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The symbiosis of smart buildings and smart workplaces

Friday, 11 March 2016

In the world of commercial office buildings, there has been a traditional competing tension between the performance of a base building and the tenancies that occupy them. Initially driven by competing interests and designed, built and maintained by different project teams, it's perhaps not surprising to learn that these tensions still exist. By Bruce Duyshart.

Meld Strategies' Bruce Duyshart

However, in a world driven by the importance of data, sustainability and enhanced user experiences, the time has now come for divergent interests of base buildings and workplaces to come together in a more symbiotic manner.

The subjects that are now driving this outcome are smart buildings and smart workplaces.

A smart building is defined as "a building that is safer, more comfortable and productive for occupants, and more operationally efficient for owners over its lifecycle".

Relatively speaking, smart buildings are a new concept in the property world. As technologies and standards have gradually matured, based upon IP-based technologies driven at the pace of Moore's law, which describes the observation that the number of transistors in a computer integrated circuit has doubled approximately every two years since 1965, it is now possible to use arrays of meters, sensors and building dashboards to provide constant feedback on the real-time and predictive performance of buildings over their lifecycle.

With enhanced levels of monitoring now possible, this enables building and facilities managers to proactively manage assets rather than reactively manage them in the 'break-fix' manner that has been the industry norm for decades.

Whilst there are many examples of smart buildings around the world such as the San Francisco Public Utility Building and the Bullitt Centre in Seattle, one of the most talked about smart buildings in recent times, is 'The Edge' in Amsterdam. This is currently the highest BREEAM-rated building in the world and includes a wide range of sustainability and building automation system technologies to claim this title including:

- Roof and south facade facing solar panels;
- A ground heat exchange system including a 120m deep aquifer;
- IP network Power over Ethernet LED lighting;
- Automatic ventilation;
- More than 28,000 sensors;
- Energy monitoring;
- Smart meters;
- A building specific smartphone app that allows occupants to control lighting and heating preferences;
- Hot desking with the provision of only 1000 desks for 2500 employees;
- Electrical Vehicle charging and parking; and
- A robotic security vehicle.

Meanwhile, a smart workplace is defined as “an office tenancy that is safer, more comfortable, spatially efficient and productive for occupants. It shares a symbiotic and technologically integrated relationship with the building and surrounding environment in which it is located.”

The emphasis here is on the integrated relationship between the base building and the environment that surrounds it, such as a precinct or city, and the tenants that occupy the building.

Increasingly, tenants are looking for flexible workplace environments that can more easily accommodate the changing needs of their organisation. As a result, topics such as flexibility, scalability and resilience are now being used as inputs to the design of a base building.

Traditionally designed buildings often struggle to meet the increasing expectations of tenants who are now becoming more sophisticated in their needs for innovative and flexible workplaces, mandated reporting of tenancy and base building environmental impact, real-time reporting of outgoing utility costs, measurement of spatial utilisation, flexible security and the need for integrated, self-manageable building services over an extended range of building operating hours.

A current project we are collaborating on with Mirvac is their new head office on 200 George Street in Sydney. We are exploring the symbiotic relationship between the base building and their own tenancy, which will be located in the building.

On this project, we have worked with Mirvac to develop a ‘Smart Tenancy’ outcome that utilises enhanced methods of data gathering to more accurately measure the consumption of power, potable and non-potable water per floor for both base building and tenancy. We are also developing a series of building performance measurement capabilities as part of a ‘Living Lab’ that will measure the real-time performance of the building’s unique closed cavity facade system, slab deflection levels and slab temperature gradients. Other sensors will be used to measure thermal comfort, indoor air quality, acoustic comfort and lighting levels. All up, a unique combination of around 20 different sensor types will be used. The outcomes will all be displayed on a series of building dashboards.

A Smart Tenancy phone app will also be available to all staff and selected clients and visitors to Mirvac to view this information in real-time. The Smart Tenancy app will also provide Mirvac employees with information regarding the availability of work settings and meeting rooms.

Surrounded by other more rapidly evolving industries, the property industry is only just beginning to adjust its outlook and awareness of the capabilities of various technologies that can be used to create smart buildings and smart tenancies. Whilst the industry has been notoriously slow to change, it is now clear that the needs of tenants are beginning to influence the design of buildings like never before.

Bruce Duyshart is a technologist, strategist, author and facilitator with a professional background in architecture, planning, design, property development and information technology. He has been at the forefront of innovation within the property industry for the past 25 years, having successfully implemented a number of groundbreaking and award-winning initiatives. His company Meld Strategies works on projects ranging from smart buildings to smart precincts to smart cities and smart things. He recently spoke at WorkTech16 in Sydney on the topic of this article. To see a copy of this presentation, go to bruceduyshart.com or meldstrategies.com.

Aspermont Limited
Street Address613-619 Wellington Street, Perth WA Australia 6000
Postal Address PO Box 78, Leederville, WA Australia 6902