



## **Ensuring consistency and persistence to the Quality Information Model – The role of the GeoViQua Broker**

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GeoViQua (QUALity aware VISualisation for the Global Earth Observation System of Systems) is an FP7 project aiming at complementing the Global Earth Observation System of Systems (GEOSS) with rigorous data quality specifications and quality-aware capabilities, in order to improve reliability in scientific studies and policy decision-making.

GeoViQua main scientific and technical objective is to enhance the GEOSS Common Infrastructure (GCI) providing the user community with innovative quality-aware search and visualization tools, which will be integrated in the GEOPortal, as well as made available to other end-user interfaces.

To this end, GeoViQua will promote the extension of the current standard metadata for geographic information with accurate and expressive quality indicators. The project will also contribute to the definition of a quality label, the GEOLabel, reflecting scientific relevance, quality, acceptance and societal needs.

The concept of Quality Information is very broad. When talking about the quality of a product, this is not limited to geophysical quality but also includes concepts like mission quality (e.g. data coverage with respect to planning). In general, it provides an indication of the overall fitness for use of a specific type of product.

Employing and extending several ISO standards such as 19115, 19157 and 19139, a common set of data quality indicators has been selected to be used within the project. The resulting work, in the form of a data model, is expressed in XML Schema Language and encoded in XML. Quality information can be stated both by data producers and by data users, actually resulting in two conceptually distinct data models, the Producer Quality model and the User Quality model (or User Feedback model).

A very important issue concerns the association between the quality reports and the affected products that are target of the report. This association is usually achieved by means of a Product Identifier (PID), but actually just a few products are annotated with their PID; recent studies show that on a total of about 100000 Clearinghouse products, only 37 have the Product Identifier. Furthermore the association should be persistent within the GeoViQua scope.

GeoViQua architecture is built on the brokering approach successfully experimented within the EuroGEOSS project and realized by the GEO DAB (Discovery and Access Broker). Part of the GEOSS Common Infrastructure (GCI), the GEO DAB allows for harmonization and distribution in a transparent way for both users and data providers. This way, GeoViQua can effectively complement and extend the GEO DAB obtaining a Quality-augmentation broker (GeoViQua Broker) which plays a central role in ensuring the consistency of the Producer and User quality models.

This work is focused on the typical use case in which the GeoViQua Broker performs data discovery from different data providers, and then integrates in the Quality Information Model the producer quality report with the feedback given by users. In particular, this work highlights the problems faced by the GeoViQua Broker and the techniques adopted to ensure consistency and persistency also for quality reports whose target products are not annotated with a PID.

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