Concurrent Session H
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Session 3
Using Big Data to Optimise Tertiary Education Facility Operations
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Cara Ryan is General Manager Client Services, Australia, for the EcoBuildings Division of Schneider Electric. She has been with the company for 6 years. With 15 years' experience in the Building Efficiency industry Cara has led the development of service delivery utilising digital and analytics technology to help customers visualise, analyse and optimise their building performance.

Prior to her work with Schneider Electric, Cara has worked in facilities management and project management; in retail, healthcare, commercial buildings and public infrastructure. This experience has led to a perspective on both the challenges faced by building owners and operators, and how emerging technology can be used to address specific facility requirements. Her recent work is focussed on providing solutions that present customers with actionable information so they can work smarter, not harder. Cara holds an Honours degree in Engineering from Monash University.

In the complex, fast changing Tertiary Education environment, cost effective cloud based storage and processing power provide increasing opportunities for Facility Managers to leverage the big data generated by today's Building Management Systems. Big data analytics utilising automated Fault Detection and Diagnostic (aFDD) software offers a genuine opportunity to optimise building performance and change the way building information is managed and decisions are made.
Today's Education Facility Managers face many challenges, including prioritising maintenance, repairs and capital work in a portfolio of buildings that vary in age, technology and usage patterns. These factors not only make it difficult to operate a campus efficiently but also make it difficult to assess the impact of maintenance and capital improvement spend. Whilst Tertiary Education providers have invested significantly in new construction to meet changing education needs, it is still the case that 75% of the buildings that we will occupy and operate in 2050 have already been built today. This means Facility Managers must create greater efficiencies in existing facilities to minimise energy consumption and maximise performance, set against a backdrop of changing education delivery methods and requirements.
There's no question that buildings are getting smarter, but reducing budgets force Tertiary Education Facility Managers to manage sophisticated building systems with fewer resources. Facility Managers also face the challenge of an immediate and continuous decline in existing equipment performance. Components break or fall out of calibration, and general wear and tear often leads to a rapid decline in a building's operational efficiency. Changes in building use and occupancy can contribute to indoor air-quality problems, uncomfortable environments, and higher overall energy costs. These changes begin immediately after construction is complete.

In the past, Facility Managers have undertaken recommissioning projects to fine-tune their buildings, in order to bring the facility back to its best possible operating level. But recommissioning is often done as a reactive measure, and traditional maintenance may not identify all areas of energy waste. Operational inefficiencies that are not obvious, or do not result in discomfort, may go undetected. Undiagnosed problems such as unnecessary equipment operation, suboptimal strategies, faulty equipment or poorly tuned loops result in energy wastage and comfort issues. Using aFDD software to collect and analyse large volumes of building data, Facility Managers are presented with

prioritised, actionable information to target underlying problems, and opportunities for savings. This emerging technology allows Facility Managers to proactively identify operational problems such as equipment that needs to be repaired or replaced before critical failure.

Tools like energy dashboards let Facility Managers view a buildings performance metrics, manually spot trends, and gather insights. Dashboards can also generate reports and provide data for public kiosks that share information about buildings performance. They can be useful in understanding building behaviour, but the data can be complex and challenging to understand and use. In fact, even if building staff have the time and skills to review and understand the data, dashboards only tell part of the story about how a building is performing. Facility managers can identify where inefficiencies exist but usually not why, which requires additional troubleshooting and investigation. Dashboards tell you where your energy is going, but don't reduce your consumption – this requires further considerable effort.

By better harnessing and analysing building data, Facility Managers can better realise the full return on their investment by saving energy, improving conditions and reducing maintenance issues. Emerging technologies such as big data analytics take this next step. Data analytics help to understand not only how a building is operating and where there may be inefficiencies, but why. The "why" emerges through a comprehensive view including snapshots of current operations, outlines of energy trending, alerts through the application of rules and algorithms, detailed diagnostic reports and more. Through proactively identifying operational problems that would not otherwise be detected, data analytics helps building managers gain a deeper understanding of the "why," which in turn leads to more permanent and effective solutions. AFDD findings and documentation can also be used for measurement and verification (M&V) to meet building certifications.

Ultimately, big data analytics allow Tertiary Education Facility Managers to reach and maintain a higher level of building intelligence and performance by providing a baseline, and prioritised actions to improve performance, dealing with the most impactful issues first. Given the diverse use and type of buildings on most Tertiary Education campuses, these emerging tools give Facility Managers actionable information, allowing them to maximise the impact of both their time and the Facility Management budget.