



Bower House

A Digitally enabled building



Client BAM – Guinness Partnership

Location Guinness HQ - Bower House – Oldham

The challenge

The building was operating as a disparate and standalone infrastructure that was physically separated, architecturally dysfunctional and without organisational purpose. The building operation could not manage the buildings services, occupancy, associated data management and energy efficiency.

The desired outcome was to make the building Digitally ready ensuring the building is Future proof.

The Solution - Hybrid Integration

This solution provides the ability to connect disparate systems, applications, data across both On-Premises and cloud environments.

Due to the increasing adoption of cloud services whilst still relying on legacy on-premises systems, hybrid integration becomes essential for ensuring seamless communication and data flow between these different environments. Introducing IOT, AI & Machine learning is a key element to the success of these solutions.

The key to developing an Integrated Building is to understand the value of the connected data. If there is no value don't integrate the devices.

Cross-Functional Benefits

The target for the client was to create a structured data model of the systems and drive a connected outcome to provide the benefits of the cross functional connectivity.

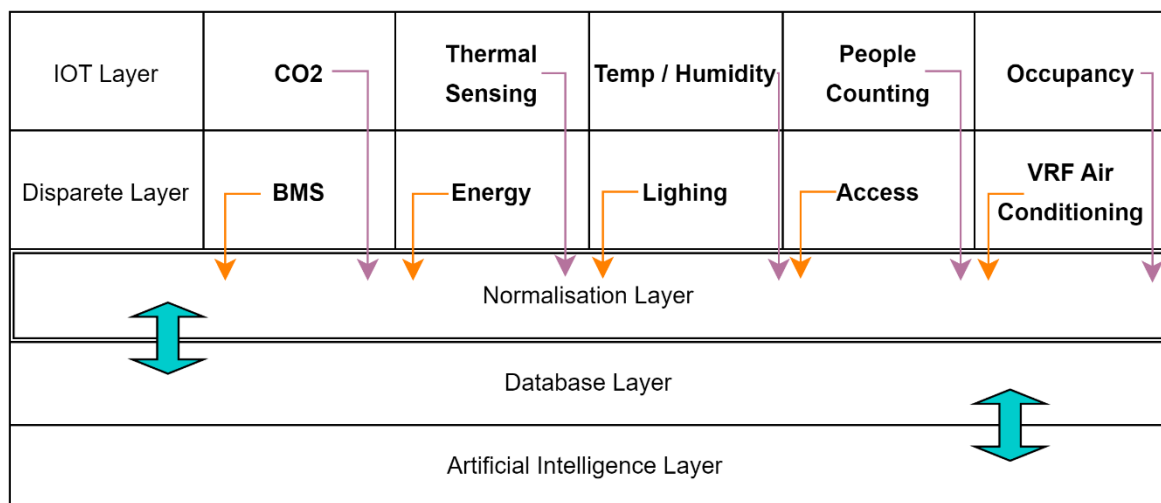
Integration of the systems and creation of real time information from each service, we enabled the ability to provide a Hybrid integration platform that could drive real value from the connected technology.

How did we do it?

The first step in developing a hybrid integration is to select the best of breed products for the deployment these must be complimentary and drive cross functional benefits across the connected systems. Integrating all the on-premises systems with the new cloud service provided data from several disparate systems and merged the data into a single source cloud.

Once this step had been completed it provided the basis for driving several benefits from the platform the connected system was made up of both old existing technologies and new IOT devices, which was created by both wired and wireless technologies that were driven into the platform as normalised data.

Integration Model used



Integration layers

Ingy Smart Sensor (IOT People Management)

Introduction of the Ingy Smart Sensor was the core driver to provide the data for people management (Counting) and occupancy which provides an understanding of the environment in real time, the sensor has multiple elements embedded that provide the IOT Data into the platform and utilises Smart thermal sensing technology from the Calumino sensing element. The system operates on the Wirepas mesh wireless technology (Self forming – self healing) providing a resilient and scalable solution which starts the future proofing of the building.

The sensor also has PIR, Lux, EnOcean and Dali features built in which can provide data from edge devices directly through the Ingy / Wirepas network.



Environmental IOT Monitoring

The next layer added was the environmental monitoring and this consisted of several sensing elements, these were deployed all around the building and onto the existing plant systems to provide enhanced data of the building performance and the plant serving the space. These again were a combination of wired and wireless technologies allowing the system to be installed onto the floor with minimum disruption to the building operation. These sensors provided the environmental feedback for Temperature, Humidity, CO2 & Particulate matter.

VRF / AC Integration

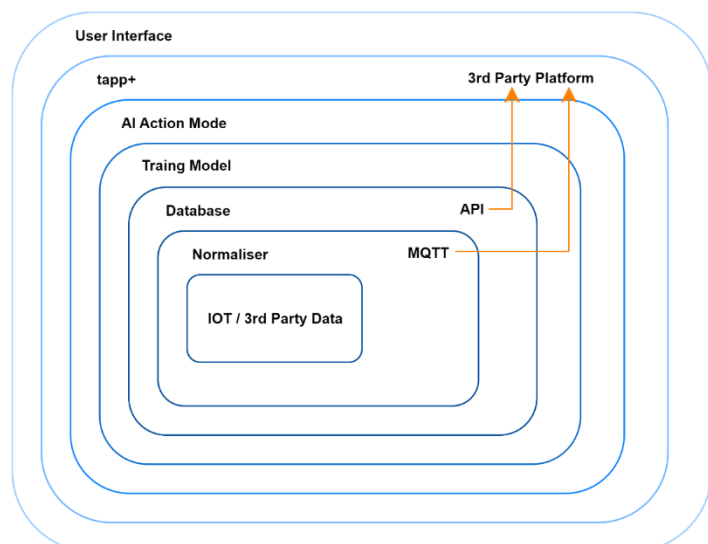
The building already has a Mitsubishi VRF system, and this served all the on-floor areas, the system infrastructure was again disparate as the BMS provides the primary air and then the system has an independent VAV system before the VRF takes up the local control within the space areas. Apart from being disparate the systems could not communicate nor understand the requirements of the space and consider the people management requirements. Control of these system were not aligned, and this was one of the major causes of the high energy usage as detailed in the summary and outcomes section.

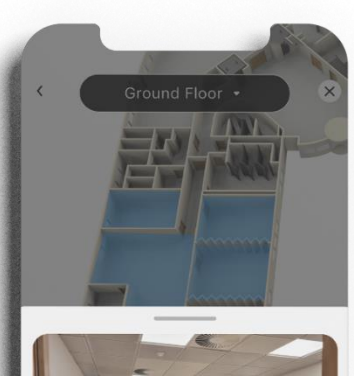
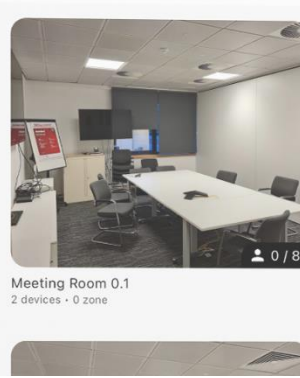
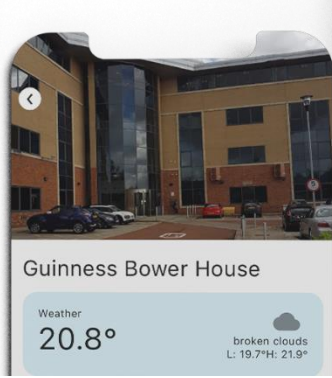
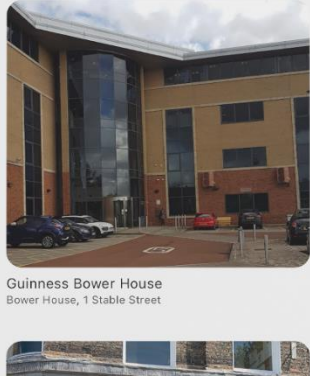
Energy Monitoring

The building had the basic energy monitoring in place and this layer has now enhanced the monitoring down to a very granular level where we can see the usage and performance of the individual plant items and then the floor-by-floor usage – Smart metering utilising both wired and wireless technology has been deployed across the building. The meters also can not only monitor the load but switch the load directly, so this increases the control ability of the building and provides enhanced scheduling.

Artificial Intelligence

The platform operates across the most advanced service available today and these are utilised in varying ways to achieve the desired outcomes the diagram shows the structure used within this project.





tapp+

After selecting the best of breed products to layer into the building and normalise the existing and IOT data, we had to provide a simple user interface for the operators. The scope of this was to allow every user type to connect to the system, but only display and manage the data that was relative to them and could be driven directly via an App rather than a desktop environment. After researching the market in this space, it became apparent that the market lacks products that integrates data seamlessly from the various systems we wanted to integrate.

Enter **tapp+**, this application can manage connectivity to more systems over the eco environment than any other product on the market today and can also provide a comprehensive permission-based function, ensuring the right data gets to the right person in real time.

The advanced integration user experience

tapp+ also has several advanced features the provide the users with unique interaction benefits to the building and all connected services. This spans across physical devices, static devices, interactive real time applications, existing on premise and cloud-based systems in a cross functional way.

Just some of the systems and benefits we have gained with this application are detailed below.



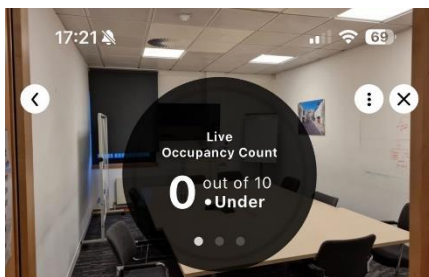
AC / VRF Integration

Provides the user with the ability to interact with their environment, whilst allowing the operator to manage the energy usage based on setpoint control and occupancy data.

Resulting in energy reductions, enhanced lifecycle and decreased service requirements

tapp+ Location Based Services

The app provides a feature rich set of services to simplify the user experience navigation around the building is via easy 3d drawings service running within the app. Assets can also be plotted on the app again filtered by permissions, so the user gets the data they need. Interaction with the data can be managed within this service plotting the real time information over the 3d map.



Short Wing

Devices



GF Short Wing Open Plan - AC
Air Conditioning



Short Wing - CO2
CO2 Sensor



40% energy reduction



ROI in 8 months



£60K annual energy savings

tapp+ Edge Integration

The foundation of the tapp+ application pivots around the ability to interact with edge devices and then provide all associated data from the edge point to the cloud and all data in-between.

This is a powerful service that allows the integration of old and new systems with the display of integrated data from all aspects of the connected systems. tapp+ onto a asset will connect to system's associated to that device, for instance tapp onto a BMS Sensor that is located within a space / meeting room will provide all the data associated with that space and device. In this instance the data displayed is streaming from 4 different services.

- BMS (Distech / Tridium)
- VRF / Air Conditioning (Mitsubishi)
- IOT Sensors (CO2)
- Occupancy / People Counting (Ingy)
- Lighting (Dali)

Asset Management

This application can also interact with static devices by using the Smart NFC Connectivity tags. These are embedded within each asset making it a unique device connecting to the network. This can also provide data about the asset that will assist the engineering team such as Data sheets, maintenance routines and installation / commissioning information.

The engineer can also request a automated service at this point that will then put the asset into service mode and run this through the paces, outputting insights and a report once complete. This ensures that the service requirements are met, proven and in line with SFG 20 and the manufacturers requirements.