end of the current project, EUFAR is in the progress of establishing a sustainable legal structure (an International non-profit Association under the Belgian law - AISBL). The AISBL is the way forward for multi-national infrastructure networks and is a key step to enable EUFAR to develop more straightforward ways of accessing aircraft across Europe and to develop more efficient use of the existing facilities. The RM will be used to support these developments and to identify the points for improvement.
The current H2020 eLTER project is working on the development of a Long-Term Ecosystem Research Infrastructure in Europe. A close link and interaction between the eLTER and the ENVRI+ project will allow for a joint development. In a virtual coordination team meeting the kick off for the implementation case will be initiated. This will take place mid April. The implementation and review of the RM will be done in a series of meetings.
The eLTER project supports LTER Europe as European scale network as well as the eLTER ESFRI process to establish a legal ESFRI infrastructure. By this the continuity of the work will be guaranteed as it will fit into the further development steps of the RI.

Technical status and requirements

The actual ENVRI Reference Model has to be revised in coming next 9 months. It is composed by three viewpoints (science, information and computational viewpoint, two other (technology and engineering viewpoint) will be added.
As mentioned before the implementation case will start working with the existing RM and will help to improve it by outlining missing parts.
For LTER it will be additionally possible to use the new version to improve its description.

Implementation plan and timetable

1)timeline:
start: April 2016

- EUFAR's 3rd general Assembly: decision about which parts we should focus on
- eLTER virtual coordination meeting as kick-off of the process for the LTER Europe community

May 2016 - presentation of EUFAR/LTER implementation case at the ENVRIWeek
June 2016

- presentation and discussion of EUFAR workflow description with ENVRI RM within the EUFAR consortium, and subsequently revision where necessary
- Presentation and discussion of the implementation of the ENVRI RM with the eLTER Data Management community at the eLTER project meeting (Riga, LT)

August 2016: Identification of RI's weaknesses and ENVRI RM limitations
September 2016: Recommendation for the Improvement of EUFAR's and LTER Europes data infrastructure, workflow and technical implementations
May 2017: Presentation of revised description of LTER with the updated ENVRI RM at the 4th ENVRI+ Week
2) milestones:
July 2016: First description of the EUFAR and LTER workflows with ENVRI RM
September 2016: Limits and Weaknesses of ENVRI RM detected
September - December 2016: Give input to the new development of ENVRI RM
May 2017: Revised description of LTER with updated ENVRI RM
3) involved RIs:

- EUFAR,
- LTER Europe (eLTER)

4) links to ENVRI+ work packages / task: W

- P 5 Task 5.2

5) allocation of resources:

- EEA (3 PM), DLR (additional 2 PM requested)

(as Barbara Magagna is involved in the development of the RM and in LTER anyway the costs for this implementation case can be used very efficiently)

Expected output and evaluation of output

The expected output is a considerable help in the preparation of EUFAR in the process of establishment towards a sustainable legal structure. This will become clear evaluable during the different establishing meetings through well prepared questionnaires answered by the participating members. The impact on the development of the eLTER RI will be evaluated during the key meetings of eLTER H2020 project where the results of the two descriptions will be presented and assessed by the present audience by means of prepared questionnaires.

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[1] ENVRI has received funding from the European Community's Seventh Framework Programme (FP7/2007-2013) under grant agreement n°283465

External Links:

1. IC_12 Notebook: {+}https://envriplus.manageprojects.com/projects/wp9-service-validation-and-deployment-1/notebooks/654+