

Birkbeck builds innovation on state-of-the-art, £700,000+ data centre from 2bm

Birkbeck, University of London's decision to consolidate four equipment rooms into one data centre was prompted by a significant rebuilding and redevelopment programme. However, the college's decision to work with data centre expert 2bm has resulted in a dedicated, state-of-the-art space with a predicted Power Usage Effectiveness (PUE) rating of just 1.3.

2bm's combination of innovative cooling solutions and tailored power infrastructure within a very tight space, has enabled Birkbeck to create a flexible data centre that will continue to support the IT requirements of diverse teaching and research staff and facilitate ongoing innovation, including desktop virtualisation.



IT Reliance

Birkbeck, University of London, traces its history back to 1823. Birkbeck is London's evening University, providing 19,000 mature students each year with part-time, face to face teaching in the evenings. The college enables students from diverse social and education backgrounds to participate in a broad range of higher education and now ranks in the top 200 universities in the world, according to the 2010-2011 Times Higher Education World University Rankings.

In common with many educational establishments, the college's IT development has often been led by academic departments. As a result Birkbeck found itself with four, separate, small equipment rooms with their own cooling and UPS, each providing services to specific college departments.

However, when the estates department announced that one of these rooms had to be vacated due to forthcoming electrical work, Birkbeck decided there was an opportunity to consolidate the IT infrastructure. David Wilcox, IT Infrastructure Manager for Birkbeck's IT Services confirms, "One of the other rooms was also no longer fit for purpose; it had evolved over time and was beyond its sell by date. There was a clear opportunity to rationalise, consolidate and create a single, state-of-the-art data centre to support Birkbeck's future IT requirements."

The University also wanted to take the opportunity to improve data centre efficiency and drive down energy consumption as far as possible. "Birkbeck has a responsibility to act with due diligence and with an eye to carbon reduction commitments," Wilcox says. "The development of this new data centre would have happened anyway; but it also provided an opportunity to exploit innovative data centre designs wherever possible with a view to maximising efficiency and reducing energy usage."

Indeed, to fund the £700,000 project, the University opted for a £500,000 interest free loan from Salix, an organisation set up to accelerate investment in energy efficiency technologies across the UK public sector, to fund the project.

Complex Build

However, while the University has, for the first time, a single dedicated space in which to create a state-of-the-art data centre, the project was far from straightforward. The new space is fairly small for the number of racks required; and it is also in the centre of the building, surrounded by other space that was undergoing redevelopment. Wilcox continues, "This was a complex project, not least because the vacation of the building meant there was a specific deadline for the first phase."

It was therefore essential to work with a data centre provider that could guarantee to deliver the project on time. Birkbeck turned to data centre expert 2bm on the basis of a strong track record in delivering diverse data centre requirements. "Birkbeck had already worked with 2bm – the college uses the company's monitoring software," says Wilcox. "Following an extensive tender process it was clear that 2bm was the only company willing and able to take in to account the specific challenges associated with this data centre space."

"It was not simply a process of handing over a room and saying, 'there you go' to a supplier. This project required a lot of interaction with the other building work that was going on and therefore required a supplier capable of being extremely flexible as well as totally committed to meeting this unmissable deadline. Birkbeck was happy to put its faith in 2bm."



Innovative Approach

The primary challenge for 2bm was the delivery of 56 cabinets with a design of 240kW technical load, together with all the facilities support infrastructure required within a miniscule 180m² of floor space, and a low floor to ceiling height of 3.1m. This was achieved by the use of 2bm's innovative 'overhead conditioned air delivery system' which forms a major component of the contained cold aisle pods.

The conditioned air is supplied to the pods using high efficiency perimeter chilled water fan coil units. This negated the need for a raised access floor which would have been impossible to install without the requirement for more space. New free cooling chillers are to be installed on the roof of the College and maximum free cooling is achieved by high design water flow and return temperatures.

The new data centre also required an innovative design to deliver the power infrastructure, not least because the onsite restrictions precluded the use of a generator to deliver back up. Instead, full resilience is provided by Riello's high efficiency MP HIP models positioned in a separate switch room together with new metered electrical panel boards and Power Distribution Units (PDUs).

2bm also took the opportunity to introduce a range of energy saving techniques to the data centre design. These include reflective wall surfaces, white powder coated racks with compliant contrasting hinges, hinges and door leading edges, low energy luminaries with proximity switching, and blanking panels to seal unused 'U' space in the cabinets.

Flexible Design

A key consideration of the design is that while the data centre resources are being consolidated, the space is still being shared by four distinct management entities.

"The equipment is managed by separate teams," Wilcox explains. "It was therefore essential to have full flexibility about where the equipment can be located and managed."

It was also important to put in place a way of measuring it was also important to put in place a way of measuring the resources used by each management team. As part of the data centre design, 2bm included its Sensorium metering solution which keeps track of the performance of the equipment and ancillary plant, including the cooling unit, UPS and PDUs.

The primary role of the Sensorium metering solution is to raise an alert if there is a problem with any of the equipment, enabling early intervention. However, as Wilcox explains, it is also valuable to be able to track and manage the amount of power being used. "Insight into power consumption is key to ensure the data centre is operating as efficiently as possible," Wilcox comments.

Adding, "At the moment there is no requirement to apportion costs on the basis of power consumption – it is currently done on the basis of space occupied. But that may change in the future and the 2bm metering solution would enable Birkbeck to rapidly make that shift to charging power usage on a per cabinet basis."



Energy Efficient

Throughout the project, 2bm and Birkbeck had regular progress meetings both to ensure it was on track and to provide the University with the information it required to plan its equipment migration. The initial phase was completed on time, enabling Birkbeck to start migrating equipment while 2bm carried on with the second phase of the project.

“Throughout the process, 2bm has been flexible and has taken a constructive approach to any challenges, while introducing innovative designs where possible.” Wilcox confirmed.

The result of this focus on energy efficiency has been an overall reduction in power consumption. Indeed, this new data centre is projected to have a Power Usage Effectiveness (PUE) rating in the region of 1.3 compared to a typical industry standard of 2.5 PUE.

Critically, however, the data centre will support the college’s ongoing provision of technology. “The reliance upon IT within Birkbeck cannot be underestimated,” he says. “We have to be as flexible and reactive in terms of the IT requirements of our teachers and researchers as possible and anything that provides better protection and an improvement in the uptime performance is incredibly valuable.”

Indeed, the new space is enabling Birkbeck to explore other avenues, including the adoption of desktop virtualisation, which will demand additional data centre equipment. “Having a dedicated data centre environment which has been designed and planned for now and the future will allow us the additional capacity within this existing environment for us to take advantage of the significant benefits provided by desktop virtualisation. Without this we would not even have been able to consider it,” Wilcox concludes.

