ZURICH
Resilience Solutions

Zurich insite

Overview

insite from Zurich Resilience Solutions builds on our best-in-class risk engineering technical expertise to provide an innovative tool that listens to the data your building creates and provides insight to improve performance and efficiency.

Transforming data into knowledge and action is a major challenge for facilities managers and risk managers. This makes it difficult to manage risk, improve business resilience, keep people safe, and to be sustainable.

In 2016 a four-year UK Government funded study called *Building Performance Evaluation*[1], looked at building performance in over 50 buildings. It found real carbon emissions were higher than expected – compared to during design – in almost all buildings. Some emitted up to 10 times more carbon than the building evaluation report.

Most of this energy wastage and unnecessary carbon emissions are the result of issues with heating, ventilation & air conditioning, or historical settings in the building management system.

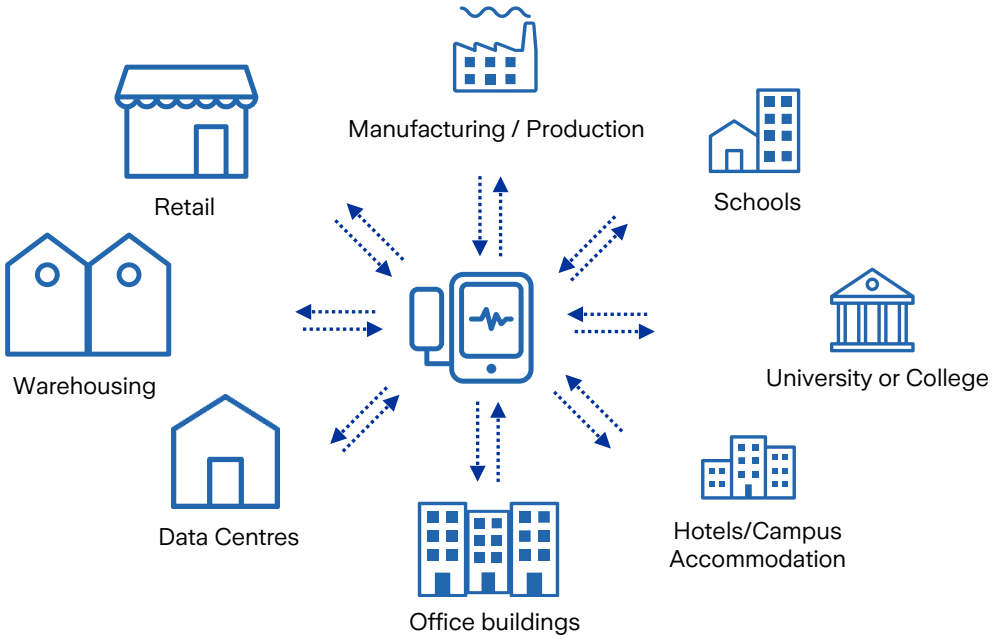
The insite device is simple to install and can be used with other monitoring devices to track boiler activity, pump activity, temperature pressure, heating systems, ventilation, cooling systems, frost protection, power metering, presence detection and fire suppression. Other sensors can also be used to add more data points and intelligence. This rich data feeds a dashboard to provide actionable insight that can be used to reduce costs, become sustainable and manage risks proactively.

[1] https://www.ukri.org/wp-content/uploads/2021/12/IUK-061221-NonDomesticBuildingPerformanceFullReport2016.pdf

Observer Device

The Zurich insite observer device gives facilities managers, operations teams and risk managers an opportunity to gather rich, clear data on building performance. This insight can be used to understand issues with buildings before they would normally be detected. It can improve building management, increase operational efficiencies, reduce risk, & optimises energy use to support carbon reduction.

The observer device can be used in a variety of building types.



Customer Benefits

Meet carbon reduction targets and create sustainable buildings by reducing unnecessary energy use

Reduce costs by identifying unnecessary use of building equipment and energy

Support **proactive preventative maintenance** by using data to identify critical building systems that are not working optimally

Proactively **manage or avoid risk** by identifying possible failures in building systems before they happen

Case Study 1 – Zurich Office in UK

Background

Working with Zurich and the facility manager for selected Zurich buildings in the UK, the project focus is risk monitoring & operational improvements at commercial office spaces. This includes both shared occupancy, city centre locations and an out-of-town campus.

A single observer device collects 6000 – 26,000 data points from the existing building management system. This is augmented with a matrix of additional sensors monitoring mechanical and electrical components not connected to the central building management system.

In total over 50,000 data points per hour are collected and transmitted in real time to cloud storage via 4G. The data includes measures of heating, ventilation, air conditioning, pumps, boilers, temperature, flow, internal and external physical temperature, humidity, occupancy and lighting, emergency valves, fire protection and fire detection.

Insights Generated

- Data gathered over a 6 week period from an air handling unit in a communications room shows performance is reducing, causing a gradual build-up of humidity. This is compounded by a blockage in a condensate pump. If undetected the communications room would have had an escape of water issue, leading to serious computer processing and network outages
- The cooling and heating systems are working against each other creating energy inefficiency and undue mechanical system stress
- Data analysed over 6 month period before and during pandemic lockdown indicate energy is wasted as heating is activated at 5:30am and switched off at 6pm when the building is unoccupied
- At pre-Covid occupancy heating activation can be brought forward to 7am and shut off at 4pm in Spring and Autumn as the building is sufficiently warmed by then

Customer Outcomes

Avoided an estimated loss of over £100,000 plus business interruption by detecting the issue with the communications room air handling unit

The energy saving in one location from changing heating activation times are estimated at **10-15% or £5-7.5k annually** per building

Further potential savings to be identified with additional sensors and smart meters across the Zurich portfolio

Case Study 2 – Bakery

Background

A pilot and rollout of the technology for a baker with over 30 sites across Europe. These large-scale bakeries have raw material storage, ovens, refrigeration, offices, and product storage. A single observer device collects 6000 data points from the existing building management system. This is augmented with a matrix of additional sensors monitoring high-risk components not connected to the system.

In total over 24,000 data points per hour are collected and transmitted in real time to cloud storage via 4G. The data includes measures of heating, ventilation, air conditioning, pumps, ovens, boilers, temperature, flow, internal and external physical temperature, humidity, occupancy and lighting, emergency valves, and fire protection.

Insights Generated

- A gradual build up of humidity levels identified in a specific air handling unit. The issue was not physically visible and would not have been identified until after the failure occurred, causing a major escape of water incident, damaged air handling unit and major repair required to the workspace
- The cooling and heating systems are consistently working against each other creating energy inefficiency and unnecessary mechanical system stress
- The building management system's configuration is causing some systems, such as heating, ventilation, and air conditioning to be running during shutdown periods when there is no demand for operation
- Data from electrical substations indicate high power consumption during shutdown periods – quantified savings based on reduced energy usage by changing operating times in the building

Customer Outcomes

Data monitored over a 3 month period helps **avoid an estimated direct single loss of €160k plus business interruption claim for loss of revenue and production time** by detecting the buildup of humidity in roof top units that could cause an escape of water into the main building

Energy savings estimated at 5% or €60k annually, by stopping operating cooling and heating systems at the same time, and outside of operational hours

Extended the lifecycle of the air handling unit, saving capital outlay. The repairs also prevent ongoing water damage. Ongoing monitoring of heating, ventilation, and air conditioning extends equipment predicted lifespan by making repairs when equipment performance drops

Case Study 3 – Facilities Management in Schools

Background

A portfolio of schools managed under an outsourced Facility Management contract. Each school is 2,000 square meters on average, with classrooms and common areas on 2 floors. A single observer device collects 84 distinct data points from the existing building management system and transmits data in real time via a cellular connection. This is augmented with 72 sensors connected via secure wireless to fill data gaps. 9,200 data points per hour are captured. The data includes measures of heating, ventilation, air conditioning, pumps, boilers, temperature, flow, internal and external physical temperature, UV, humidity, occupancy and lighting, emergency valves, and the Fire Alarm.

Insights Generated

- Mechanical systems are running inefficiently because of previously unknown off-hours operation
- Reduced domestic hot water operating temperature from 90 degrees to 70 degrees, potentially avoiding claims for personal injury
- Real time access via user interface provides data to support improved ongoing risk management and business operations

Customer Outcomes

Energy use reduced by 25% in the 1st year of monitoring after reconfiguration of the building management system by reducing boiler generated domestic hot water to 70 degrees and shortening operating times

Improved student learning environment by optimising room comfort for those using the buildings

Facilities manager can demonstrate contract assurance because the data shows key performance indicators are met. This increases customer satisfaction and reduces the potential for penalty payments

Case Study 4 – Conference Facility

Background

A facility with training, conference and meeting rooms located across ~3,000 square meters over 5 floors has a noise issue of unknown origin that was negatively impacting business. A single observer device collects 175 data points from existing building management system transmitting data via wired broadband. 10,500 relevant data points per hour are captured. The data includes measures of heating, ventilation, air conditioning, temperature, physical internal and external temperature, ultraviolet, humidity, occupancy, CO_2, air quality, emergency valves, and the fire alarm control panel.

Insights Generated

- Identified the noise issue is caused by temperature changes in the room switching the mode of operation. Maintaining a constant temperature eliminates the problem
- Lack of central control and management of the facility was creating ineffective use of energy

Customer Outcomes

Energy use is reduced by 15% in the 1st year of monitoring, **saving £80,000 per annum,** by aligning the times when heating, ventilation and air conditioning is used with when space is being used

Improved customer satisfaction by fixing the noise issue to avoid potential complaints or refunds – reducing refunds for meeting room facilities by 90% in 2021

Recommendations are made to optimise systems of operation in the long-term – further project to deliver improved cost reduction and client experience for 2022

References

1. Innovate UK Building Performance Evaluation Report: Findings from Non-Domestic Projects, January 2016
https://www.ukri.org/wp-content/uploads/2021/12/IUK-061221-NonDomesticBuildingPerformanceFullReport2016.pdf

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