M3 REPRESENTING SENSORML AND O&M FILES IN ANDROID CLIENTS

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Abstract
The Citclops European Project aims to develop low-cost technologies to estimate parameters related to water optical properties. The wide variety of sensors involved makes it desirable to have a standardized description of the sensor itself and the data acquired by the sensor. This project presents a practical approach to modeling thess descriptions and the graphical representation of this information.

Keywords – SOS, SensorML, O&M, marine, Android, IoT, XML.

I. INTRODUCTION

This approach is implemented in the context of the European R+D+I Citclops [1] that aims to promote citizen participation in monitoring the status of marine waters, anyone can take pictures of the sea surface and upload them to an on-line platform for further interpretation of the color, transparency and water fluorescence. In addition to these observations obtained primarily through smartphones it will also feature other sensors deployed at particular points to provide data in a continuous and controlled way. The wide variety of sensors involved makes it desirable to have a standardized description of the sensor itself and the data acquired by the sensor. This project presents a practical approach to modeling these descriptions and the graphical representation of this information retrieved from a Sensor Observation Services information, SOS.

II. OBJECTIVES

The aim of this work lies in the growing interest in Sensor Web Enablement, SWE, and the difficulties encountered to get a friendly approach for the end user to access this sensor and observation descriptions consisting in a large and complex XML files.
Specifically this project try to represent as clear as possible for the end user the following information:
- SensorML files: These files get an accurate description of the sensors and sensor systems responsible for the acquisition of the observations.
- O&M files: these files contain a detailed description of the observations together with the values of the observation.
For the implementation of this project has been chosen to develop a client of SWE SensorML and O & M for mobile devices. Specifically, it hazs been developed an Android client suitable for be used in mobile phones and tablets.

III. IMPLEMENTATION

The cBuoy [2] it's an acquisition system developed under the Citclops project that is is a moored system that measure light irradiance at different depths. It's very important to have a description of cBuoy using a standardized way. SensorML [3] perfectly fits these needs. It's necessary to describe the sensor itself and the composition and relative position of the multiple irradiance sensors at different depths in the cBuoy system. The cBuoy it's a system of systems, all the instruments attached to the cBuoy have a relatively position referred to the global position of the cBuoy. To define the spatial reference frame and describe the relative position of each sensor we use sml:spatialReferenceFrame with CBUOY_FRAME and CBUOY_DATUM that defines a sml:position. Using this cBuoy spatial reference frame it's possible to reference the rest of the multiple irradiance sensors and other possible remote sensors that can be attached to the cBuoy.
Under the Citclops project perspective, as a Crowdsourcing [4] project that want to promote the participation of citizens in science it's very relevant to hide the complexity of the sensor descriptions using SensorML and at the same time to make accessible this information using smartphones. To transform SensorML files to a more understandable format, this approach transform the SensorML files using XSLT [5]. XSLT it's a language that transforms XML documents into other documents.
To retrieve the sensor description, SensorML, and the observation descriptions, O&M, we work with a very simple implementation of a Sensor Observation Service, SOS [6] with only a few interfaces: getCapabilities to describe the service, getObservation to retrieve the different kind of observations (instant observa-

tion, time interval observation or survey observation) and describeSensor to retrieve the sensor description.

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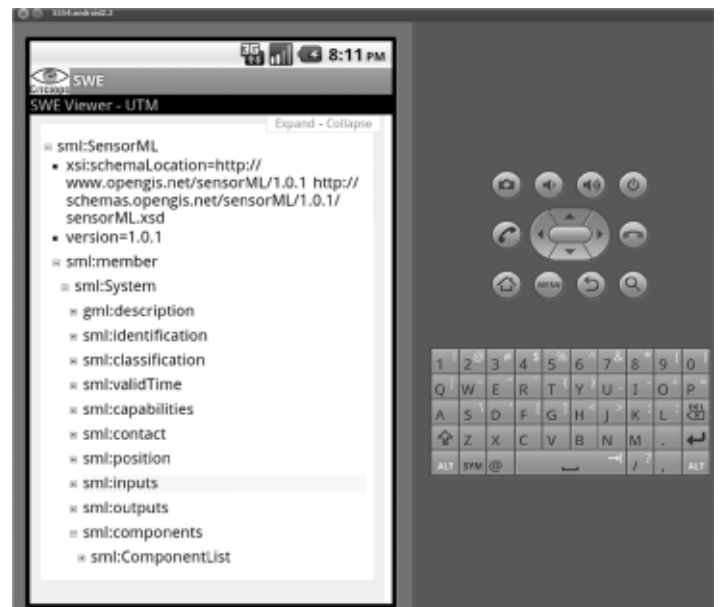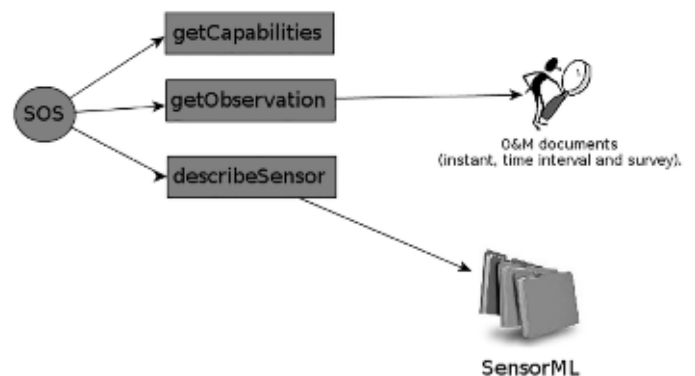*[5] www.opengeospatial.org/standards/sos [Accessed: 02/05/2013]*

Fig 1. : Accesing SensorML file from Android device.

Fig 2. : SOS implemented interfaces.