



Portable air quality sensor unit for participatory monitoring: an end-to-end VESNA-AQ based prototype

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Introduction

- VESNA-AQ is a portable air quality sensor unit that measures:
 - NO₂, O₃, CO (ppb)
 - Temperature (°C)
 - Relative Humidity (%)
 - Accelerometer
- VESNA based personal sensor unit supports wireless connection to an Android device via WiFi.
- The smartphone serves as the communication gateway towards the server.
- The application which supports participatory monitoring will enrich the data coming from the personal sensor unit with:
 - GPS location,
 - timestamps and
 - user defined context.

Architecture

- The VESNA air quality monitoring system comprises the VESNA personal sensor unit, smartphone app and the remote server.
- The smartphone app implements custom LCSP (Lightweight Client Server Protocol) protocol which is used to send requests to the sensor node.
- The mobile application has options:
 - to visualize the data on graphs or as raw values and
 - to forward the data to the server in custom-defined JSON structure.
- The server stores the data in the database, translates the data to WFS and forwards it to the remote Snowflake server over WFS-T in the XML format using HTTP POST request.

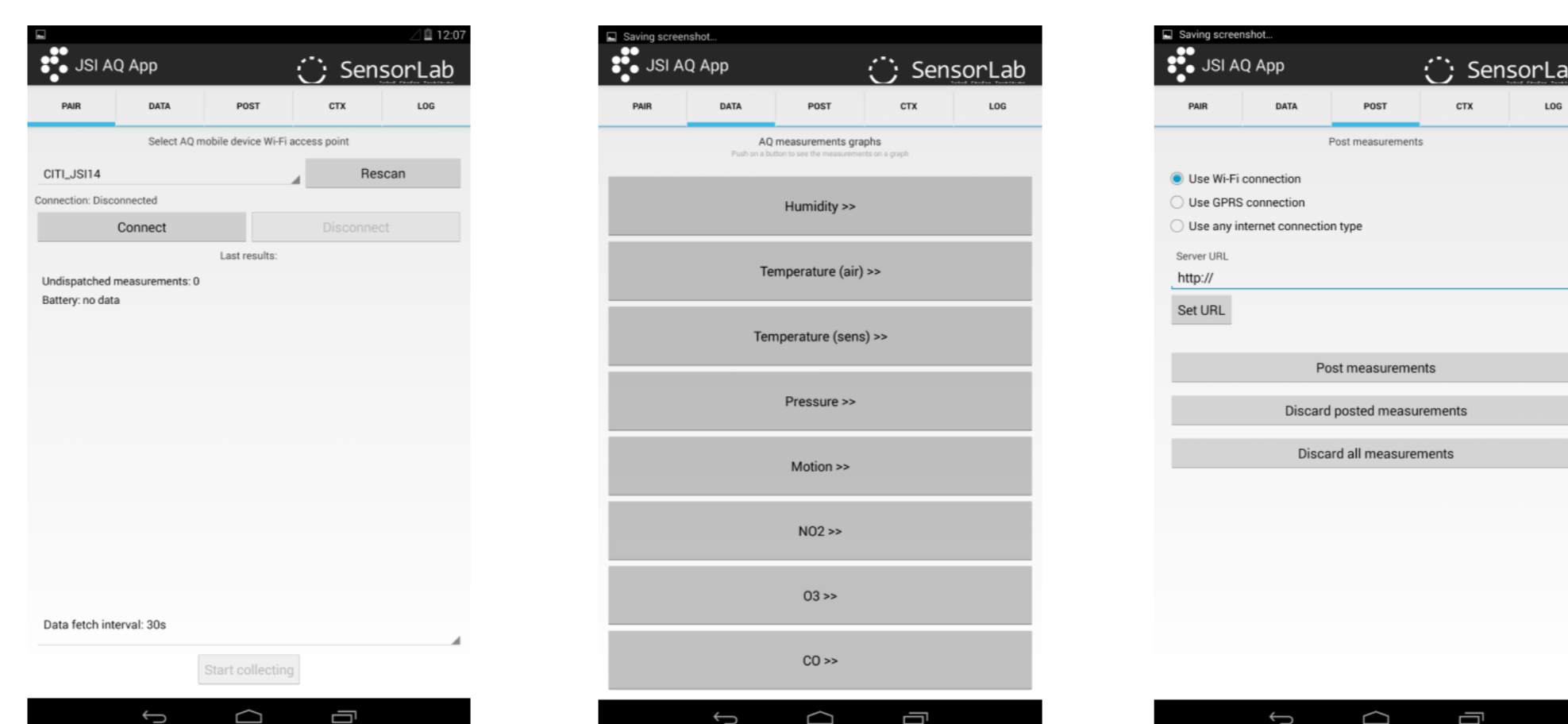
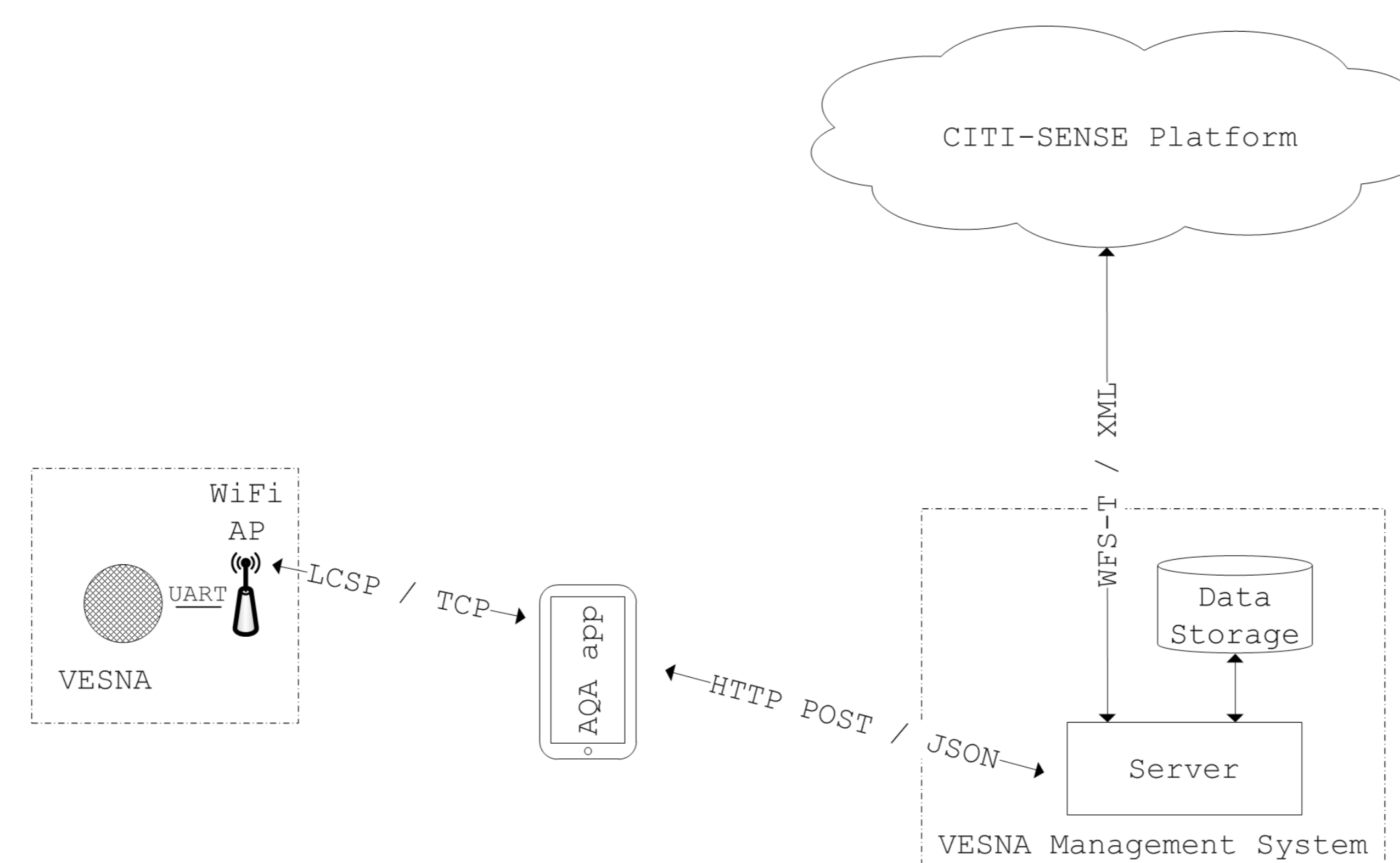
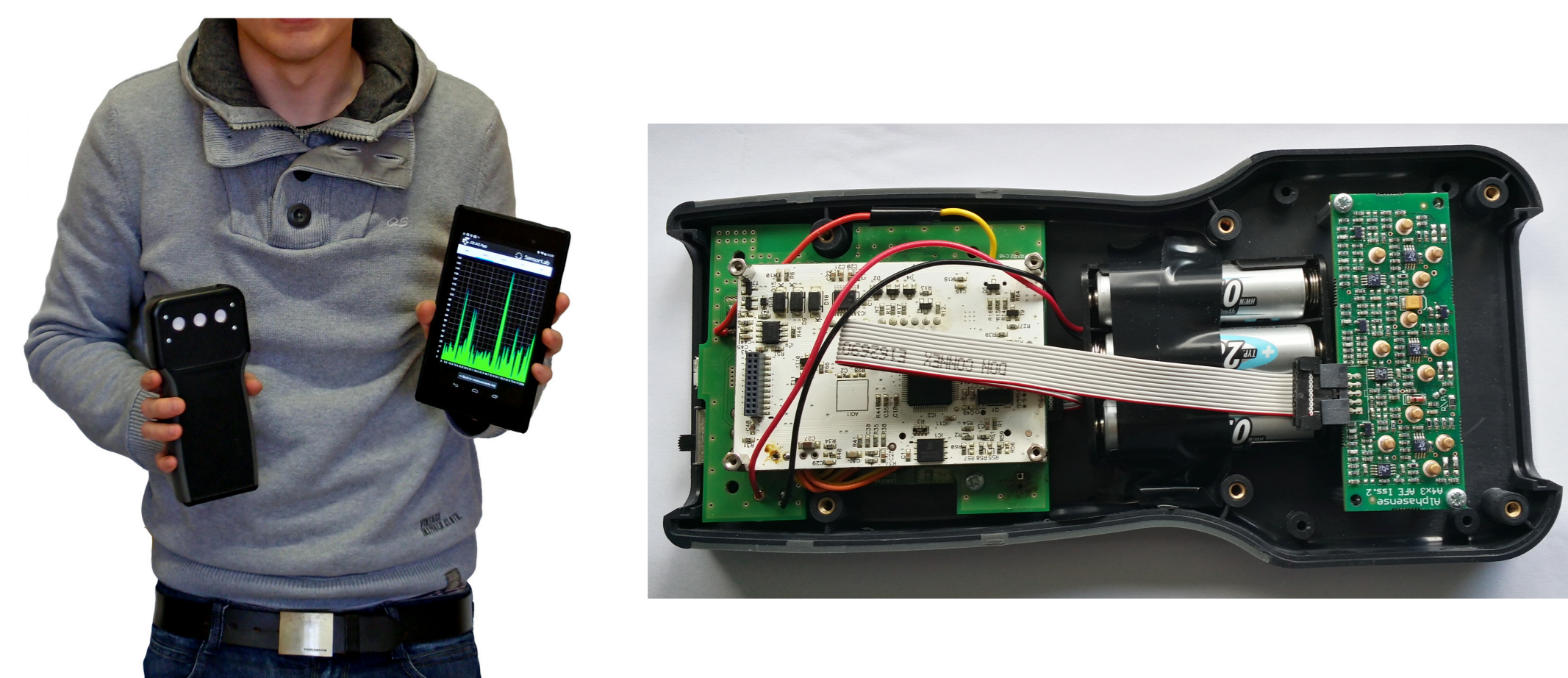
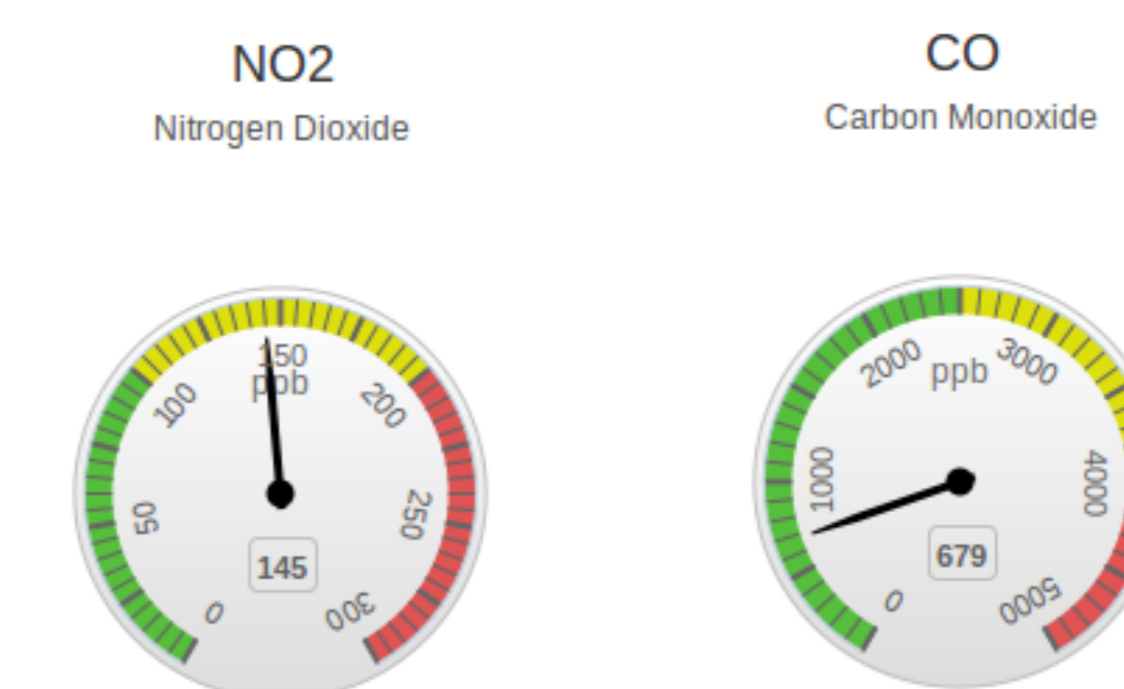
AQ app

- IJS AQ mobile app consists of 5 tabs.
- The PAIR tab is used to set up the connection with a VESNA-AQ over WiFi.
- DATA tab is used to visualize the data, which is stored locally on the smartphone.
- The POST tab is used to forward the collected measurements to the online server and:
 - choose the type of connection,
 - manage collected data.
- The CONTEXT tab is used to annotate the data and make it more meaningful.
- The LOG tab is used for monitoring the operation of the unit.

CITI-SENSE Platform API support

- WFS-T support is a combination of a PHP server script and PostgreSQL database used as a sensor register.
- The PHP code consists of four parts:
 - Data parser and translator from JSI JSON to WFS-T XML format
 - WFS-T sensor registration
 - WFS-T data insert
- In parallel to the WFS-T process the data is being stored in PostgreSQL database.
- Collected data is available through the CITI-SENSE Platform API.

Demo: <http://log-a-tec.eu/aqa.html>



Application in citizen science

The project aims through creating citizens observatories' to empower citizens to contribute to and participate in environmental governance, enabling them to support and influence community and societal priorities as well as associated decision making.



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