

REFERENCE CASE

SMART Project Alarm system that protects from oil spills

SUMMARY

Dewire in cooperation with Researchers at Mid Sweden University, MittSverige Vatten & Avlopp AB, the environment office at Sundsvall Municipality have developed a prototype for a new sensor system that can alert and track oil spills in storm drains.

The municipality have recent years worked intensively to reduce discharges to water. However, problems remain with sudden oil spills to the water grid which are difficult to detect in time.

Often, the spill reach treatment plants or waterways before it is discovered and then it already has damaged the aquatic environment.

- Today's solutions for the detection of oil pollution is complicated and time consuming. We have been working a long time to track emissions in our pipeline faster but with this solution we found the possibility of using sensors to alarm oil spills in a early stage, says Anna Stenlund at MittSverige Vatten & Avlopp.

- The sensors have to be reliable and transmit data wirelessly in real time to an IoT platform based on AWS, Amazon Web Services that alarms when a oil spill occur and presents each emission has been detected, says Per Lundgren at Dewire that develops mobile applications and IoT solutions.



Dr. Sebastian Bader is on the researchers who develops wireless sensor solutions for measuring oil in storm drains.

ABOUT SMART PROJECT

The Smart project is owned by Mid Sweden University and will continue during 3 years for research and creation of new business within IoT. The project started in 2016.

Subproject: Intelligent wastewater and water network

Parties in this subproject have been:

- Mid Sweden University
- MittSverige Vatten & Avlopp
- Environment office at Sundsvall Municipality
- Dewire

BACKGROUND

In a prestudy researchers at Mid Sweden University has tested a sensor that can detect small amounts of oil in moving water. The sensor is immersed in a stormwater drain and data from the sensor is transmitted to a system where the oil presence in the well can be monitored in real time.

For the first prototype deployed in a stormwater drain near Selångersån in Sundsvall it was needed a system solution to distribute data continuously and to presentate in a webpage and alarm handling.

OUR SOLUTION AND DELIVERY

In this project, Dewire designed and implemented both frontend and backend solution that was based on Amazon Web Services (AWS). Dewire worked in agile teams with planned sprints, carefully prioritizing the requirements in daily cooperation with the project.

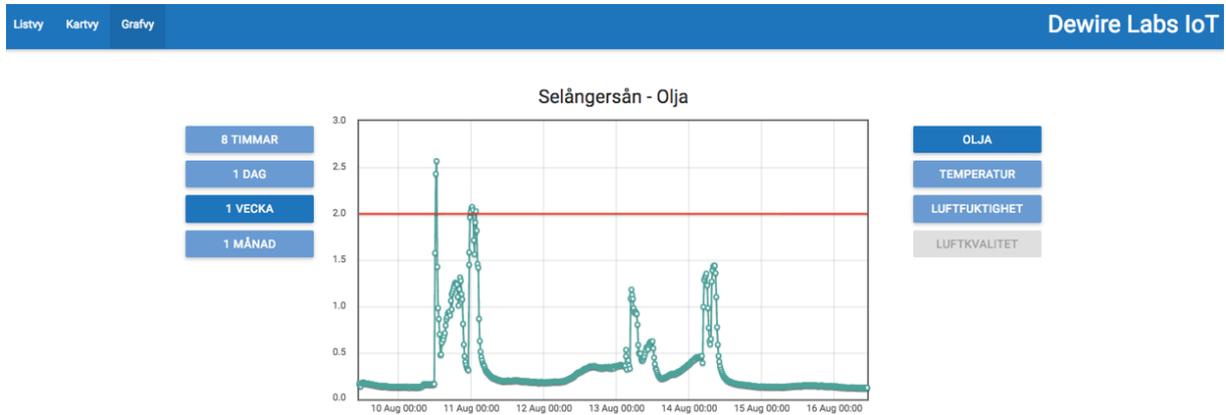
Thorough agile work methods, planning, process fine tuning, and innovative solutions guaranteed a high-quality delivery within the desired timeframe.

The project identified the following challenges during design phase:

- Cost of sensors
- Maintenance
- Battery life
- Difficult environment - dirt, etc.
- Communications network
- LoRa vs NB-IoT vs 5G
- Scalability - Solution that can grow
- Growing stocks with sensors - eg model, version, location
- Information Security - GDPR

The delivery from the Dewire was the following:

- IoT platform based on AWS with sensor integration and handling
- User Interface + Alarm Center for Central Water and Environmental Office



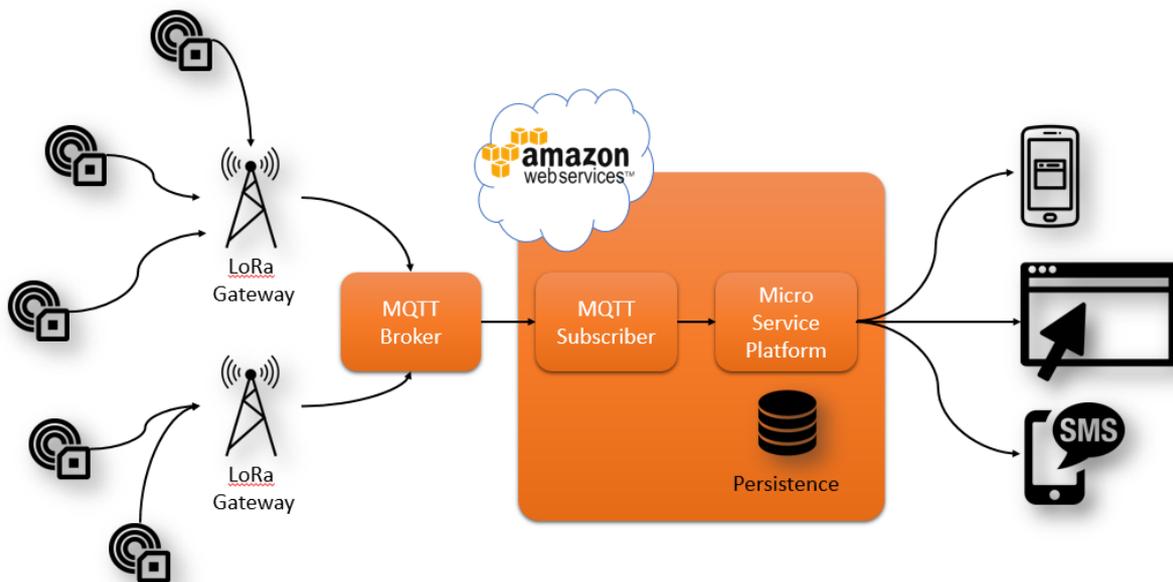
User Interface + Alarm Center for Central Water and Environmental Office

The technical bases of the project were: Amazon Web Services (AWS), Dewire IoT platform, sensors, continuous integration (CI), large-scale instant communication and security.

Scripted development environments and continuous integration allowed all team members to work autonomously in a structured way at full pace from day one.

Developers had a full-stack local environment, testers could deploy the latest code at will, and the flow of features - from planning and development to testing and deployment - was visible to customer and the project at all times.

Instant communication across thousands of geographically spread-out connected devices was achieved by drawing inspiration from the field of Internet of Things (IoT).



System solution

ROLE

Development was done using an agile team following the Scrum discipline. Support and maintenance is handled by the support-team following the ITIL discipline.

KEY SUCCESS FACTORS

- High responsiveness and continual adjustment to the research project needs and priority
 - A stable and flexible initial design with AWS
 - Using modern frameworks
 - Integrating the practice of continual documentation in the design-implementation cycle
 - Low energy consuming equipment
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