

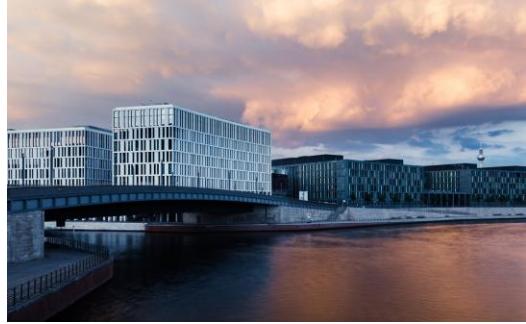
Smart
Technology

EDGE

TECHNOLOGIES

An OVG Real Estate Company

June 2019



Where we come from

EDGE Technologies is owned by OVG Real Estate, with offices in Amsterdam, Berlin, Hamburg and New York and incorporates a technology-driven operations platform directed at delivering best in class solutions for ambitious customers worldwide.



A clear
solution to
give the
world better
buildings



WELLBEING



DESIGN



SUSTAINABILITY



TECHNOLOGY



1

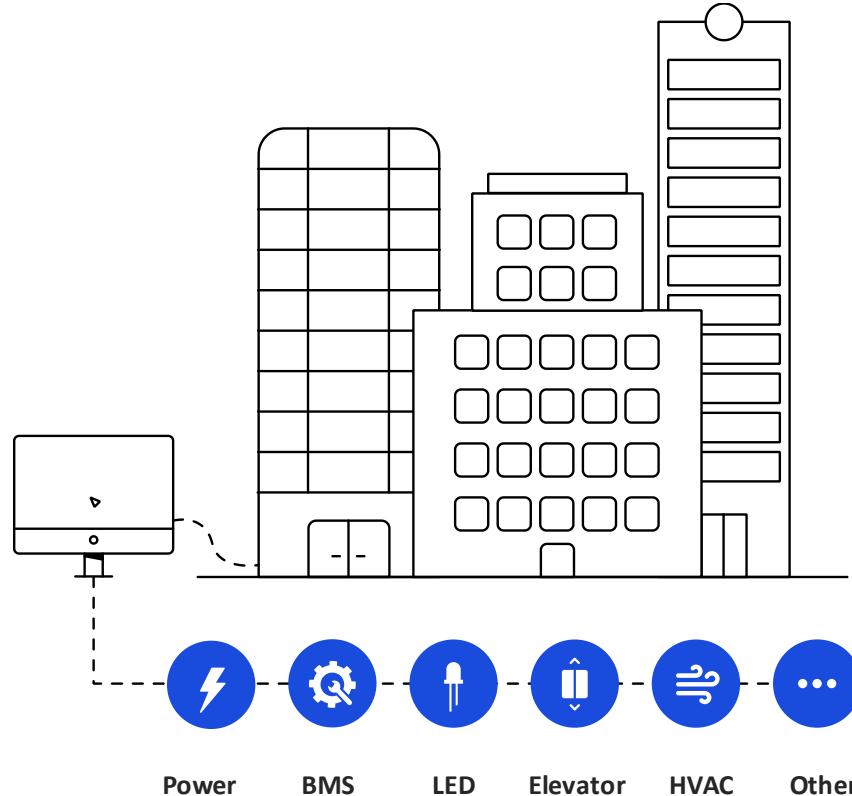
The evolution of buildings

EDGE TECHNOLOGIES



Standard building

The traditional key components of a building, like POWER, HVAC, LIGHT and others had limited software and were integrated into the Building Management System by protocols like BACnet, DALI and others. The building operator would have access to the buildings systems from the BMS or a PC running BMS software.

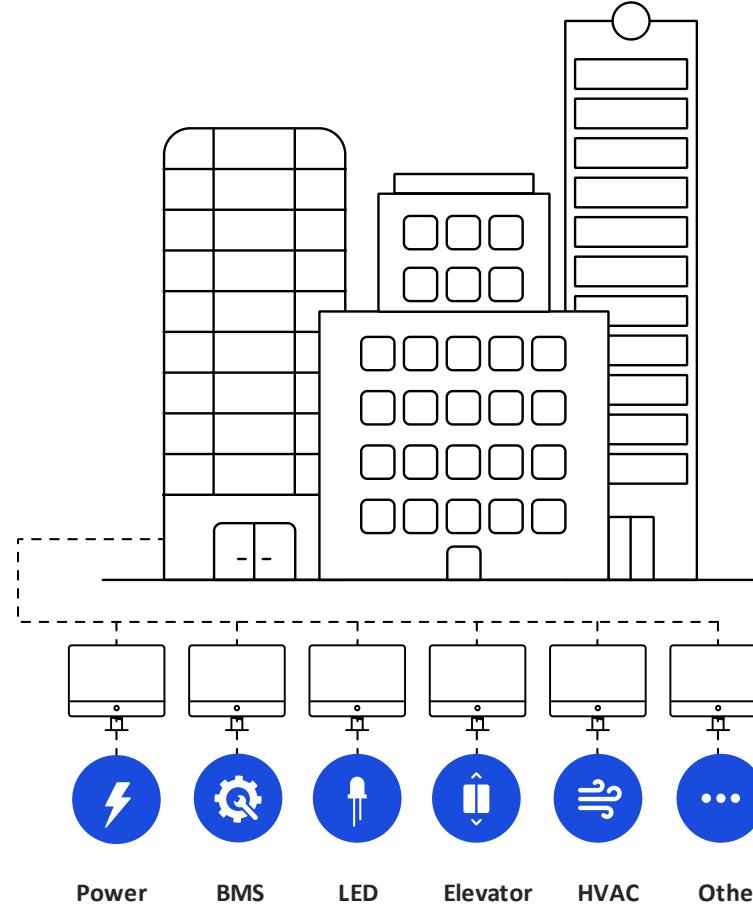


EVOLUTION OF BUILDINGS

Modern building

While the BMS has evolved into a much more capable system, many of the vendors of key components also provide PC or web-based interfaces to their technologies. Software inside the components is growing as the capability of the underlying silicon is almost endless.

As more technologies are applied into the building the fragmentation of systems, data island and a complex set of username/password and systems emerged. Such a situation may not at all lead to better buildings. Owners, managers, tenants and employees are now dealing with an abundance of data cross many different systems.

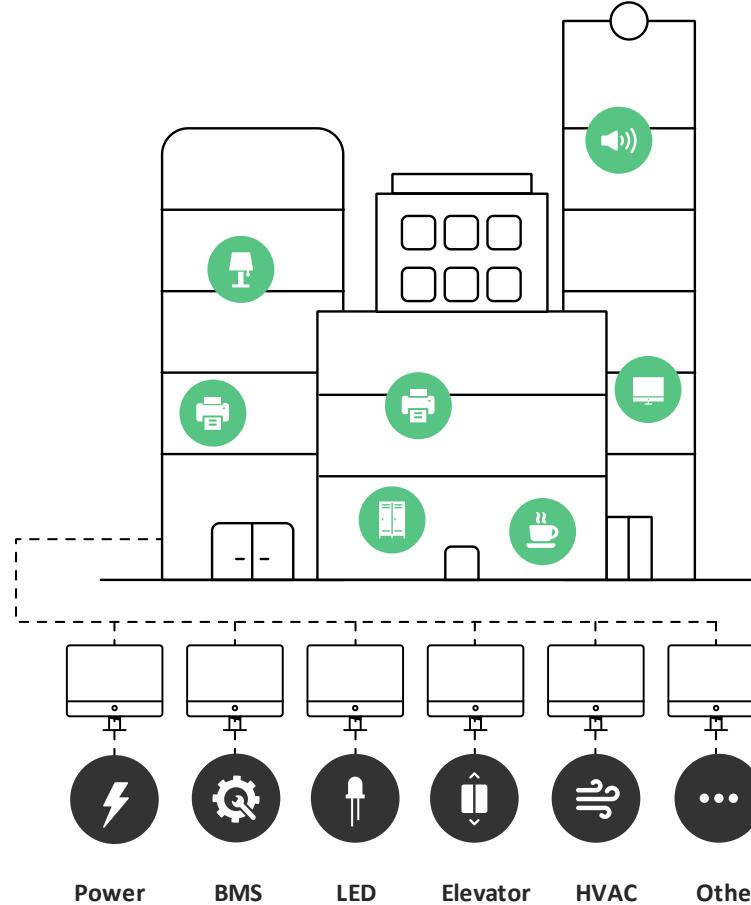


EVOLUTION OF BUILDINGS

IOT building

The traditional key components of a building, like POWER, HVAC, LIGHT and others had limited software and were integrated into the Building Management System by protocols like BACnet, DALI and others. The building operator would have access to the buildings systems from the BMS or a PC running BMS software.

An IoT building will have an IP based backbone that connects all the building related technologies, allows access to the internet and cloud as well as combines all the tenant related technologies. This type of networking is referred to as converged network.





2

Abundance of choice

EDGE TECHNOLOGIES

—

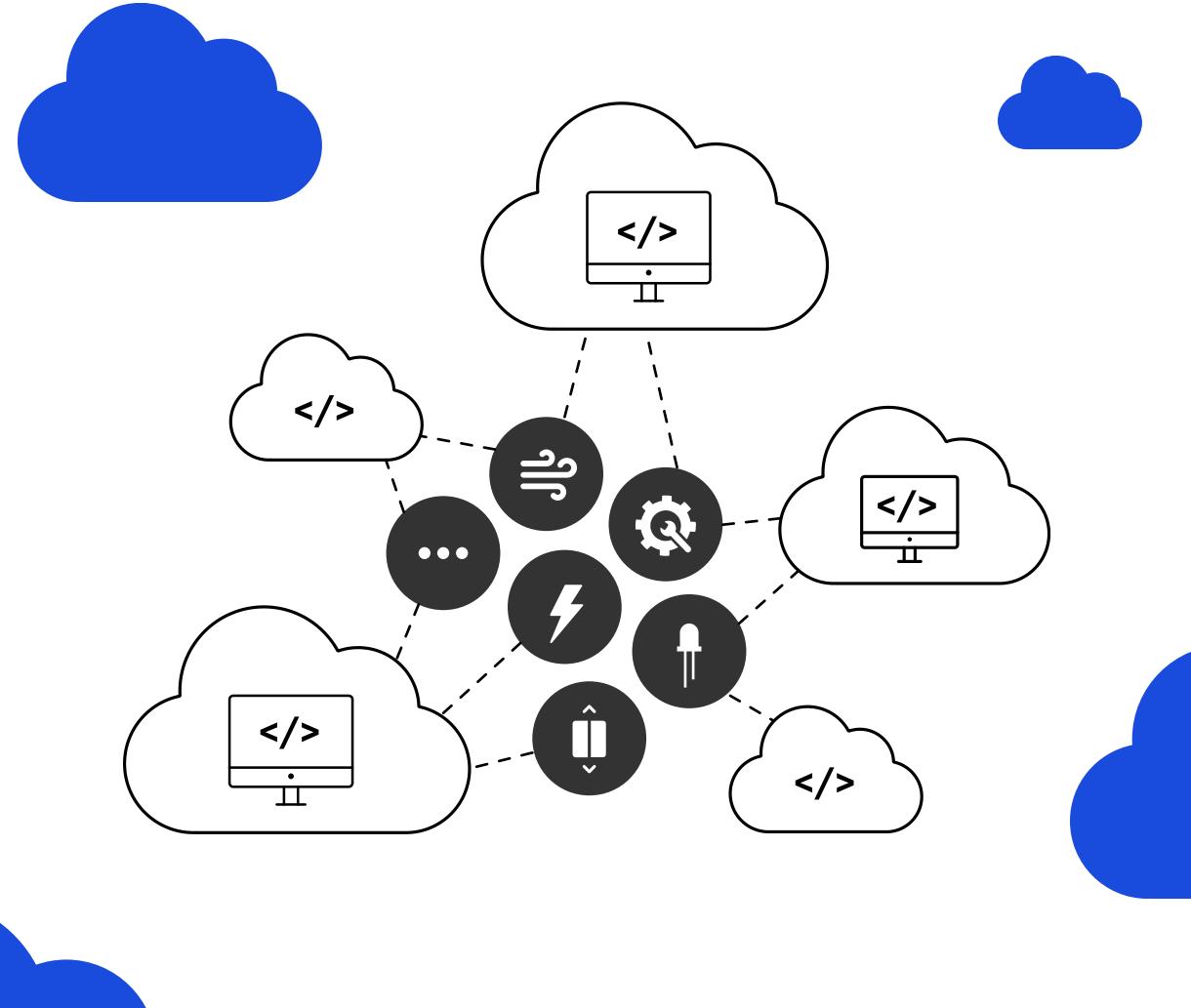
The move to cloud

Cloud computing

With the move to cloud computing the vendors are changing their business model as well as their capability in maintaining, upgrading and deploying of new features on their technology. The computing and storage capacity in the cloud is without limits and the cloud model allows easy scaling without upfront investments.

Software

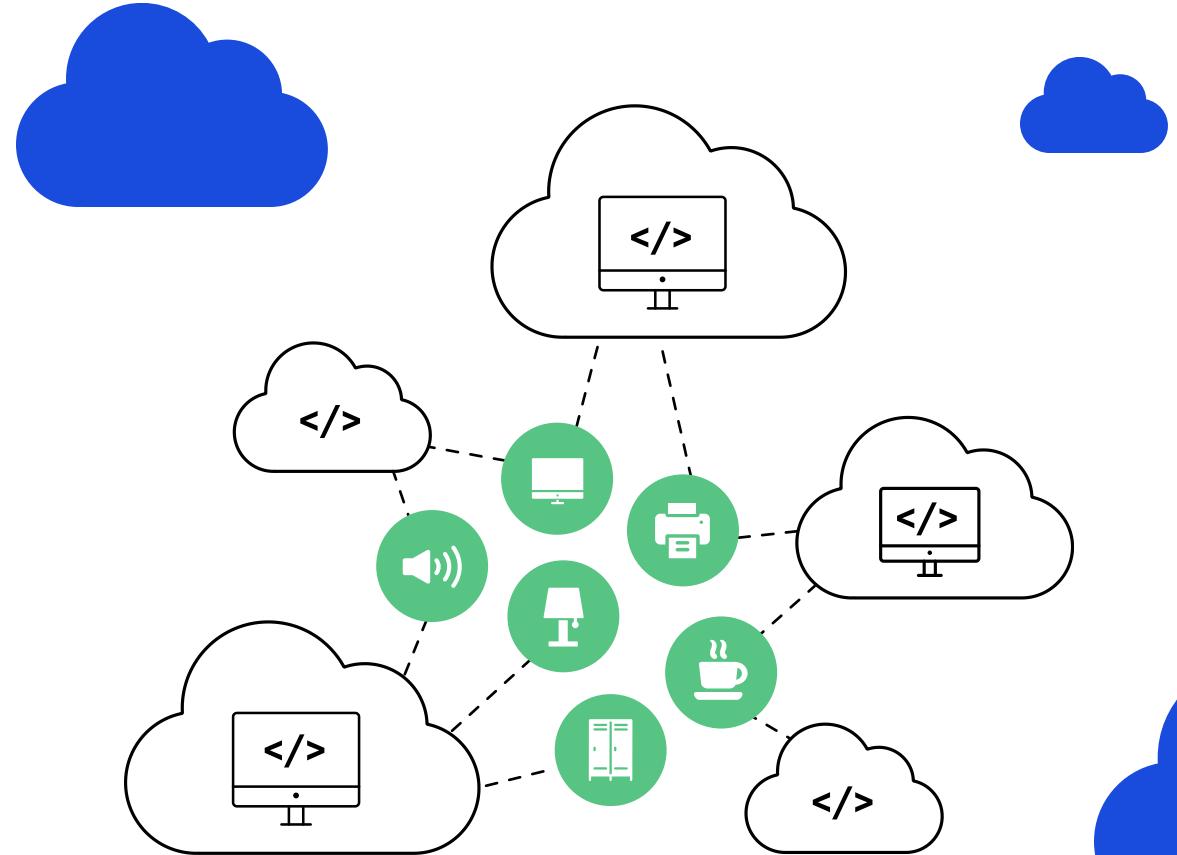
The software inside the key components is becoming more important, on top of the silicon more sensing, monitoring and predictive maintenance is possible. In general the cost of the components go down, it becomes easier to upgrade and control the assets throughout a building



—
ABUNDANCE OF CHOICE

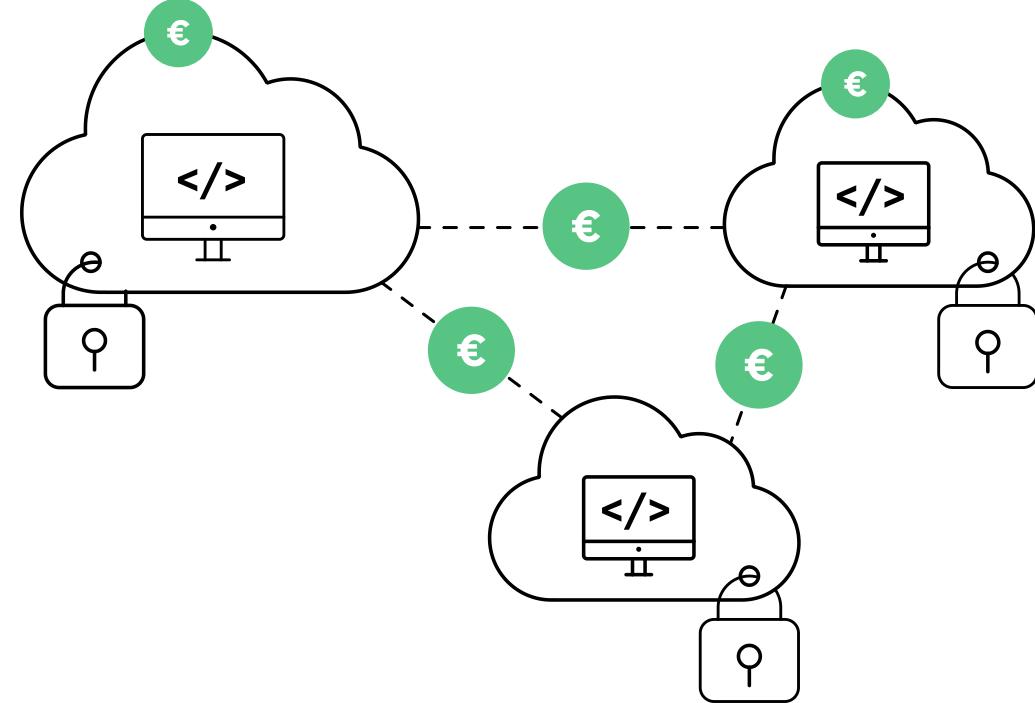
Tenant features

Sustainable, Healthy and Intelligent buildings are no longer the domain of real estate companies, a much larger role and number of technologies is now part of the portfolio, many of them don't come from the traditional building tech companies, they do not adhere to their standards but are using IP based communication technologies, software API's based on JSON and REST. Typically systems integrators. Even if large effort are put into the integration it is still far from an ideal situation.



Big data, compliance and costs

With all the different building technologies, tenant systems and communication technologies a large amount of different cloud systems are introduced. While cloud is the strategic way to go it introduces a complex set of privacy (GDPR), compliance, e-discovery and other issues. While technology allows to be connected it creates a complex system, many dependencies and by default data isolation, a far from ideal situation.

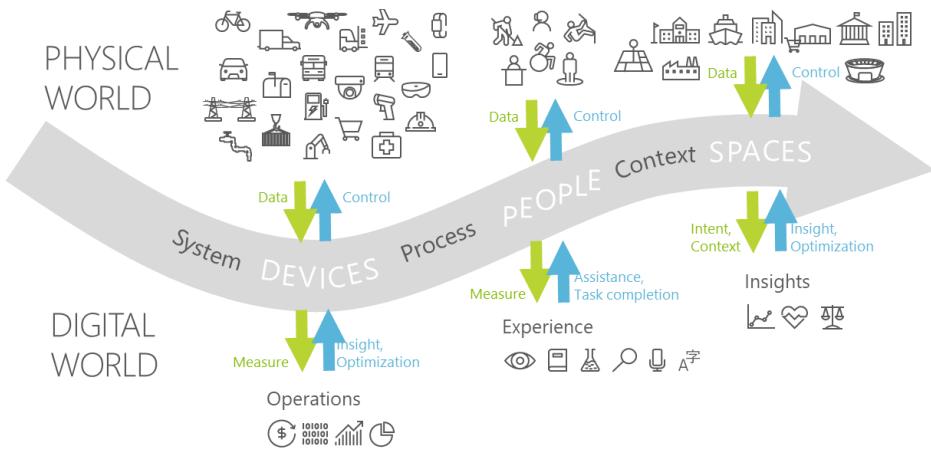


IT'S ALL ABOUT THE USER

Use case scenario's

Persona's

Over the last three years we have developed over 125 use case scenario's, using well known Persona's approach from software development methods. Persona's are people that either work in the building, visit the building, contractors, maintenance or in any other way are related to the building. The use cases define the day-to-day routine of such individuals, from their wake-up in the morning, travel to the building, park at the building, manage their work day and leave and go back later that day.





Centralized

All data sources, buildings and identities are living in one centralized platform.



Extensible

The platform is easy to extend with other data sources and additional buildings.



Interfacing

Connecting to other systems is done using industry standards



Data

Data is flowing in its most raw form directly in to the platform.



Identity & Access

Identity and access is managed within the platform. No personal data is stored unless strictly needed.



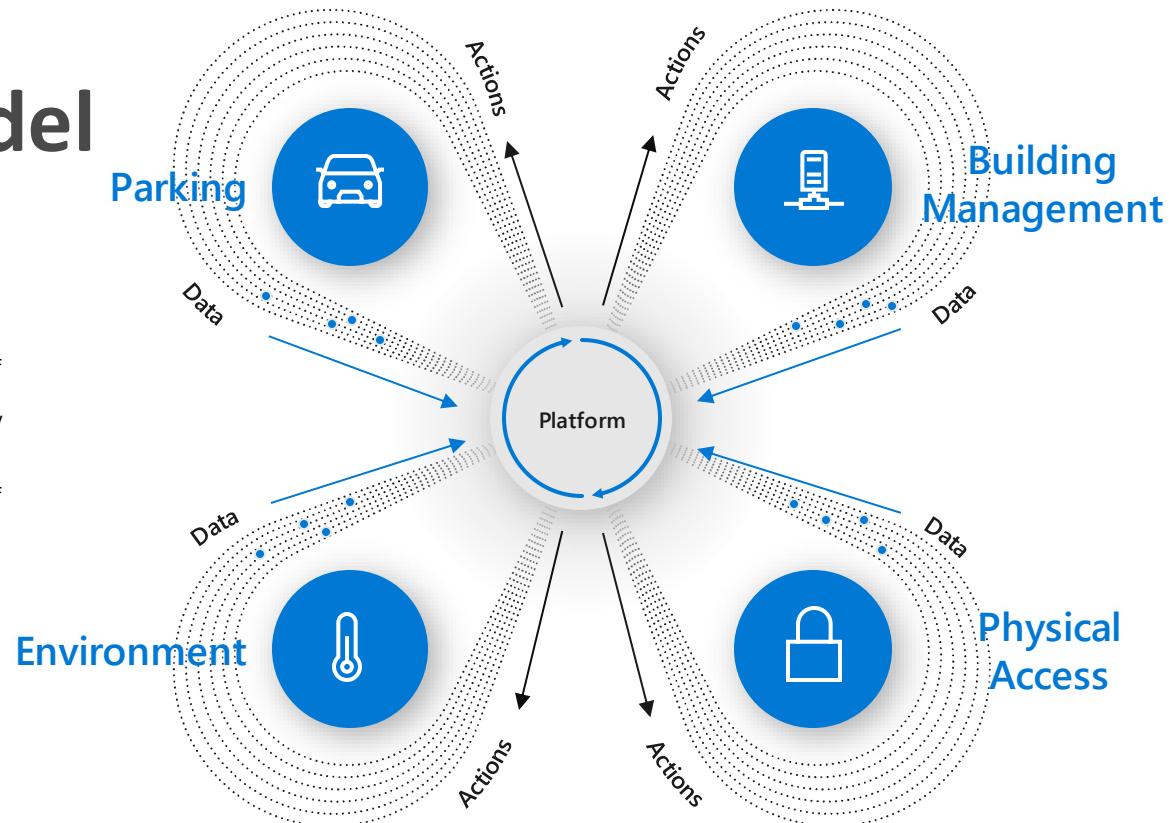
Configuration before Customization

Minimize the use of custom code to minimize complexity and cost.

Single Data Model

Data Lake

Edge Technologies intelligent building platform is a combination of all the technologies integrated into a single cloud platform. It is based on Microsoft Azure IoT and Digital Twin technology (actually the only one operation as of today). It has a single data model that allows for all of the traditional reporting based on a single truth of source data. From the data lake it allows data analytics across all of the building systems and cater for machine learning in an unprecedented way.



EDGE UX

User experience

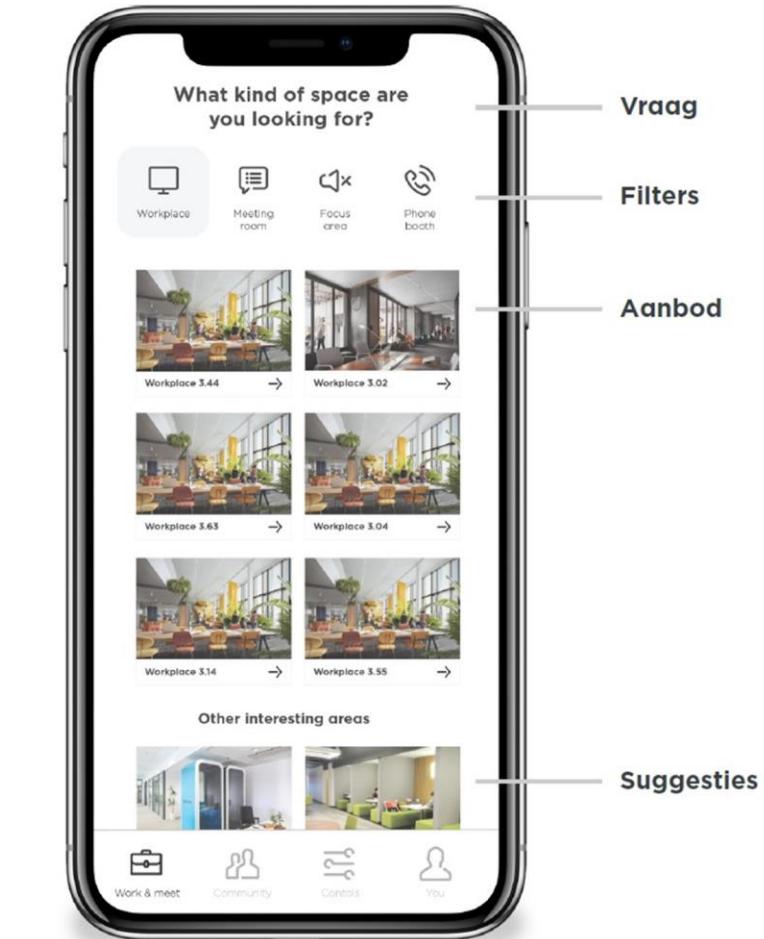
Better buildings require better user experiences, irrelevant of the use case scenario. Everyone would be better served with a seamless user experience across all the different use cases.

Here is our first huge opportunity, as we build and standardize, maintain and run, we're able to create the seamless experience across those systems, like no-one else!

IOT Cloud

As more companies are moving to the cloud they also start to adopt the IoT offerings from the cloud vendors. Due to the scale, complexity and demand for data analytics, machine learning and even voice control it is no longer economically viable to take care of those themselves. The IoT Cloud allows all of the vendors to use a slice of the system, while the vendors takes care of day-to-day availability.

/015



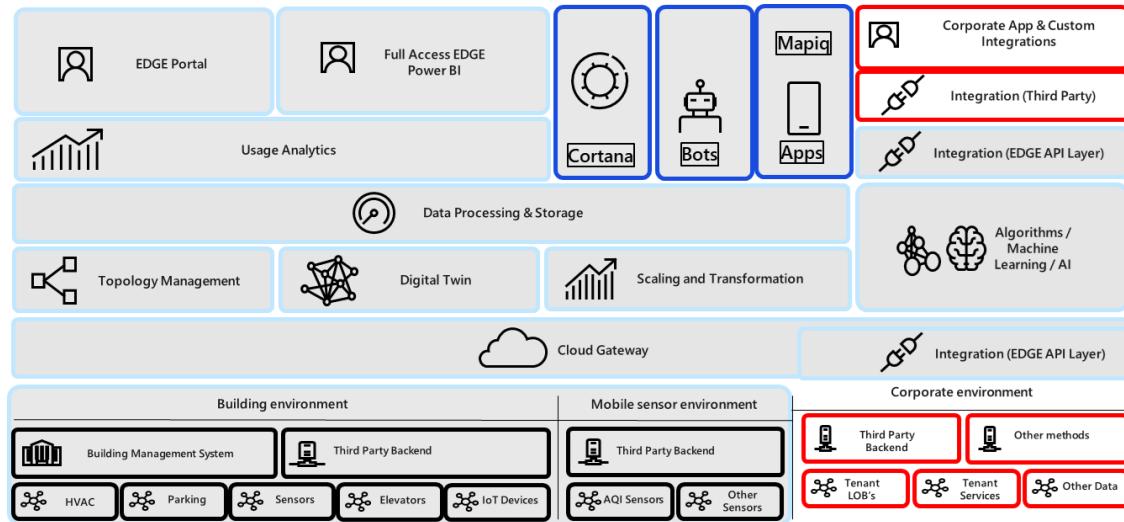
The EDGE Cloud

EDGE Cloud

Each and every underlying technology will have a cloud presence, for the simple reason of providing the business model of perpetual licensing/pay-as-you-go and maintenance and support. On top of those each company wants to learn from the data by applying machine learning and AI, as well as moving into predictive maintenance and optimization.

Here we have our second unique opportunity. Each and every vendor will have data analytics and machine learning as well as data on their own domain (elevators, light, access, lockers, coffee) but not across it. It is very unlikely than one of them will move into another domain, as the barrier for entrance is huge.

Combining the user experience, data gathering, machine learning, optimizing and prediction across those domains and over multiple building all starts by standardizing the underlying technology in the building, as we do, access and control over the data and the ability to learn from it and optimize the buildings for occupancy, energy and other areas is only possible if you 'own' all the data.



EDGE / Occupancy Overview



Latest Data From
Wednesday 22 May 2019 18...

Key Metrics

Quick overview the most important air quality metrics in selected time period.

Select Date

Or Select Time Fra...

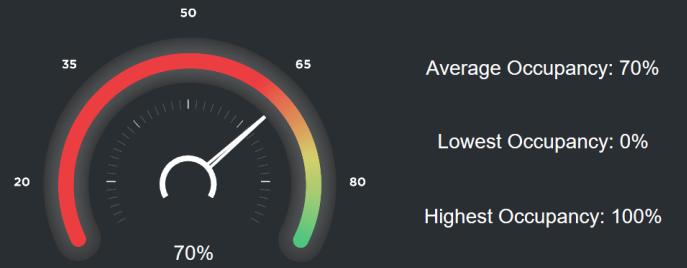
Year

Quater

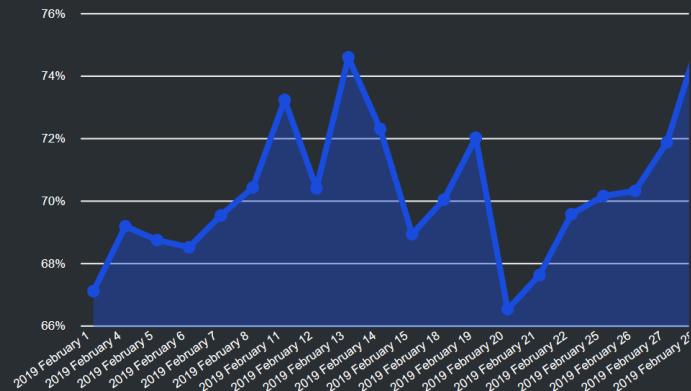
Month

Select Room Type

Optional



Occupancy % Over Time



Click to select Floor (Optional)



Average Best Performing Rooms

Recursion Area	95%
Room 1.8	95%
Room 1.6	90%
Room 1.7	89%
YC Cafe	87%
Studio 1.15	86%
Studio 3.17	85%
Room 1.2	85%
Studio 0.11	85%
Studio 1.17	84%

Average Lesser Performing Rooms

1.3 Lucid	0%
3.3 Hypnotic	0%
Studio 0.12	10%
Studio 1.16	12%
3.4 Identity	12%
1.2 Dream	19%
Studio 3.24	22%
Revelation Space	22%
Studio 3.21	23%
Studio 3.25	24%





EDGE / Air Quality Summary

Key Metrics

Quick overview the most important air quality metrics in selected time period.

Latest Data From

Wednesday 22 May 2019 18...

Select Date

Year

Select Time Frame

Year

Quater

Month

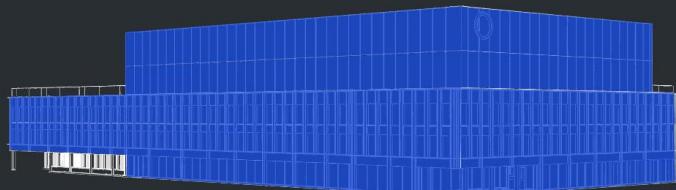
Air Quality Score



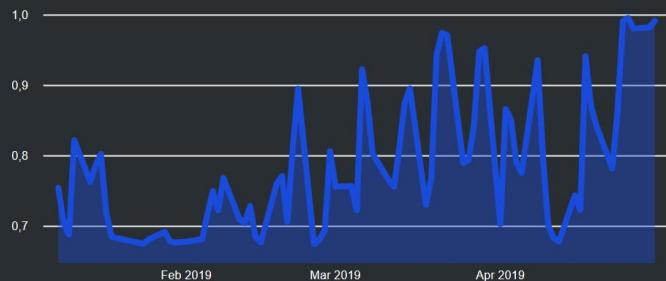
Productivity



Click to select Floor (Optional)



Air Quality Score



WELL Performance

How our air quality performs according to the International WELL Building Institute.

CO2



441 ppm

Temperature



22 °C

Relative Humidity



29%



Upgradable Sensors & Light Infrastructure

EDGE buildings are equipped with state of the art sensoring and controls all integrated within a seamless, pre-fabricated smart ceiling.

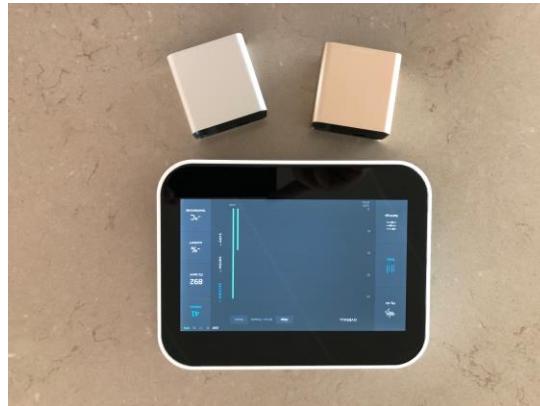


/019

Upgradable Sensors

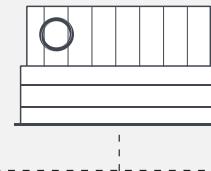
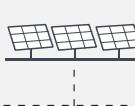
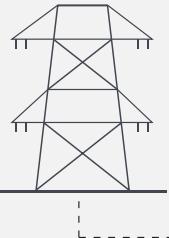
Mobile & Modular

As technology is progressing in a fast pace, we have started to develop a complete range of mobile no screwdriver needed technology. This technology includes a range of sensors that each ingest data directly into our Edge Technologies platform. We take a stepped approach to make any building an Edge building. The sensors include environmental sensors and occupancy sensors, we can now use the BLE beacons from the WiFi systems as well as WiFi analytics for localization. With people counting we can get very accurate on space utilization and room usage, driving HVAC and cleaning. With the next 6 months we will have extend our sensor capabilities to include none intrusive machine learning / prediction for machinery like chillers and pumps.



Connecting to the smart city

/021



—

Partner eco system



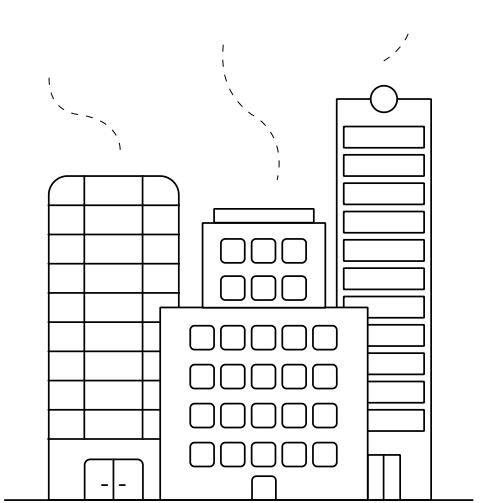
EVALAN

PHILIPS



Honeywell

SONY



/022