EOSC Future

Keywords:
#data, #app, #sensor, #citizenscience, #citizenobservatory, #mobile, #EOSCinPractice #cross-disciplinary

Connecting researchers, developers and citizen scientists in a unique mobile app environment.

An EOSC in Practice Story where heterogeneous data are collected via mobiles or sensors, and made accessible in a secure, open and easy way.

The project involved

Cos4Cloud

Cos4Cloud **(Co-designing Citizen Observatories Services for the EOS-Cloud)** is a European Horizon 2020 project funded under Grant Agreement no 863463. The project aims at boosting citizen science technologies. One of the biggest challenges of citizen science is the **quality of data**, as well as maintaining the citizen observatories used to collect this data. Cos4Cloud is addressing these challenges by developing twelve technological services to improve citizen science platforms.

The Users

This EOSC in practice story targets three main types of users: (1) the **citizen and citizen scientists** who collect valuable data, (2) the **researchers** who use and benefit from the data collected by citizens via smartphones and sensors, and (3) **software developers**.

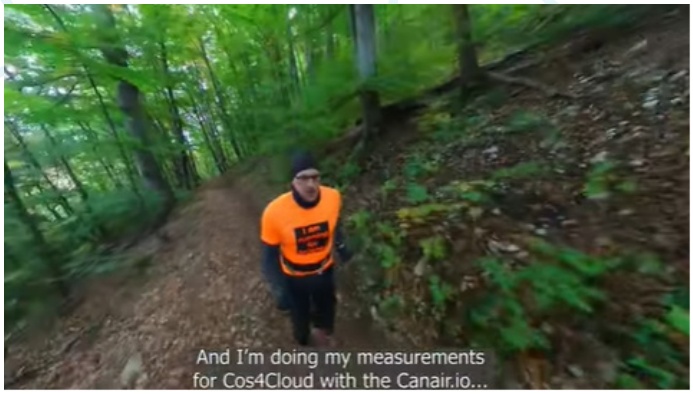
The Challenge

Currently there are **thousands of citizen science apps constituting a fragmented ecosystem**. Each app comes indeed with its own login system and with a separate database accessible to specific groups of researchers. Most of these apps are still listed in app stores, but are actually abandoned, since they were created only for the purpose of a project. Beyond all concerns coming from these apps being unsustainable, it is also frustrating and time consuming to use them in such a disaggregated manner: users need to login multiple times, face the complexity of having data stored in different places and with different formats. **An integration service is what could solve such problems.**

"What we frequently experience with funded projects is their time limitation. Projects last mostly 4 years, then they end, the funding ends… and the community is gone. This is why we really started early in the project to think about its future sustainability"

Norbert Schmidt, Owner @DDQ & Partner @Cos4Cloud

The solution



A MOBIS user measuring air quality near Brasov (Romania)

The proposed solution is called **MOBIS (Mobile Observation Integration Service)** and it provides a service that makes it easier to gather all kinds of data, and keep them open. MOBIS collects and processes data from different mobile observatories (most of them via smartphones with or without sensors). It can be used as a back end service for (citizen-) science apps with a single login. MOBIS is openly available to researchers & citizens. The final aim is for MOBIS to become a large repository for citizen science data, including environmental and bio diversity data or air and water quality measurement, to give a few examples. MOBIS can combine a multitude of heterogeneous data, offer interoperability with other apps and take care of GDPR compliance regarding the (re-)use of data and images. As of today, three citizen apps are already integrated with MOBIS.

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The service provider

The MOBIS service is provided by DDQ: Pocket Science , a small Dutch company specialised in the development of mobile-based (citizen-) science applications with research partners worldwide. The company also offers smartphone back ends to facilitate mobile cloud computing, machine learning, user notifications, storage and offline synchronisation for working in remote areas. DDQ is an EOSC provider, whose services are hosted on the EGI High Performance Infrastructure. DDQ has developed MOBIS in the Cos4Cloud framework.

Why do I need EOSC?

MOBIS service brings the following benefits to its users thanks to its presence on the EOSC Portal Catalogue and Marketplace :

» unique mobile repository for research data accessible throughout Europe
» integration of heterogeneous data
» integration of multiple apps & easy onboarding process with minor devlopment skills required
» GDPR compliance

At the same time such a service provides the following benefits to the provider:

» New partnership opportunities
» Further visibility at European level

You can Access MOBIS on EOSC Portal Catalogue and Marketplace here

The impact on society

MOBIS' effect on society is to facilitate the interest and participation of **multiple users in science** in the short run. In the long run, the idea is to provide continued support for this service to still exist after the project ends, so that the involvement of users into science through the sharing of a complete open set of cross-disciplinary data can be sustained and grow over time. But there is more: accessing precise data about the environment can be used to monitor problems such as pollution in cities. Municipalities can access this information and take policy decisions to improve cities' liveability. This is just one example of the many impactful consequences of investing in a long-term open data storage and sharing service like MOBIS.

Across disciplines

This EOSC in practice story showcases cross-disciplinarity, given that the types of data that can be collected and shared via MOBIS encompass various fields, such as astronomy, environment and biodiversity.

Future developments

In its future versions, MOBIS will likely be improved with the addition of Machine Learning techniques, able to leverage on Artificial Intelligence to detect, for instance, the quality of water or other subjects by analysing its colour. More technological updates will possibly follow, including the use of quantum computing. Such developments will serve researchers, providing additional insights on the collected images and data, speeding up computing times and boosting efficiency via automation of some phases, such as image detection and recognition.

Sustainability for an EOSC in practice

Creating a sustainable service was one of the real triggers for MOBIS creation in the fragmented mobile app landscape. Cos4Cloud has equipped MOBIS with a sustainability plan being continuously updated which includes:

» the intention to have MOBIS hosted beyond the project's end. Possible options include keeping MOBIS on the EGI-ACE infrastructure or shifting MOBIS to the EOSC Exchange, provided that both data storage and adequate processing power are provided to support MOBIS service in both scenarios.
» The request of maintenance fees to apps that wish to stay onboarded on the MOBIS Framework. DDQ will carry out the fees through individual Service Level Agreements (SLAs). Some are already in place with citizen observatories.

Future funding model scenarios

Although a specific pricing for the maintenance of onboarded apps has not been defined yet, it is envisioned that the required fees will be asked to citizen science projects and citizen observatories and depend on the app requirements and functionalities. Some apps generate enormous datasets and require large storage and processing power, while other apps are doing most of the processing on the phone or are only data-entry apps, the fee will be of approximately 1.000€ per year for apps with basic requirements and increase with the complexity of requirements, such as dedicated back-end services, dashboarding, scripting, notification, connection to Artificial Intelligence or Machine Learning modules.

In addition, DDQ: Pocket Science is looking for and already partnering with other open data initiatives, including EOSC-related ones. The objective is to build a business roadmap for growth and sustainability by April 2022, which is focused on products and services instead of projects and assignments.

Useful material related to this story

» MOBIS: An EOSC service to create integrative environmental and biodiversity citizen science apps
» Run4Science, a set of MOBIS use cases where passionate sports persons perform in field data acquisition in raw natural spots
» MOBIS Framework

Want to learn more about the other services being developed by **Cos4Cloud**? Read here

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