

What makes a building smart?

A vision for an AI-enabled future office

Air conditioning units



The building management system of a smart building not only regulates inside and outside temperature, humidity, carbon dioxide levels, noise levels and light intensity, but also analyses how all of these systems are interacting and is able to pre-empt faults. It will sense when there is a change which could lead to a maintenance issue and alert facilities management. Data is displayed on real time dashboards.

Benefit

- Health benefits to occupants through maintaining ambient conditions at all times.
- Cost savings through predictive maintenance and repairs.

Meeting rooms



As well as being bookable by app, lighting, heating, and electronic equipment within meeting rooms can be controlled and adjusted by smartphone. The smart building learns user preferences so meeting rooms are automatically adjusted when occupants enter a meeting space they have used before. Meetings are conducted using telepresence videoconferencing, with stimuli connecting remote participants.

Benefit

- Increased comfort and convenience within spaces.

Chatbot at reception



Upon arrival at reception, visitors are greeted by a chatbot which is able to speak multiple languages. If they have visited before the chatbot is able to detect this through voice and facial recognition software. The chatbot will know who the visitor met on the previous visit and which drink they chose.

Benefit

- Cost savings on front-of-house services.
- Efficiency.

Recycling point



Gamification is used to encourage sustainable and healthy behaviours of the occupants such as earning points for recycling. This is tracked through sensors on recycling points coupled with facial recognition software. Other behaviours which can be tracked and rewarded include taking the stairs instead of using the lift and shutting down electronic equipment after use.

Benefit

- Energy savings.
- Better 'green credentials'.
- Health benefits for occupants.

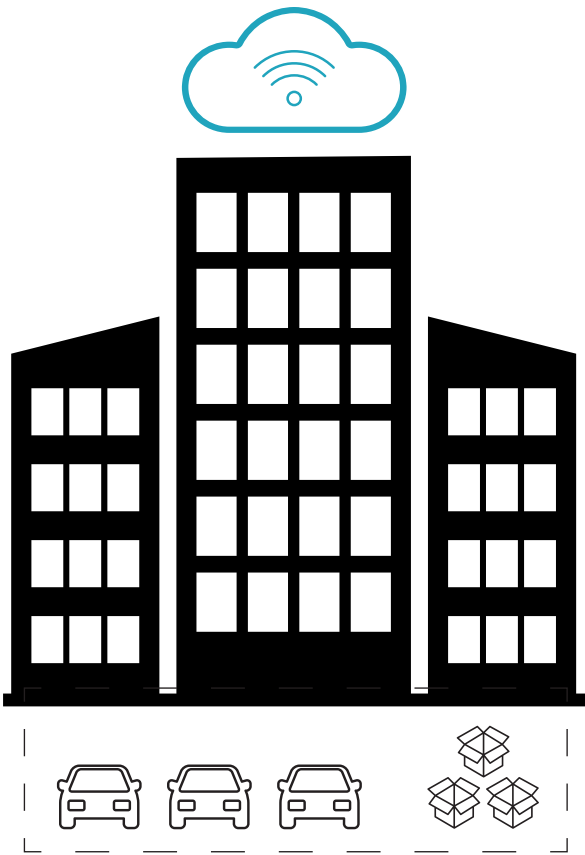
Solar panels



Solar panels on the roof generate a dedicated energy supply for the building. Smart controls share real time data on energy collection with an AI system, which learns consumption trends and makes 'store or sell' decisions that are communicated to the AI-enabled grid.

Benefit

- Energy independence.
- Additional revenue.



Smart gates



Occupants are allowed into the building using facial recognition. Visitors are sent a dedicated entrance pass to their smartphone to swipe at the gates.

Benefit

- Increased security.

Basement car park



Instead of allocated parking spaces, sensors detect available spaces and recognise registered vehicles. Visitors are directed through an app to an available space.

For visitors driving electric vehicles, intelligent meter technology allows users to control their vehicle charging remotely on a mobile device.

The smart building generates periodic reports on how much of the basement car park is in use, allowing the building owner to use the vacant space for alternative purposes, such as storing parcels as part of 'smart logistics' solutions in cities.

Benefit

- Space optimisation.
- Interaction with the grid to decrease energy consumption.
- Multi-use of spaces for additional income streams.

Hot desks



Occupants locate free desks and meeting rooms through a central app which collates data from sensors and has wayfinding navigation built in. The smart building can provide periodic reports on overall desk occupancy, allowing facilitating about whether fewer or more desks are required and which zones of the building are most popular.

Benefit

- Space optimisation.

Dark floors



Based on occupancy counts taken through desk and door sensors as well as GPS tracking of occupants. Ability to close or open zones or even whole floors during periods of low or high occupancy. When closed the zones are not heated or lit.

Benefit

- Energy savings.

Desk area with daylight



Using sensors, the smart building can inform occupants via an app which zones within the building retain the most natural daylight during the day, allowing them to move to brighter areas if preferred. In areas with no natural daylight, the electric lights follow circadian rhythms.

Benefit

- Productivity gains for occupants linked to daylight exposure.

Water supply



Rainwater is harvested and water levels monitored, alternating to mains water when rainfall is insufficient. Using AI, the building can predict how the weather forecast and the routines of building occupants will affect water needs. In high demand periods non-essential uses, such as water features, are automatically shut down.

Benefit

- Saving water.
- Lower utilities costs.

Coffee point and canteen



The smart building learns each occupant's tastes and regular behaviours. When they swipe in through the entrance gates in the morning their preferred coffee is automatically prepared so it is ready and waiting for them to collect. Hyperlocation technologies such as iBeacons send tailored offers for discounts on occupants' preferred meal choices to their mobile. Healthier options receive greater promotions.

Benefit

- Saving time through automating daily routines.
- Food waste reduction through order anticipation.
- Health benefits for occupants.