Design and Development of Interoperable Cloud Sensor Services to Support Citizen Science Projects

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Citizen Observatories are becoming a more and more popular source of input data in many scientific domains. This includes for example research on biodiversity (e.g. counts of specific species in an area of interest), air quality monitoring (e.g. low-cost sensor boxes), or traffic flow analysis (e.g. apps collecting floating car data).

For the collection of such data, different approaches exist. Besides frameworks providing re-usable software building blocks (e.g. wq framework, Open Data Kit), many projects rely on custom developments. However, these solutions are mainly focused on providing the necessary software components. Further work is necessary to set-up the necessary IT infrastructure. In addition, aspects such as interoperability are usually less considered which often leads to the creation of isolated information silos.

In our presentation, we will introduce selected activities of the European H2020 project COS4CLOUD (Co-designed citizen observatories for the EOS-Cloud). Among other objectives, COS4CLOUD aims at providing re-usable services for setting up Citizen Observatories based on the European Open Science (EOS) Cloud. We will especially discuss how it will make use of interoperability standards such as the Sensor Observation Service (SOS), SensorThings API as well as Observations and Measurements (O&M) of the Open Geospatial Consortium (OGC).

As a result, COS4CLOUD will not only facilitate the collection of Citizen Observatory data by reducing the work necessary to set-up a corresponding IT infrastructure. It will also support the exchange and integration of Citizen Observatory data between different projects as well as the integration with other authoritative data sources. This shall increase the sustainability of data collection efforts as Citizen Science data may be used as input for many data analysis processes beyond the project that originally collected the data.