Open Source solutions for Smart Communities

By Evdoxia Kouraki, Justine Ottevaere, Kim Stannov Søvsø, Samaneh Beheshti Kashi.

CxC Festival 2022, January 12th.
Agenda

11:30 - 11:40: Intro to the SCORE approach

11:40 - 11:50: Experiences from replication of the open source QR code toolkit from Ghent to Aarhus

11:50 - 12:05: Collaboration and approaches to increased transparency on IoT devices from Hamburg

12:05 - 12:15: Learnings and reflection
What is SCORE?

By Evdoxia Kouraki, Johanneberg Science Park
and Justine Ottevaere, City of Ghent
**Smart Cities + Open data RE-use (SCORE)**

**SCORE** aims to increase efficiency and quality of public services in cities through smart and open data-driven solutions.

**SCORE partners** develop innovative solutions based on open data and focus on sharing insights and methodologies for developing better public services.

For instance in the shape of better management of sustainable mobility, improving air quality, monitoring flooding and furthering crowd management.
Replication guidelines & replicability assessment tool were developed to assist SCORE partners in this process.

Many SCORE partners testified that while the full replication scenario is the most attractive, the component scenario has the most potential to succeed!
“Experiences from replication of the open source QR code toolkit from Gent to Århus”
presented by Kim Stannov Søvsø, City of Aarhus

“Collaboration and approaches to increased transparency on IoT devices”
presented by Samaneh Beheshti Kashi, City of Hamburg
Experiences from replication of the open source QR code toolkit

By Kim Stannov Søvsø, City of Aarhus
The challenge and solution

Hard coded number -> One QR code

QR Code Toolkit: Dynamic QR codes with complete management interface

Hardcoded URL -> Many possible functions
Replication in Aarhus

One preferred QR code platform used across the entire municipality for any purpose.

A uniform "labeling" system supporting transparent technology installations throughout the city - IoT devices, cameras, robots.

QR codes as means of easy onboarding of sensors in the OS2iot platform.
Five simple steps to implement

1. Setup instance on Heroku
2. Define first test case, setup QR code
3. Create endpoint for QR code
4. Test flow end-to-end
5. Explore and scale to further use cases
Collaboration and approaches to increased transparency on IoT devices

By Samaneh Beheshti Kashi, Free and Hanseatic City of Hamburg
Overview of IoT registries

Amsterdam IoT registry

City of Ghent IoT registry

Hamburg implementation 1: IoT registry

Hamburg implementation 2: C-ITS Project Map

Video: SCORE Solutions – IoT Registry - YouTube
IoT registry in Hamburg

IoT registry ([https://geoportal-hamburg.de/iot_registry_hamburg/](https://geoportal-hamburg.de/iot_registry_hamburg/)) by using the existing master portal technology

- Service contains nearly 5,500 metadata records of sensor location
- WMS-/WFS-Service

Included sensors:

- Infrared sensors
- Sensors for photovoltaics, energy, temperature measurements
- Occupancy sensors for electric charging stations
- Sensors for the availability of bikes at rental stations
- Traffic light signals
- Sensors for the availability of bikes at rental stations
Data sources & Data models

- Export on a daily bases using real-time-data architecture: https://iot.hamburg.de/v1.1 using the OGC SensorThingsAPI https://developers.sensorup.com/docs/
- To get the data into the UDP-HH (Urban Data Platform-Hamburg) a FME process is used
- The data using the SensorThingsAPI are then stored on a FROST-Server
- This process runs once every night to write the data into our PostGIS-Database.
- The returned JSON element is further processed and transmitted to our WMS-service and configured using Deegree (https://www.deegree.org/)

WMS: https://geodienste.hamburg.de/HH_WMS_IoT_Registry
WFS: https://geodienste.hamburg.de/HH_WFS_IoT_Registry
Portal-Version (named Iot Registry Hamburg) provides different filter functions
C-ITS Services visualized

- Counting cyclists
- Environment recognition
- VRU
- Bus Prioritisation
- GLOSA

Visualizing C-ITS-services in Hamburg on an interactive map

Gathering information about different services and used technologies

Automatically update the visualization
Data sources & Data models

Agency for Geoinformation and Surveying (LGV)
Implementation as a UDP-service and UDP-Portal

Hamburg implementation 2 C-ITS Project Map
Learnings and reflection

By Evdoxia Kouraki, Johannebgerg Science Park
and Justine Ottevaere, City of Ghent
Learnings

• **Timing is key!** All the relevant stakeholders need to be involved at the right time of their own decision-making process.

• Not underestimate the time needed for discussions to understand the challenge the solution is meant to solve, thus determining what aspects of the solution are most relevant and how they are best replicated.

• The **right stakeholders** can vary from city to city considering the unique organisational structure of each municipality. For a smoother more efficient implementation they ought to have the **right mandate, time and resources required in the replication process.**

• **Establishing a fluid internal communication** between the various departments involved can take time. Not to mention that the people involved do not always have the priorities or use the same vocabulary.
Reflections

- Sharing is caring!
- Mind the balance: generic components vs local priorities.
Thank you!

More info about SCORE:

https://northsearegion.eu/score/