IoT in Smart Building Bathroom Occupancy

euristiq

Tektelic is a Canadian provider of best-in-class IoT gateway sensors and globally deployed applications.

Challenge

The client was looking for an application to integrate with its LoRaWAN™ IoT gateways and sensors to resolve a problem for one of its major customers. The customer in question has only one restroom per floor, which is not adequate to meet to floor occupant demand. This leads to employee frustration and wasted time, either waiting or finding an available restroom on other floors.

The team also faced and resolved the following challenges:

- understanding the client's device specifics in the short term
- lack of devices for testing
- time zone differences with the client

Solution

The application tracks the occupancy of each urinal station and toilet seat through the uplink payloads sent by the sensors and presents the results on a dashboard.

Also, the application displays the "vacant" or "occupied" indicator for each toilet on a floor plan. In addition, it records the statistics per restroom and visualizes it on the "popular times" histogram.

Due to efficient management, all requirements were completed by the deadline, and the workflow was organized in a way to mitigate the time difference with the client.

The bathroom occupancy application was developed in parallel with the meeting room application, which took less effort since the core code of the application was reusable in this situation.

Tools and technologies

- Java
- Spring Framework
- Hibernate
- Swagger
- HSQL DB
- Flyway DB
- Eclipse Paho
- Retrofit 2
- Microsoft Azure
- Google API Client
- Auth2
- Maven
- Guava
- Lombok
- JUnit
- Angular
- HTML
- CSS
- JavaScript
- Bootstrap
- TypeScript
- Yarn
- MQTT
- WebSocket

Scope of work

- Architecture engineering
- Decisions on the technical stack
- User interface/User experience (UI/UX) design
- Front-end/back-end development
- Quality assurance
- Technical consulting

Results

- An application integrated with the clients' LoRaWAN™ IoT gateways and sensors.