Sensor Web Developments in the ODIP II Project

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The availability of useful and appropriate observation and measurement data is a core requirement to answer ocean related scientific questions. Thus, there is an increase in the different types of sensors developed and deployed to capture the necessary data. At the same time this multitude of different sensing devices and technologies results in a higher risk of heterogeneous information silos which hinder the re-use of collected data across different organisations, applications and thematic disciplines.

To overcome the data integration issues resulting from heterogeneous systems, Sensor Web components are a promising approach to facilitate the interoperable sharing of marine observation data. Consequently, several European projects such as ODIP II (Ocean Data Interoperability Platform), SeaDataCloud, NeXOS, and BRIDGES contribute to the Sensor Web Enablement (SWE) development.

Among the above mentioned projects, ODIP II takes a cross-cutting role. One of its aims is to promote the interoperable sharing of marine observation data through Sensor Web technology and to harmonize the way Sensor Web concepts are applied in the marine science community. Its main role is to provide coordination of development activities that result in a series of prototypes evaluating and demonstrating SWE technology. Furthermore, ODIP 2 contributes to the harmonization between different SWE-related projects as well as to the advancement of vocabularies needed to provide semantically interoperable sensor metadata. For conducting these activities, ODIP II comprises a dedicated prototype development activity covering Sensor Web technology.

Within our contribution, the latest developments resulting from the ODIP II Sensor Web prototype development are illustrated. Especially the following topics will be covered:

a) Marine Sensor Web Enablement Profiles: Development of recommendations how to apply the Sensor Web Enablement standards of the Open Geospatial Consortium (OGC) for marine applications.

b) Semantic interoperability through the use of vocabularies: Development of an approach and encoding of SWE messages relying on controlled vocabularies. This comprises vocabularies needed for ensuring content-wise interoperability of OGC SensorML as well as Observations and Measurements (O&M) documents.

c) Integration of Internet of Things technologies: Prototypical integration of Internet of Things protocols (e.g. MQTT) with established Sensor Web components (e.g. MQTT-based feeding of live observation data into data archives).

d) Provision of Sensor Web metadata through interactive metadata editors that allow to generate SensorML-based metadata documents.

e) Sensor Web data visualisation tools: Web-based applications for consuming and exploring observation data from distributed Sensor Web infrastructures.

In summary, this contribution will provide a comprehensive overview of currently ongoing developments that help to promote and improve the Sensor Web-based sharing of marine observation data.