Demo Case Update

From SWW – South West Water

18 June 2020

Fiware4Water kicked off in June '19 with a general assembly of the consortium in Brussels which included partners from 14 different institutions across Europe. South West Water (SWW) were one of four demo cases ready to test the FIWARE technology. For SWW, the goal was to create a FIWARE enabled pipeline to retrieve consumption data from smart meters and provide this data to customers via a smart phone application to drive positive changes in water use behaviour, reduce consumption and reduce the customers' water bill.

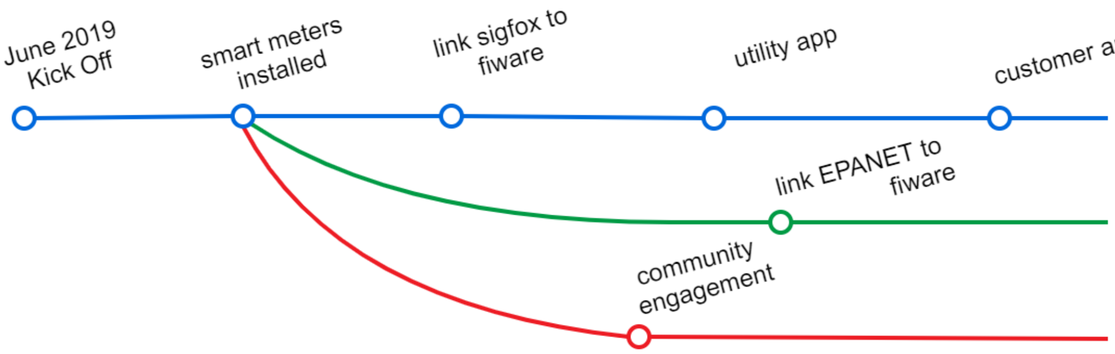

Figure 1: SWW demo case milestones

Smart water meters and masts were installed in Great Torrington, Devon in the South West of the UK to transmit daily water consumption data via Sigfox to Fiware and a SWW owned data store. By September '19, SWW were receiving daily data for around 100 customers who had signed up to the trial.

A link between **Sigfox and the FIWARE context broker** is delivering consumption data to the FIWARE ecosystem where it can be stitched together with other datasets through the use of common data models in a common data structure known as JSON-LD. Rainfall data and energy consumption could for example be used to predict water consumption and help SWW manage supply in real time. Downstream of the context broker, the data will be saved in a database for billing and trend analysis.

```
{
    "id": "entityId",
    "type": "entityType",
    "att1": {
        "value": "value1",
        "type": "Text",
        "metadata": {
            "metada1": {
                "value": "metavalue1"
            }
        }
    }
}
```

Figure 2: JSON-LD data structure

A utilities web application will provide a user-friendly interface for SWW staff to detect customer leaks, promote water efficiency practices and encourage customers to switch to a metered bill and save money. Under the hood, powerful machine learning will trigger alarms and make water consumption predictions.

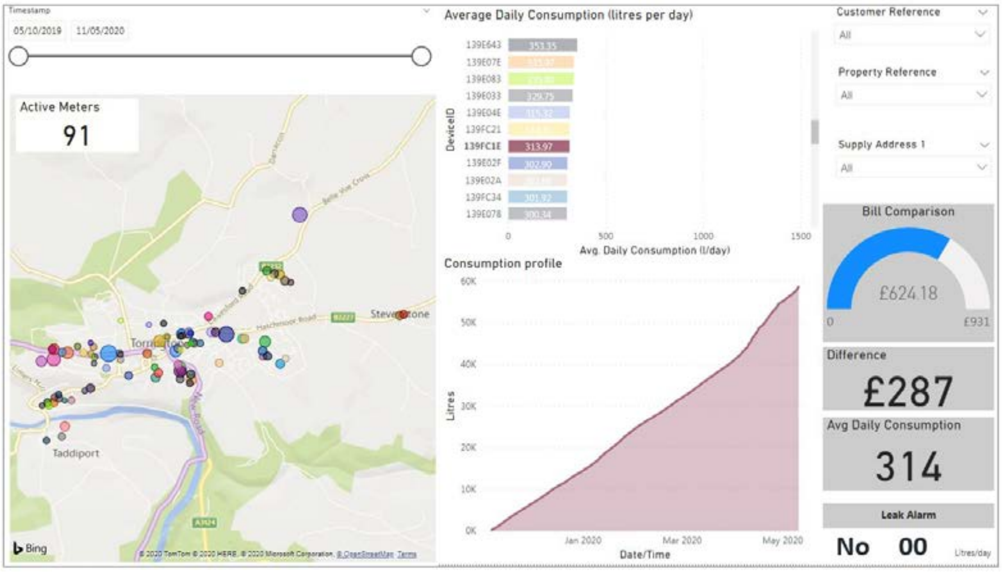

Figure 3: prototype utilities web application showing water consumption from customers

The majority of water bills across the UK are based on one or two water meter readings per year which is an adequate frequency for accurate billing, but it does not support more proactive customer engagement around consumption and leak identification. We hope that viewing daily consumption via an accessible **smart phone application** will educate and empower customers to help the environment and reduce their water bill.

Community Engagement. It is important to co-design technology with users, in this case, the community of Great Torrington. The aim is to work with the public and the council to design a platform that helps communities reduce their water usage. Findings from the study will feedback to the EU and UN World Water Quality Alliance (UNWWQA). It was planned that the engagement activities would be in-person workshops and meetings but due to Covid-19 we are designing a completely digital approach with a planned start date of September 2020.

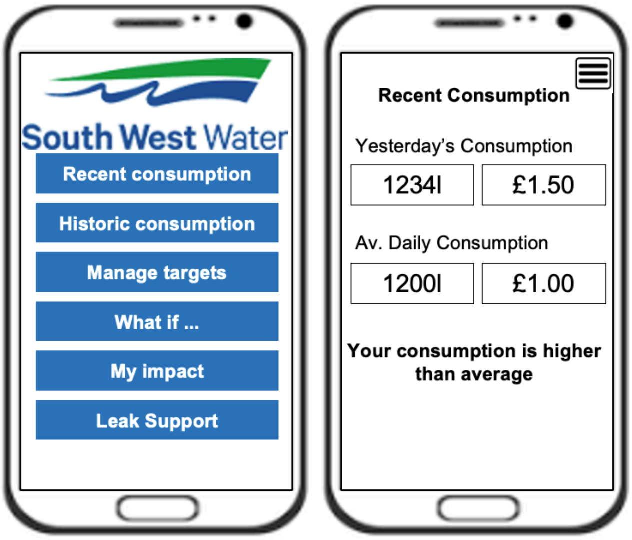

Figure 4: wireframe design of customer mobile app

Linking FIWARE to EPANET, the open source water distribution modelling software, to allow real time simulations could provide helpful insights for the management of network incidents such as bursts. To test this theory, the standard EPANET model data structure (.inp) is being converted to the FIWARE standard JSON-LD format. Data from meters or pressure sensors will be retrieved from the FIWARE context broker and used to update the model, allowing EPANET to simulate the water distribution in the network using real-time data feeds from IoT technology.

72 lines (72 sloc) | 1.78 KB


```
{
    "id": "urn:ngsi-ld:Junction:63fe7d79-0
    "type": "Junction",
    "createdAt": "2020-02-20T15:42:00Z",
    "modifiedAt": "2020-02-20T15:45:00Z",
    "location": {
        "type": "GeoProperty",
        "value": {
            "type": "Point",
            "coordinates": [
                24.30623,
                60.07966
            ]
        }
    },
    "elevation": {
        "type": "Property",
        "value": 105.8,
        "unitCode": "MTR"
```


Figure 5: EPANET model converted to the FIWARE compliant JSON-LD structure

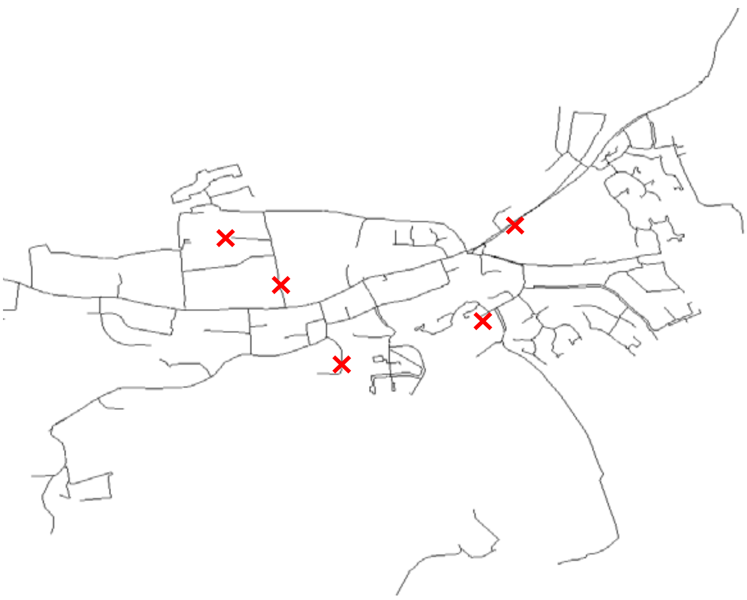

Figure 6: Schematic of hydraulic model for demo case site; Great Torrington

Author: South West Water

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Project Consortium

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