

Spica

Closer. Together.

IOT: Digital Disruption in Facilities Management

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Background

“The Internet of Things (IoT) is transforming facilities management. It’s a digital revolution facilitating some of the industry’s hottest trends.” British Institute of FM

Facilities Management Executives face ever-growing pressure to improve the efficiency of their estates: Improving reliability and efficiency, ensuring operational continuity, managing the increasing complexity of buildings, merging legacy buildings and their systems with facilities expansions, maintaining aging infrastructure, and improving reporting and compliance are prime examples, along with the familiar challenge of “doing more with less.” Accessing useful evidence-based data to make informed decisions has typically been very difficult, being either based on inaccurate manual readings, or patchy point-in-time information from traditional BMS systems. The Internet of Things (IOT) offers alternative mechanisms for success, using simple, low-cost sensor devices to provide valuable contextualised data in real-time. This is a key enabler in providing Smart, Resilient Sustainable and Productive buildings.

IOT overview

The IOT paradigm shift is much more than the latest marketing trend in IT – but only if you can truly visualise and address the Edge to Enterprise picture, and provide the right context to make sense of sensor data. In turn, those companies that get enterprise IOT solutions to market early, will have the ability to re-shape their business models, with huge competitive advantage.

There are many disparate views on what the IoT actually encompasses, but two of the clearest definitions are shown below:

“The interconnection via the Internet of computing devices embedded in everyday objects, enabling them to send and receive data”

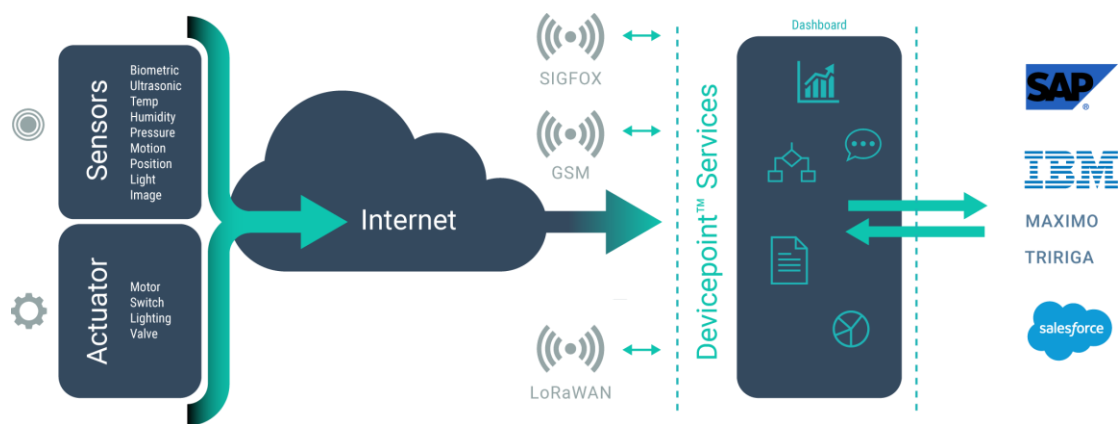
“The global network of physical objects embedded with electronics, software and sensors; and the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction”

Accenture estimates that the Industrial Internet of Things alone could add trillions of dollars to the global economy by 2020, by accelerating innovation and reinvention of sectors that account for almost two-thirds of world output

Fundamentally, IOT is a technology strategy (and technology) that should be focused on helping clients deliver real business outcomes. Too often, IoT is approached from a developer-centric (or worse still, hobbyist) viewpoint; whereas real value can only truly be derived by including business leaders in the discussions: they are interested in understanding how IOT can transform their business by:

- Managing: How can IOT help me manage my assets more effectively, become more operationally efficient, reduce my costs, and/or increase my throughput?
- Monetizing: How can IOT help me generate additional revenues from the assets that are already in my business, or help me uncover new product opportunities?
- Extending: How can IOT help me transform my business into a services business – one where I can develop meaningful product-oriented and customer-oriented relationships, increase my customers’ loyalty, and generate additional service-related revenues?

To deliver these outcomes, we need a “whole product” philosophy. It is not enough to just provide the hardware, or the network connectivity, or even the (albeit interesting) capability to connect a device and view its raw data. The organisations that can deliver all of the pieces of the IOT puzzle to their clients, will be most successful.



The precursor to IOT is Machine to Machine (M2M), which has a long history within the FM sector. Historically, M2M applications have been stovepipe in nature – with little regard for integration to other applications/data sources; and very device-centric. The industry has reached a tipping point now, where this typical silo’d approach is no longer fit for purpose. A new more sophisticated form of supporting platform is required – IOT Application Platform (IAP) is M2M recast for Age of the IOT. IAP Provides the glue to intermedate between application developers, connected devices and the wide range of niche/specialised legacy M2M platforms and wider enterprise IT systems. SPICA’s unique offering for IAP is the devicepoint™ framework.

Intelligent Buildings:

The majority of both Soft and Hard FM contracts are typically underpinned by the delivery of manually intensive, low margin tasks, with little scope for competitive differentiation in what is an increasingly crowded marketplace. Automation via BMS systems helps improve the picture somewhat, but tend to be very expensive, bespoke/difficult to integrate, traditionally only monitor core systems (HVAC/Lighting/Metering), and offer in-flight control rather than long-term analysis. The provision of low cost, retrofit IOT solutions can provide huge improvements around building efficiency, customer service and contract yield; ultimately helping increase contract retention and winning new customers.

SPICA provide a range of sensor devices (e.g. temperature, humidity, noise, presence, CO2, energy usage) and a private cloud instance of the devicepoint™ platform, configured for each specific use case. The sensors take data readings and send over (4G/SIGFOX) network into the devicepoint™ cloud platform; which in turn provides a presentation, analytics and reporting layer for the client to access via a browser/mobile device. Integration into other enterprise applications such as CAFM/BMS/Room booking systems is also available – for example, to automatically trigger a cleaning work schedule based on room usage. Data is stored indefinitely within devicepoint™. The client can also have access to additional mobile phone applications, e.g. for employees to access additional services such as desk availability. The dashboard could also be displayed in the buildings lobby.

Key Benefits

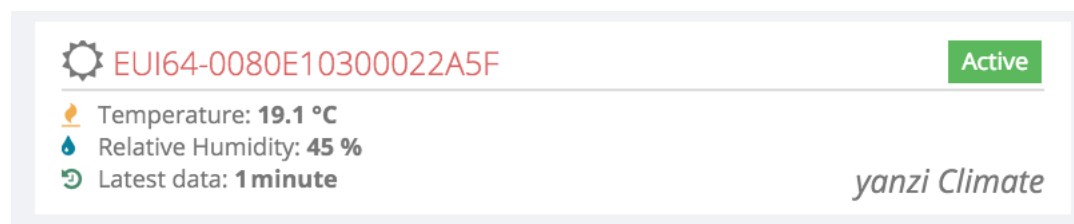
- More effective asset management
- Operational efficiencies from better building usage
- Environmental efficiencies including less consumption of energy
- Procurement efficiencies ultimately leading to greater return on investment.
- Compliance adherence – fully auditable evidence-based data sets
- Improved customer opinion through instant rectification
- Providing a bespoke service to clients based on actual building usage not planned preventative measures
- Collecting data for Business Improvement projects that can guide estimating for future bids
- Demonstrate innovation and thought leadership to clients

Example Use Cases

Below are a number of sample use cases that SPICA can provide as part of our devicepoint™ for Facilities Management solutions:

Soft FM:

Meeting Room Monitoring

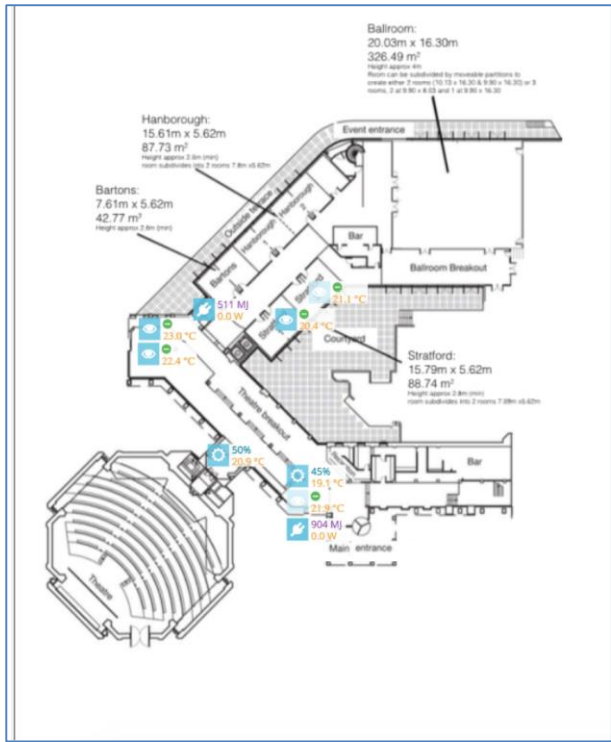


The screenshot shows a monitoring dashboard for a meeting room. At the top left is a gear icon followed by the device ID 'EUI64-0080E10300022A5F'. To the right is a green 'Active' status button. Below this, three data points are listed: 'Temperature: 19.1 °C' with a flame icon, 'Relative Humidity: 45 %' with a water drop icon, and 'Latest data: 1 minute' with a refresh icon. The 'yanzi Climate' logo is in the bottom right corner.

There is widespread acknowledgment within FM that meeting room space is not efficiently utilised, and so the collection of accurate data around current usage levels can be used to drive changes in behaviour to correct this. Motion sensors installed in a meeting room can track when the room is in use and if additionally, a sensor is placed under each desk space then the number of participants in each meeting can be estimated. Additional sensors can be used to take data readings on room temperature, humidity, noise, CO2 levels and power usage to build up a comprehensive picture of utilization and energy efficiency, as well as user wellbeing. We can also cross-reference and/or integrate this data with that provided by a BMS system(s) to compare accuracy, and act as a feedback loop to optimise building controls such as HVAC systems.

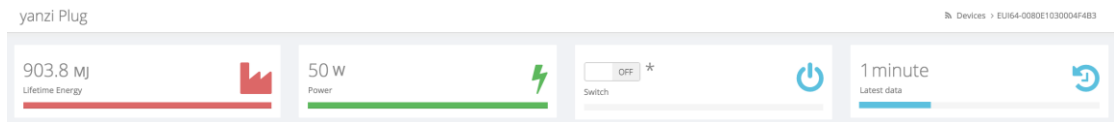
This sensor data can be correlated with a room booking information to determine: if people are using the meeting room without making a booking, conversely if people are making a booking without using a meeting room, if people are using the appropriate size meeting room for the number of participants and if the number and sizes of all the meeting rooms within the building meet the booking requirements.

This information is used to influence behaviour relating to the booking process to make sure they are utilised to their full potential and conceivably to adjust the number or sizes of the meeting rooms to make sure they are at effective levels. Alerts can be setup to be sent to cleaning team once a room has been vacated so it can be checked/cleaned before next meeting.



Hot Desk Monitoring

Presence sensors are installed under desks, allowing people to remotely review whether there are any spaces available for them to book. Energy savings can be gained by cutting power/HVAC etc. to unoccupied desk areas. The solution also provides data and analytics which can be used to make informed decisions on future space utilisation. On average, this type of monitoring can lead to an efficiency reduction of 20% desk space.



Washroom -Usage and Cleaning Attendance Monitoring

Cleaning is a high volume activity but with low margins within a Soft FM contract, which makes it an important focus area for achieving cost and efficiency savings.

Washroom usage can be approximated with motion sensors attached by the doors to the washroom or potentially on each cubicle, which provides higher fidelity usage data.

This data can be used to provide responsive cleaning, making more efficient use of the cleaning staffs time and provide a higher quality service. Washrooms that aren't frequently used can also be identified and potentially closed which would make better use of the buildings space. A metric has to be agreed with client re: number of users before a washroom is cleaned e.g. every 100 users. A message/alert is then sent to the nearest cleaning operative telling them of cleaning requirement. Response times are then tracked as the operative signs in (using Attendance tracking devices) and confirms they have attended washroom. This evidence-based tracking offers superior control over standard manual sign-in procedures.

Additional benefits include reduction in wasted time by providing a more productive responsive service based on actual usage. Cleaning services can be flexed to enable agile working practices, as well as ensuring the FM remains competitively priced throughout a contract duration.

Washroom: Consumables Tracking

(Hand towels, Soap Dispensers, Air Fresheners, Hand Sanitiser etc). Proximity sensors on dispensers can monitor consumable levels, and replenish based on real-time data. This can optimise (and often reduce) the number of checks and refills carried out by the maintenance team.

Waste Bin Levels

Proximity detection sensors can be used to monitor and create a work schedules when bins need emptying. This provides cleaning efficiency improvements, as well as better client satisfaction.

Hard FM

Asset Maintenance

Condition based maintenance for building assets such as air handler / fan units. Regular maintenance service checks are manually intensive and costly – often in hard to access areas that are not convenient to inspect, or hook up to traditional BMS systems. There is an increased risk to lone workers with ladders often required for access. Using simple retro-fit vibration/pressure differential sensors, it is possible to monitor the efficiency of an asset, predict time-to-failure, and service/replace parts only when necessary.

Legionella Monitoring

devicepoint™ for Healthy Water replaces traditional manual techniques with connected devices; taking real-time data readings on pipe temperature which feed into the devicepoint™ dashboard for easy remote access. This innovative solution offers huge cost savings, better accuracy to exceed regulatory requirements, and a pro-active approach to tackling this widespread health risk.

By eliminating regular manual testing work, the risk of a water system being contaminated with Legionella is significantly reduced for a fraction of the current typical cost.



devicepoint™ overview

SPICA's devicepoint™ framework provides a set of composable IOT cloud services, underpinned by best-of-breed IBM Middleware, that are agnostic of the network route – whether data comes into the platform through an MQTT enabled gateway, a SIGFOX service, or a LoRAWAN Network Server, the behaviour and capabilities of the IOT cloud services remain the same, and can be rapidly configured to deliver any number of IOT solutions.

Key features:

- Secured messaging – messages into the platform are secured and encrypted
- User security – all UI and API access into the platform is secured, and Role based access determines which devices and data people can see
- White labelling – the platform is designed to be white-labelled, so businesses can present the platform as their own engineering/service solution to clients
- Dashboards – a comprehensive set of dashboard tools allow users to visualise their data (device data and event data)
- Reports – external reports can be configured and generated
- In-flight analytics – configurable rules and triggers turn raw device data into meaningful real-world events
- Workflow and Integration – actions can be attached to events to raise alarms, notifications, and trigger other business activity in core enterprise applications (e.g. SAP, work schedules in BMS/CAFM systems)
- Cloud hosting - Anywhere/Anytime access to device data in near-real-time;
- Monthly Subscription Pricing Model - Low cost OpEx pricing, which can also incorporate other project costs (Services/hardware etc.) to minimise up-front investment, and enable faster ROI

Partnerships

With so many moving parts in the IOT value chain, we believe a strong ecosystem of specialist partners is essential to offering truly scalable edge to enterprise solutions. For example, we uniquely embed best of breed IBM software components within our devicepoint™ framework, and provide ruggedized sensor devices from Yanzi and EDMI.



Getting Started

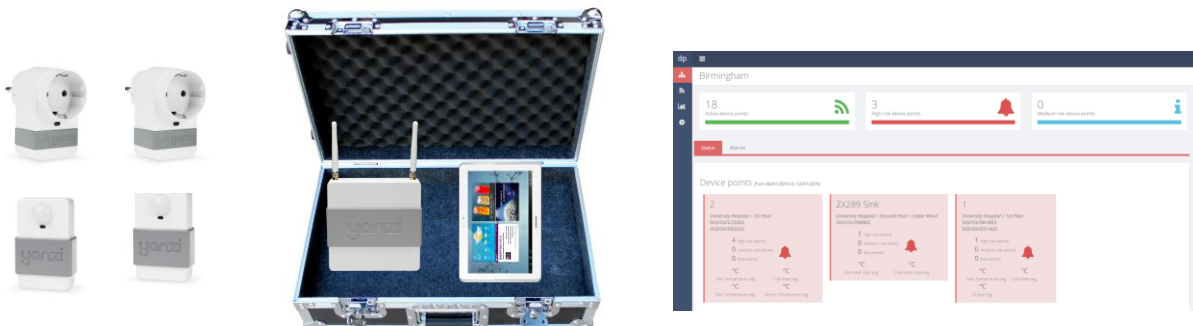
SPICA have created a proven methodology that takes clients on the journey to a production IoT solution: We not only accelerate project delivery, but can also prove the business case without needing to make large/risky investments.

The first step: SPICA IOT Discovery Workshop:

- * Raise the profile and awareness of IOT as a way to transform traditional business models
- * Uncover Connected Device candidate solutions within your business
- * Explore current internal processes / customer journeys vs proposed future state – identify value and KPI's to be realised
- * Demonstrate how SPICA can rapidly accelerate the use of IOT to generate real business ROI
- * Down-select candidate IOT use cases for further exploration / trial creation

Starter Kits

SPICA have created a number of pre-packaged offerings such as devicepoint™ for Workspace Monitoring. These include pre-configured sensor devices / gateway / network access / analytics cloud platform, and are available to trial as low cost pilot kits, as well as complete production-ready packages.



About SPICA

The Internet of Things presents new opportunities, but many businesses are still looking to understand and analyse how it will impact and integrate with their existing IT structure and management strategies. SPICA Technologies was created to bridge this gap. Our company of experts work in partnership with our clients to ensure that they are able to navigate and maximise the benefits that connected devices are able to bring - both to the bottom line and to a wide range of operational practices.

SPICA Technologies is a specialist IOT Systems Integrator that uses a combination of technical assets, hardware (device) and software components, and IOT integration expertise to help businesses capitalize on the opportunity that the Internet of Things represents. In particular, their cloud-based devicepoint™ platform is designed to accelerate the time-to-value of an end-to-end connected device solution whilst minimizing costs and implementation risks.

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Further Information

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