

IoT for social housing – technology and further uses

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7 March 2018



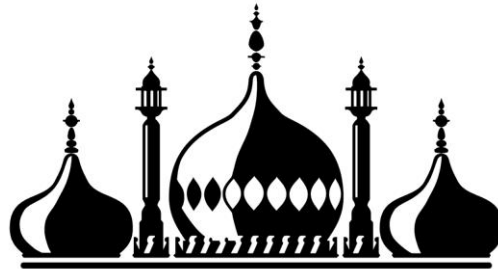
Brighton & Hove
City Council

A bit about Brighton housing

Brighton & Hove City Council (BHCC) is a unitary authority, currently under a minority Labour administration with a committee system.

BHCC has a retained housing stock of approximately 11,500 properties. There are also approximately 3,000 leaseholders.

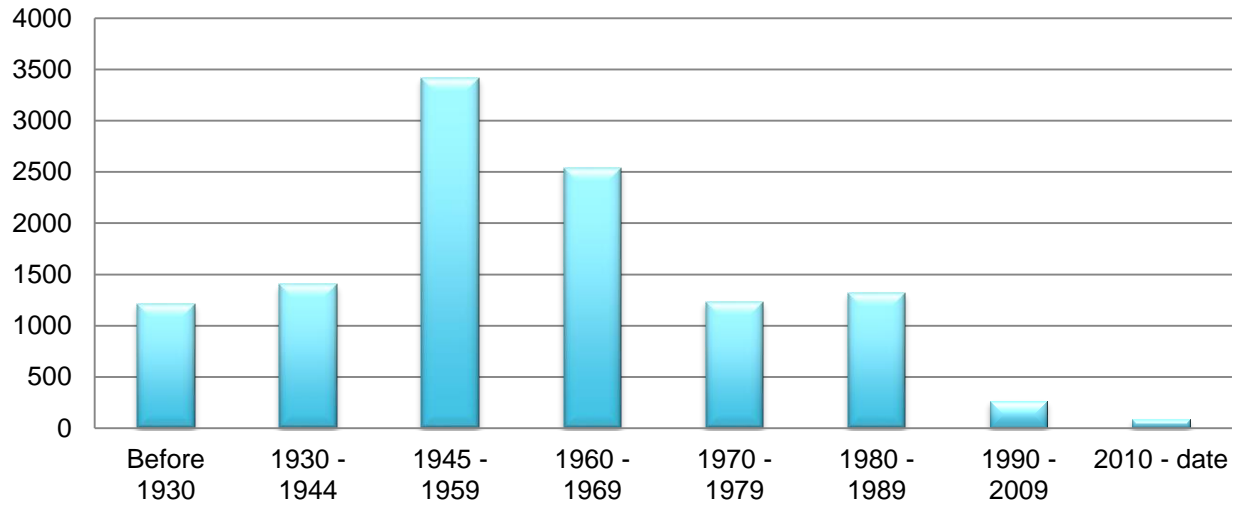
Our stock is made up of mainly houses, low, medium and high rise blocks with 1 and 2 bedroom flats.



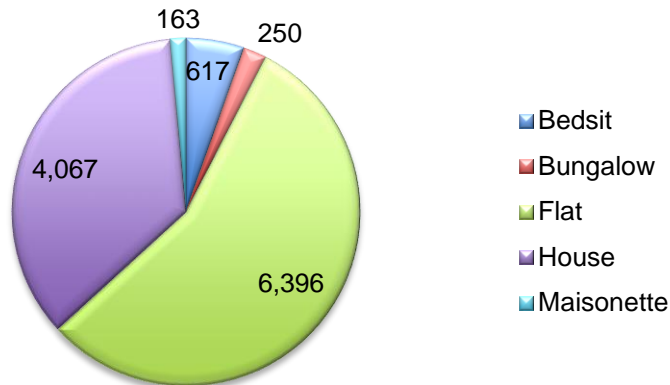
**Brighton & Hove
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A bit about Brighton housing

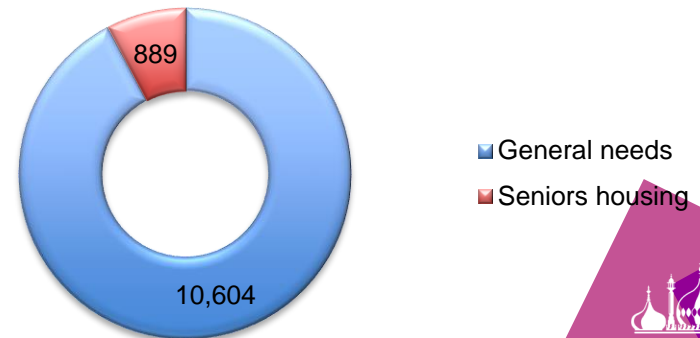
Stock by build date



Stock type



General needs and Seniors housing split



This project

The objectives for the study are:

- Test the use of sensor technology in building management.
- Collection of data measuring the effectiveness of capital investments
- Collect feedback from tenants on mobile phone app and sensor use
- Feedback from officers on quality and usefulness of data
- Increased asset data for properties



Leach Court

Leach Court is a popular seniors sheltered housing scheme built in 1975.

It has a good location in relation to Brighton city centre, the hospital, the seafront and local amenities.

There are currently 108 flats in the scheme.

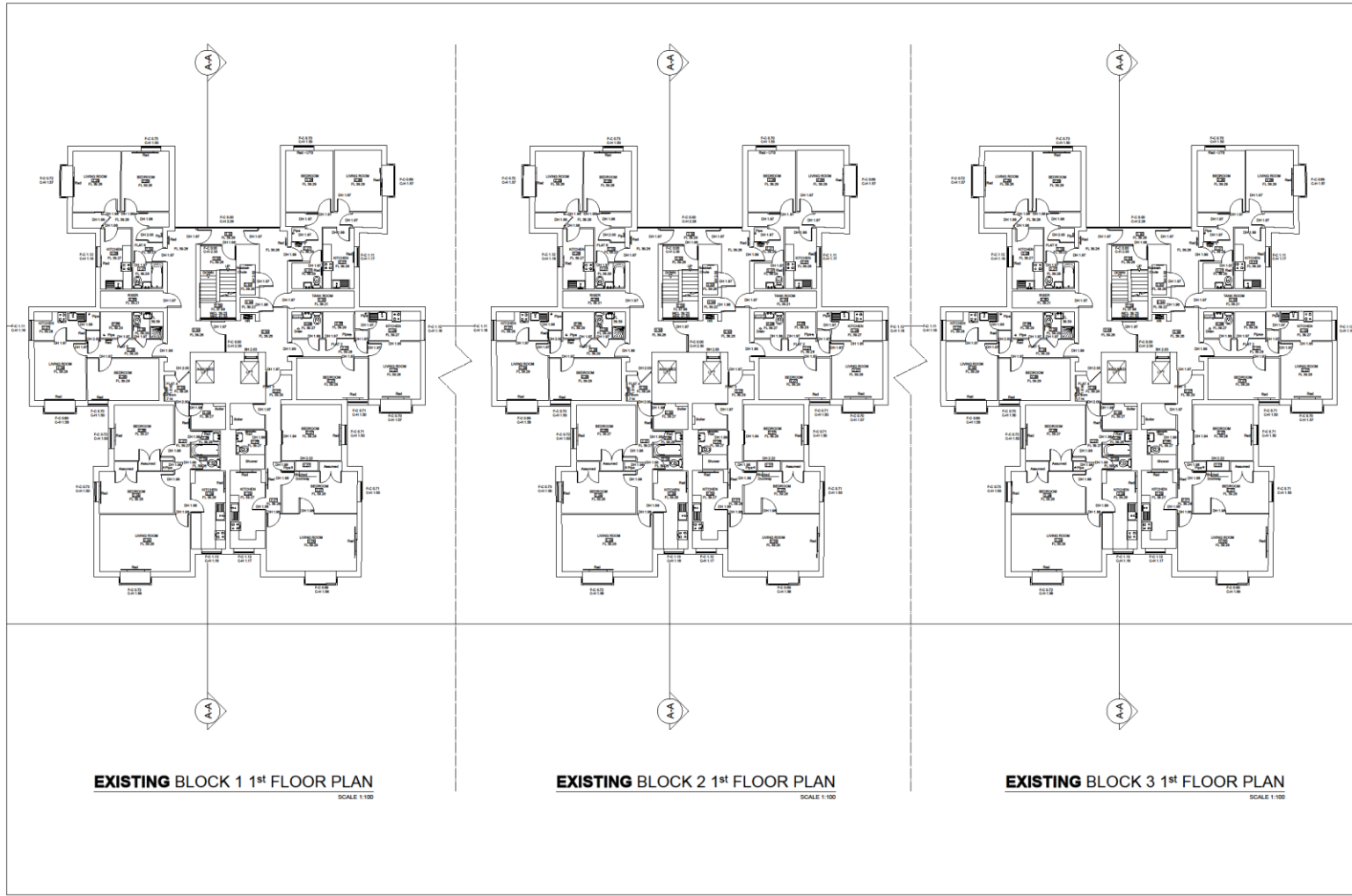
These are split into 3 blocks of 7 storey flats.

These are linked by a ground floor corridor and communal rooms.

All of the flats are served by a communal boiler system with individual thermostats in each flat.



Leach Court....

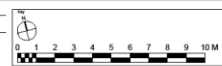


EXISTING BLOCK 1 1st FLOOR PLAN
SCALE 1:100

EXISTING BLOCK 2 1st FLOOR PLAN
SCALE 1:100

EXISTING BLOCK 3 1st FLOOR PLAN
SCALE 1:100

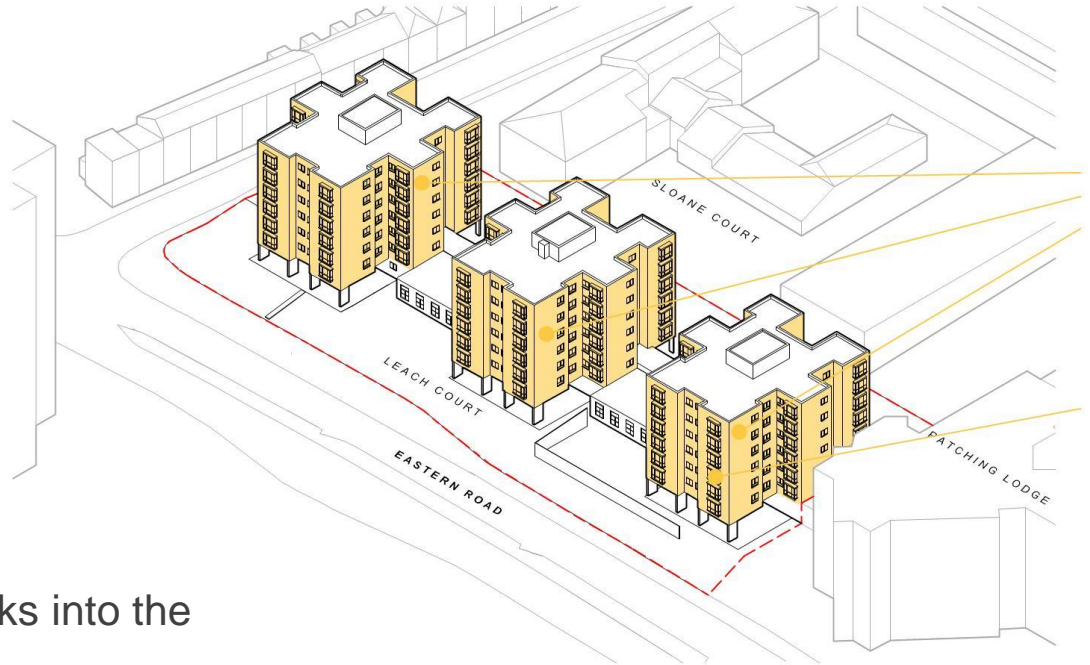
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BDM SUSTAINABLE DESIGN LTD
 LEACH COURT, BRIGHTON
 EXISTING FIRST FLOOR PLAN
 15 MAY 17 / 100441 / 100 - P.003

Refurbishment to the building



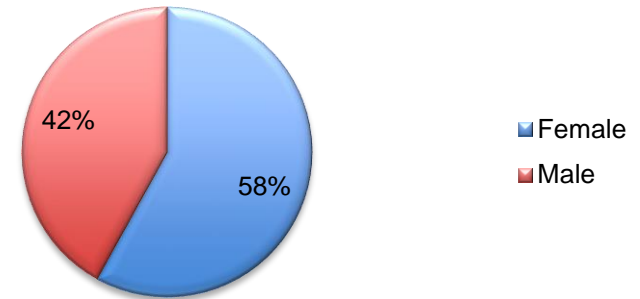
The proposed initial investment works into the buildings will involve:

- Improved insulation
- Window replacements
- Repairs to the existing concrete
- New roofing
- Improvements to the corridor and communal areas

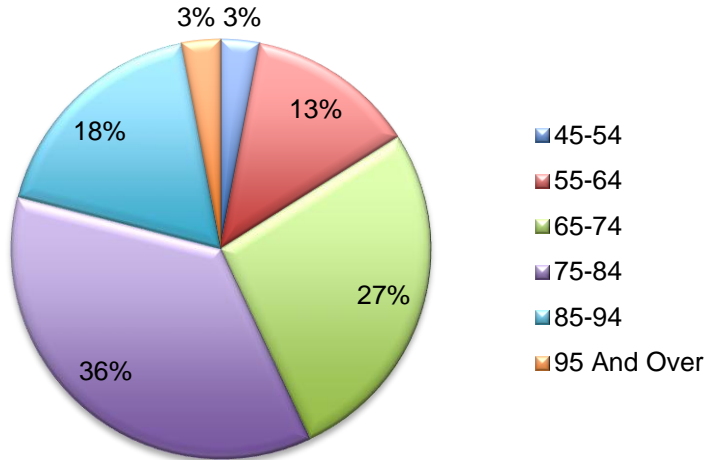


Resident Profile

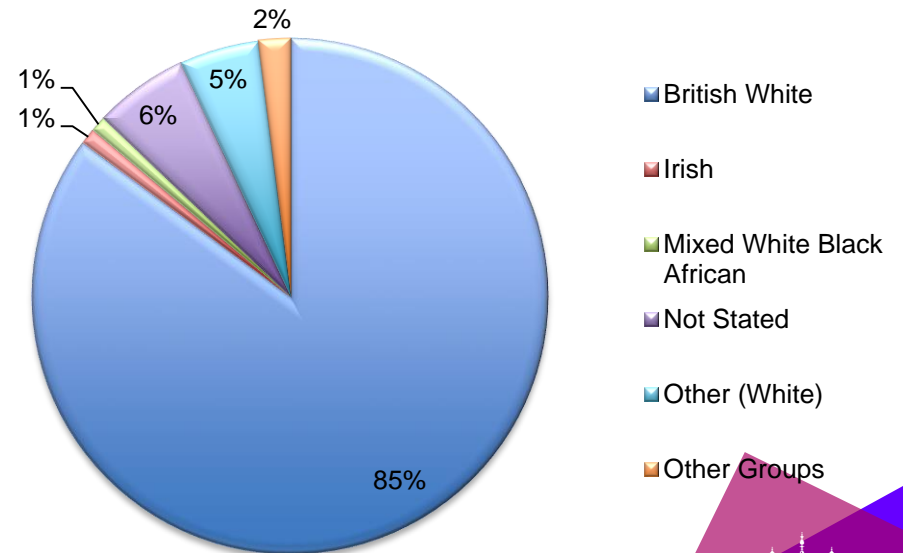
Gender Profile



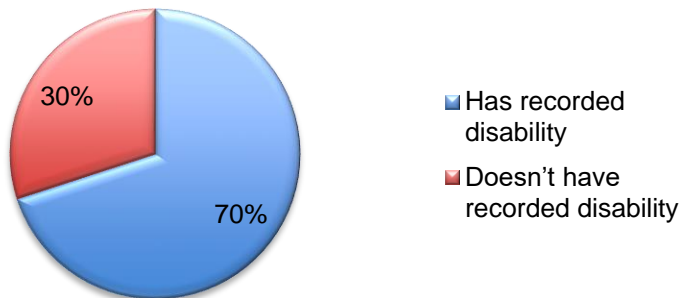
Age Profile



Ethnicity



Recorded Disability



Engagement Strategy

To engage residents into the project we wrote to them explaining the nature of the project and invited them be part of the project.

Then followed this up with a presentation to residents as part of the major works consultation.

This worked well and in total the sign up was 35 residents.



How does it benefit our residents?

The data and mobile phone app can give residents information to independently manage temperature and humidity within their homes.

Residents will also be able to see the temperature outside of their properties which will also be an advantage.

Where residents are unable to effectively maintain temperature and humidity levels within their homes the following health risks are of concern:

- Black mould is the result of high humidity over an extended period and is associated with respiratory illness and chronic fatigue
- Where a property is occupied unusually low temperatures ($< 18^{\circ}\text{C}$) over a long period can be an early warning indicator of fuel poverty
- Sustained temperatures of below 16°C are associated with increased vulnerability to infection in the over 60 age group

What will we do with the information

With the information collected we can compare the following to look at the performance of the building pre/during and post works:

- kWh of gas used per year
- Temperature (warmer/longer)
- 'Run time' of boilers (are boilers on for less time)
- Repairs monitoring
- Energy use
- Cost of heating blocks
- EPC rating
- Tenant feedback
- Behaviour change
- Communications
- External conditions (seasonal data)



What technology are we using?

- Multi-functional IoT devices developed by Synetica, installed in commonways and flats in Leach Court
- A Multitech LoRaWAN private gateway, communicating with the Synetica back-end over a VPN via 3G
- Dell Boomi iPaaS (integration platform)
- iCasewise case management system
- Mobile app developed by the Digital First programme on the Mendix RAD platform, with design guidance from The Platform Group

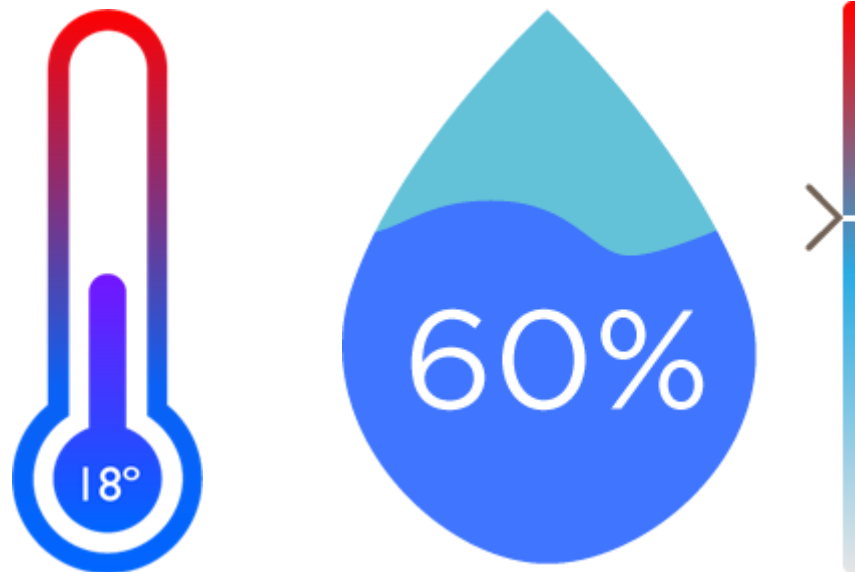
How does it work?

- The IoT devices measure temperature and humidity. Every hour, readings are transmitted to the Multitech LoRaWAN gateway
- Data is uploaded via the gateway to the Synetica back-end over a 3G VPN
- Data is then made available through the Synetica REST API



Mobile app for residents

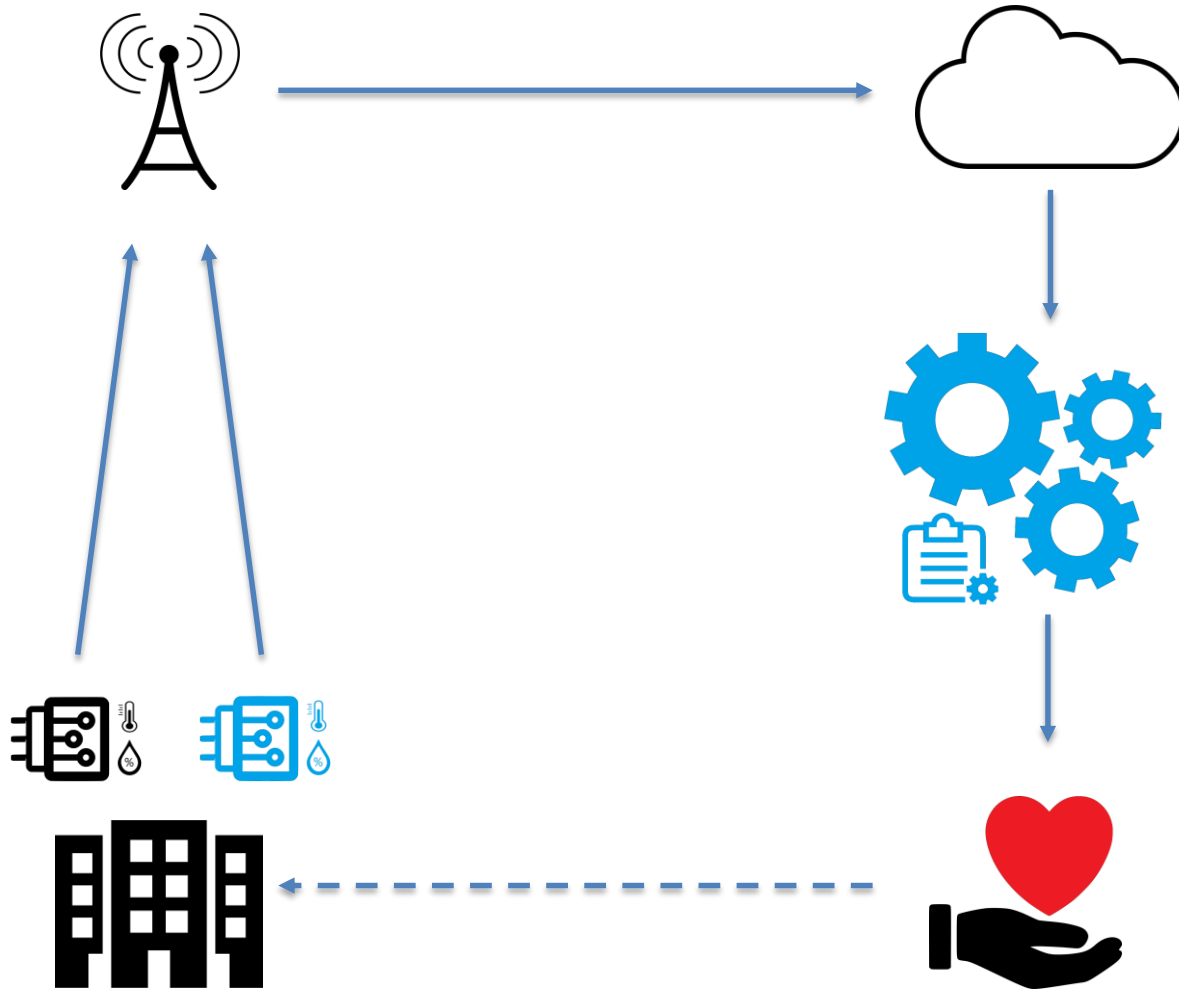
- The residents' mobile app communicates with the Synetica REST API to populate temperature and humidity information for their flat and outside.
- The app can also be used to provide notifications and advice to residents – for example, it can suggest opening a window when humidity has reached a high level for a long period.



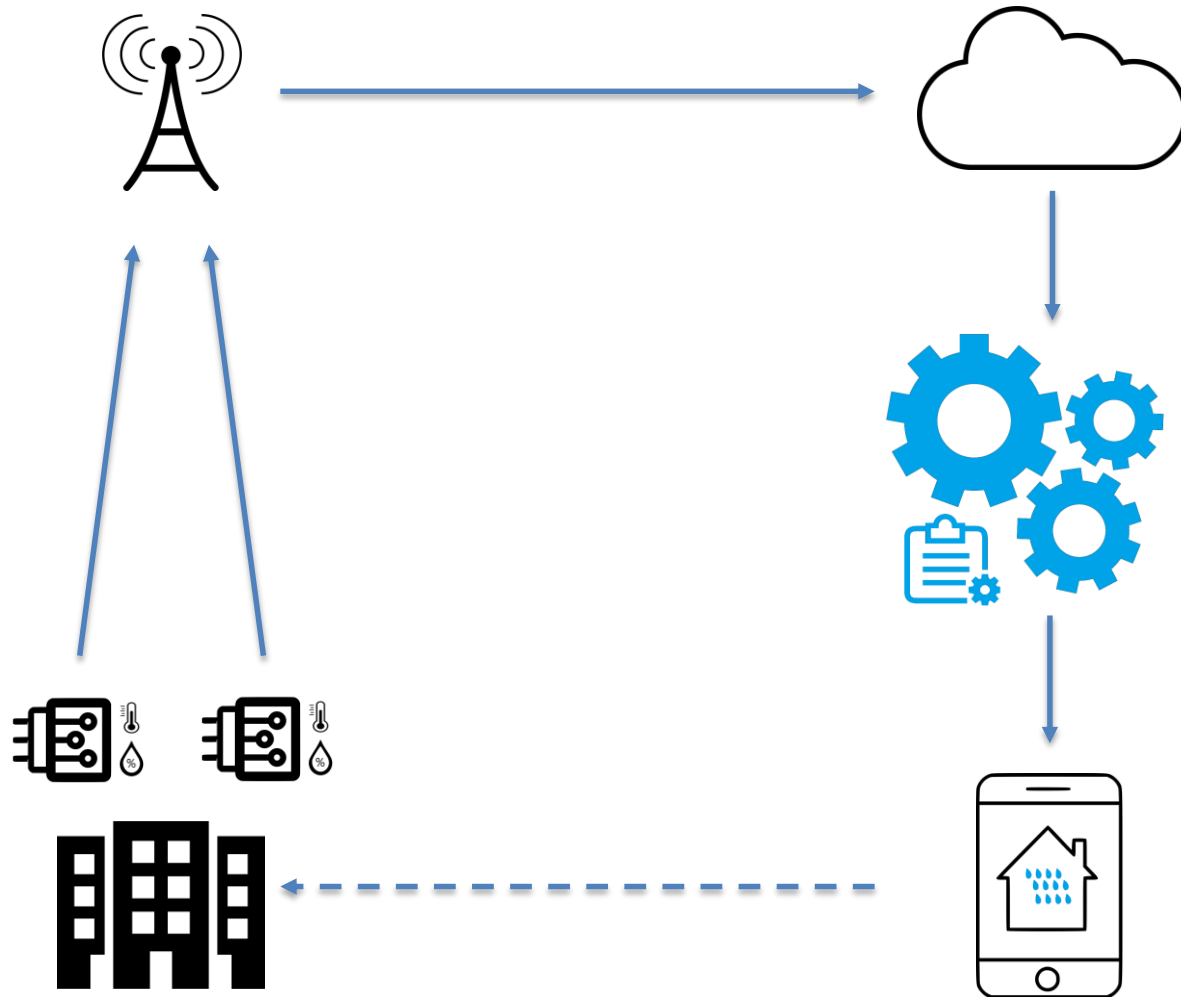
Event-driven architecture

- The integration platform (IPaaS) contains a set of business rules based on scenarios, for example:
 - Early indicators of fuel poverty (lower temperature reading in one flat)
 - Increased risk of condensation and black mould (high humidity reading over a long period)
 - Central heating issue (lower temperature reading in multiple flats)
- When one of these rules is triggered, the IPaaS populates a new task in iCASEwise via its REST API. Task creation can trigger an alert, via Skype or email depending on urgency, to the property management team or a care visitor.

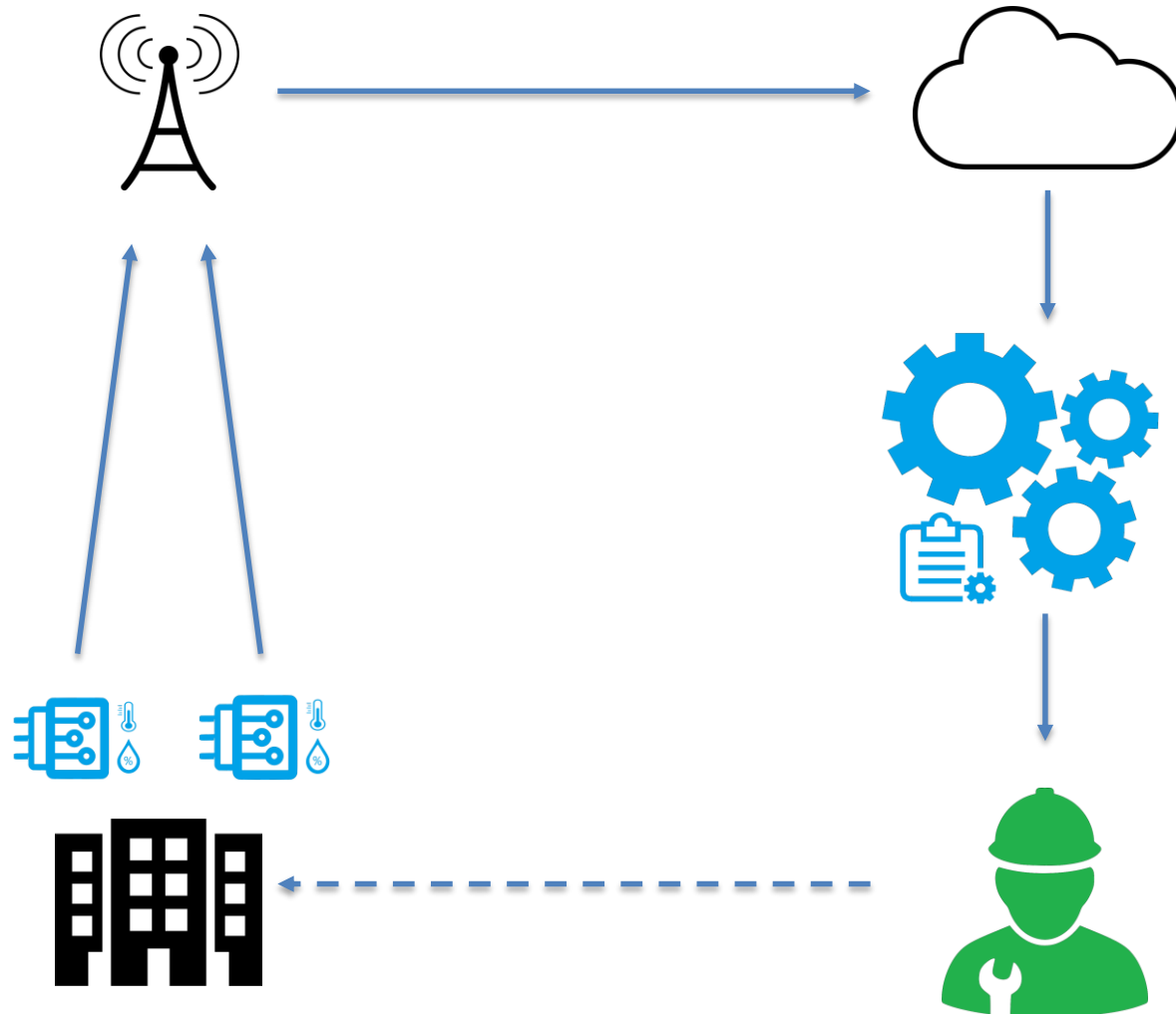
Fuel poverty – early intervention



Humidity – preventing black mould



Central heating breakdown - repair



Project partners

