interact

SmartCitiesWorld

Smart buildings for sustainability and personalisation

Smart, connected technologies are helping to make buildings more efficient, productive, healthy, comfortable and personalised for the people who work in them. And because commercial buildings make up a significant percentage of the built environment, smart buildings have a significant role to play in creating a sustainable future for cities and the planet.

PROTECTING THE ENVIRONMENT, CHANGING LIVES

In October 2018, the United Nations Intergovernmental Panel on Climate Change (IPCC) Special Report on Global Warming warned that there are only 12 years left to limit global temperature increases to 2° F, the threshold generally accepted by climate scientists to avert ecological disaster.

To stay on the safe side of the threshold, "carbon pollution would have to be cut by 45 per cent by 2030 . . . and come down to zero by 2050," the report noted.

These are aggressive goals, to be sure, and achieving them will require a concerted international effort, with significant contributions from businesses and governments. Buildings and the construction industry have an integral role to play, as they together account for 36 per cent of global final energy use and 39 per cent of energy-related carbon dioxide (CO2) emissions, according to the Global Status Report 2017, a joint publication of the Global Alliance for Buildings and Construction and the International Energy Agency.

Simply put, climate goals cannot be reached without a wholesale move to highly energy-efficient and net zero buildings. As Jacques Letzelter, Signify senior vice president, public customer segment, points out, systems that reduce or eliminate carbon emissions must therefore get top priority from building owners. "Smart building solutions can make a building carbon-zero or even carbon-negative," Letzelter says.

All this comes at the cost of the comfort, productivity and safety of building occupants, right? Not at all. Smart building solutions reduce carbon emissions "while at the same time giving those that occupy them a much more flexible and comfortable environment," Letzelter notes. It's a classic win-win.

WHAT'S SMART ABOUT A SMART BUILDING?

Smart buildings draw on a range of technologies and tools that save energy, reduce waste, increase efficiency and enhance comfort and personalisation. Tech and tools such as connected LED lighting, embedded sensors, data analytics, and security and privacy measures are part and parcel of the Internet of Things (IoT), which is typically a combination of cloud and on-premise solutions.

By collecting data from connected devices and sensors in the illuminated environment, IoT technology can deliver systems that automatically adjust and respond to activities and conditions. In some cases, these systems can learn over time to anticipate people's needs or predict when maintenance needs to be done even before issues occur.

IoT-enabled systems such as these, whether for lighting, building security, parking, heating and cooling or resource scheduling, are smart so far as they go, but the IoT really begins to fulfil its promise when separate systems share data with and trigger one another. Buildings systems that are implemented in silos incur major operational inefficiencies due to lack of interoperability and the inability for different functions within a building to leverage collected data.

Increasingly, therefore, building-owners are seeking to bring different systems together on a converged network. When once-siloed systems share data and insights, both historically and in real time, building managers can achieve previously unreachable levels of energy and operational efficiency. They can also offer the kind of personalised experiences that make workspaces more comfortable and productive for the employees who use them.

GREENER BUILDINGS ARE HAPPIER BUILDINGS

Smart building technology helps building-owners reduce energy usage and costs and lower their overall carbon footprint. Green buildings are also more productive places in which to work. *Doing Right by Planet and People: The Business Case for Health and Wellbeing in Green Buildings,* an April 2018 study from the World Green Building Council, showed that companies experienced reduced employee absenteeism and a drop in operating costs after adding health and wellbeing features into green-certified buildings. Not only that, but employees felt more productive and healthier.

A great example that showcases all of these benefits is The Edge, an IoT-enabled office building in Amsterdam, the Netherlands. Under the BREEAM building certification scheme, the building received a sustainability score of 98.4 per cent, the highest ever awarded. The Edge actually produces more electricity than it consumes, thanks to a combination of smart and connected technologies, including solar panels, below-ground thermal energy storage and an Interact Office connected lighting systems that is 80 per cent more efficient than conventional illumination. Workspace personalisation features enabled by the connected lighting system and smartphone apps have significantly enhanced employee comfort and satisfaction. The building is so attractive to potential employees that applications to work for Deloitte, the building's main tenant, increased four-fold since the building opened.

Sustainability: The world's greenest office building

At The Edge, a state-of-the-art connected lighting system is managed by Interact Office software to create a more comfortable, productive and sustainable working environment.

The Edge is an innovative, 40,000 m2, multi-tenant office building in the Zuidas business district in Amsterdam. The primary design goal was to create an intuitive, comfortable and productive environment for employees that could serve as inspiration for sustainable building designs around the world.

Working closely with OVG and Deloitte, Signify delivered a connected lighting system that uses cutting-edge IoT technologies to enable data collection and insight over customised Interact Office software applications to enhance the flexibility of the open-plan office.

The system not only allows employees to personalise the lighting and temperature at their workspaces using an Interact Office smartphone app, but also provides building managers with real-time data on operations and activities over Interact Office dashboards. This data allows facility managers to maximise operational efficiency as well as reduce the building's CO_2 footprint.

The system uses nearly 6,500 connected LED luminaires to create a "digital ceiling" in the building's 15 storeys. With integrated IoT sensors in 3,000 of these luminaires, that work with Interact Office lighting management software, the system captures, stores, shares and distributes information throughout the illuminated space.

Facility managers use the Interact Office software to visualise and analyse this data, track energy consumption and

streamline maintenance operations.

"Innovation is our highest priority and we want to raise the bar in terms of data analysis, delivering new insight into the use of the office space," said Eric Ubels, CIO, Deloitte. "It shows how we can reduce CO_2 emissions from buildings and create a more sustainable world."

When The Edge first opened, Deloitte predicted overall savings per year of €100,000 in energy costs and €1.5 million in space utilisation cost savings. After 20 months of operations, Deloitte added over 1,000 employees while lowering annual cost per employee by over €1,800. Based on actual occupancy data over time, Deloitte was able to reduce the amount of space per employee from 12.6 to 7.6 square metres while improving employee comfort and satisfaction.

Personalisation: Dubai's smart university

The Hamdan Bin Mohammed Smart University (HMBSU) in Dubai, United Arab Emirates, is committed to using technology to make the learning environment more engaging, adaptive and immersive. Its students receive a combination of web-based and classroom learning that places it at the forefront of modern university education.

HBMSU aims to provide the smartest learning ecosystem among all educational institutions worldwide. With technology forming the basis for instructional delivery, it is the catalyst for creating a smart and adaptive learning environment. The university is also supporting the government's vision for Dubai to become the smartest city in the world.

Notably, the university does not have any light switches. All lighting is controlled either via a smartphone app, by motion sensors or through a central management system. The lighting also automatically adjusts to outdoor light levels.

Interact Office lighting management software is integrated with the university's building management system so that all building systems work together seamlessly. Heating, ventilation and air conditioning (HVAC) are synced to activate according to class schedules, ensuring occupant comfort and energy conservation. Sensors detect presence and lights switch on as students enter a room. Once students vacate a room, the HVAC and lighting are automatically switched off.

The lighting system and Interact Office indoor navigation are integrated with the university's app to help students find

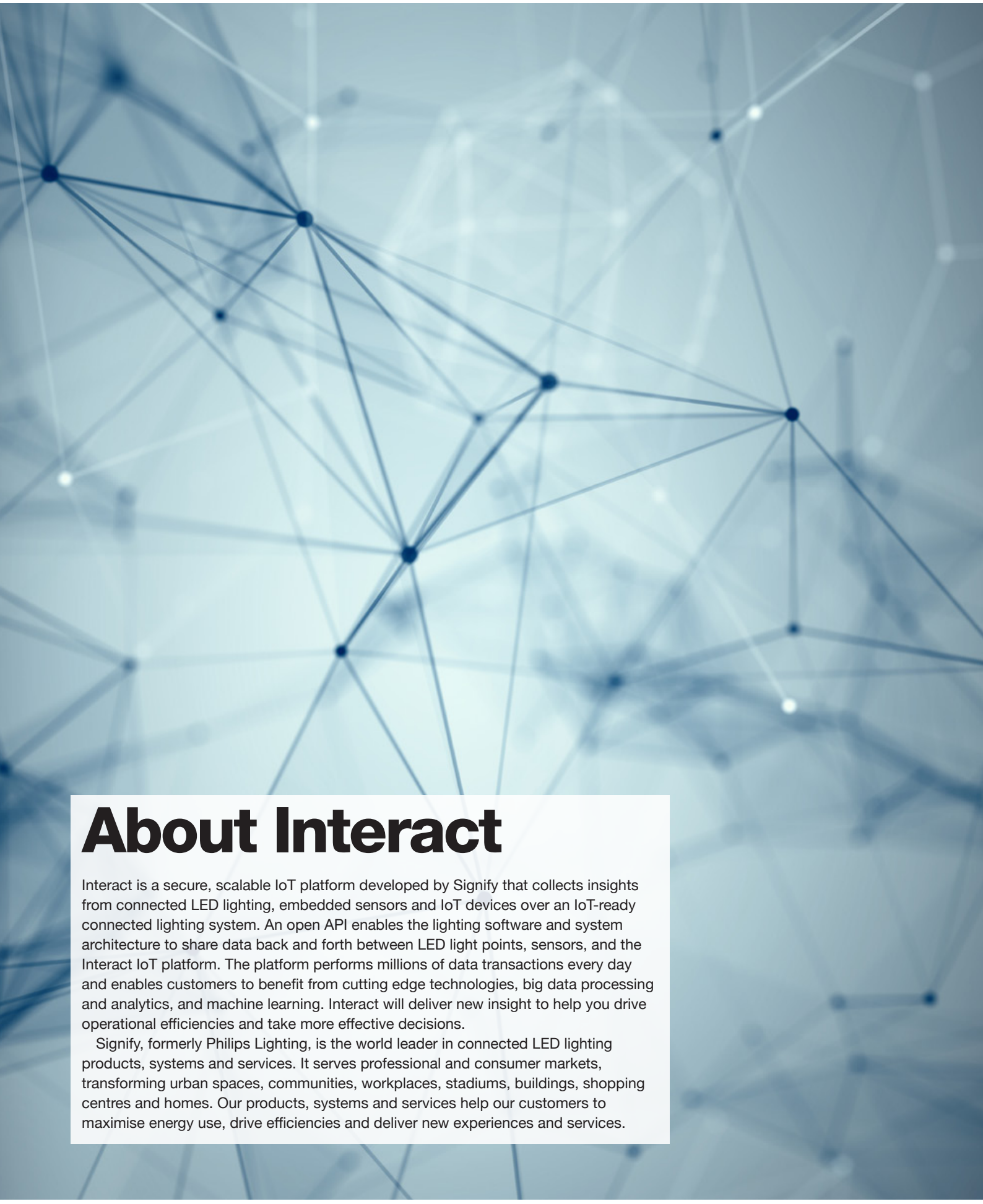
available rooms or lead them to their classes. In addition, Interact Office software and the smartphone app also provide faculty with the ability to control and personalise lighting and temperature, helping to improve student and staff comfort and performance.

Data collected from the lighting infrastructure provides information about room occupancy and usage statistics, which allows the university to make decisions in a predictive or adaptive manner. These insights help site managers maintain and maximise the building to its full potential, while requests or issues can be addressed quickly.

With connected LED lighting, sensors and Interact Office software, HBMSU can deliver on its promise of delivering a more engaging, adaptive and immersive learning experience.

"Hamdan Bin Mohammed Smart University has always been at the forefront of realising the vision of the Dubai government as it implements forward-looking initiatives that position Dubai as the smartest city in the world," said the University's Chancellor, Dr Mansoor Al Awar.

He added: "Being the first university in the world to have a smart lighting system will better equip us to deliver highly personalised learning experiences."



About Interact

Interact is a secure, scalable IoT platform developed by Signify that collects insights from connected LED lighting, embedded sensors and IoT devices over an IoT-ready connected lighting system. An open API enables the lighting software and system architecture to share data back and forth between LED light points, sensors, and the Interact IoT platform. The platform performs millions of data transactions every day and enables customers to benefit from cutting edge technologies, big data processing and analytics, and machine learning. Interact will deliver new insight to help you drive operational efficiencies and take more effective decisions.

Signify, formerly Philips Lighting, is the world leader in connected LED lighting products, systems and services. It serves professional and consumer markets, transforming urban spaces, communities, workplaces, stadiums, buildings, shopping centres and homes. Our products, systems and services help our customers to maximise energy use, drive efficiencies and deliver new experiences and services.