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Delivering more from data

University of Cambridge

The Challenge

- Improve processes and sharing of information through enhanced data collection and management

The Benefits

- Information is more transparent and visible and can be viewed and explored in one place
- Significant resource and efficiency savings through new processes
- Improved productivity and accuracy of data collection
- Better decision-making based on more accurate data

The University of Cambridge's Estate Management team has a substantial operational estate to maintain. As well as plan for and manage the organisation's estate development programme, it is also charged with promoting the University's environmental sustainability initiative. In 2018 the Space Data team created an innovative digital Estate Map with ArcGIS Online, converting data from multiple file formats and introduced new processes to provide accurate estate information to staff and stakeholders.

The Challenge

With more than 350 operational buildings to sustain, keep secure and safe and nearly 700 acres of land to maintain, the University of Cambridge's Estate Department manages an operational estate currently valued at £3 billion**.   The estate's broad and complex nature presents many demanding challenges from looking after buildings over 800 years old, Grade 1 Listed and protected by English Heritage and the University Farm, to highly specialised buildings used for teaching and research. In addition, there is an investment portfolio of leased residential and commercial properties. However, while the University of Cambridge is a collegiate university, the University Estate does not include all the College properties.

The Estate Department's Space Data team is responsible for maintaining source data and keeping an up-to-date record of all CAD drawings and floor plans of the University's buildings.   A major frustration for them was not being able to show this data on one single map in a more detailed way. The University's official map was limited, showing Cambridge only, whereas the estate has buildings and land assets outside of Cambridge in Ely, Leicester and London. They also relied on a supply of data updates and new additions from colleagues across the department.

The team was looking for a way to improve processes and facilitate improved sharing of information across the University, with people of different skill levels.   While the team had no previous working knowledge of GIS, it was keen to identify a system that could maintain data and provide accurate estate information to staff and stakeholders.

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> ❝ We were really keen to learn how we could use ArcGIS to improve processes and make our work more visible, making it easier for people to understand what we own and what we have an interest in. ❞

Dawn Birch, Estate Data Coordinator, Space Data Team, University of Cambridge

3D model of the planned Cavendish Laboratory

The Solution

Following its attendance at an AUDE (the Association of University Directors of Estates) facilities management event, the Space Data team recognised the potential of ArcGIS as the software platform that could not only fulfil its primary requirements, but also create a valuable gateway to further information and functions.   The University had been using ArcGIS as a teaching tool for years, but the technology had not previously been used for the administration of data and asset management, or as a sharing and collaboration tool.

"We were really keen to learn how we could use ArcGIS to improve processes and to make our work more visible, making it easier for people to understand what we own and what we have an interest in," said Dawn Birch, Estate Data Coordinator, Space Data Team, University of Cambridge.

The team contracted an Esri Professional Services Embedded Product Specialist (EPS), an experienced GIS expert, who worked with the Space Data team, three days a week, in their office in Cambridge. Given the Space Data team was relatively new to GIS and had only had a few days training, the EPS worked in close collaboration with them showing how to bring new GIS ideas to life and embed ArcGIS functionality into existing business processes. The EPS also passed on knowledge and helped drive a new exchange of ideas on how the team could benefit from the latest enhancements to the ArcGIS platform.

Initially the team used ArcGIS Pro to convert its CAD data to GIS formats to use in ArcGIS Online. Processes were put in place to manage all internal data and make it accessible in an organised folder structure.   Visualising the data in a digital Estate Map was the first time that the entirety of the estate's holdings could be seen and explored in one place. Using existing CAD data appended to OS MasterMap data, extruded by building height, the new 3D map delivered a completely different perspective of the whole campus.

In terms of data collection, estate surveys had previously been undertaken using unreliable paper-based collection. The Space Data team replaced this process with mobile data collection using the Survey123 for ArcGIS app, a digital solution that works on smart devices, laptops or desktops even in disconnected environments.   Surveyors were able to highlight more precise details of where buildings and assets such as bicycle sheds are located and, having purchased a new GNSS receiver, are now working alongside their IT colleagues on hosting and updating the entire cable network within ArcGIS.

The EPS engagement also led to the Space Data team joining Esri's Early Adopter Community, giving them the opportunity to try the latest Esri technology before its public release.

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> " The new digital Estate Map is not just useful for me, but when explaining where a department is and who is the best contact to other colleagues at the University. It's a valuable tool which I'm sure I will use on a regular basis. "

Steve Matthews, Facilities Support Manager, University of Cambridge
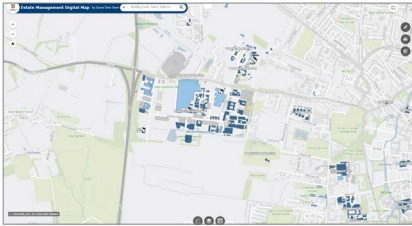
Estate Management Digital Map

Biodiversity Map

The Benefits

Improved Sharing of Information

Estate holdings are more transparent and visible through the digital Estate Map and can be viewed and explored in one place. It replaces previous silos of data and information held across different departments, making vital information and accurate updates and additions available to stakeholders across the organisation. Explorer mobile App for ArcGIS also gives colleagues access to data and the digital Estate Map while out and around the estate.

Better Exploitation of Existing Data

The team can now view and map biodiversity data relating to the estate, visualising data that they had not been able to previously do so. This includes where current land is in relation to buildings, site boundaries, city wildlife sightings, local nature reserves and water features; data that previously existed but the team had been unable to visualise and share in meaningful way.

Process Improvements and Increased Operational Efficiency

Digital recreation of previously paper-based surveys has resulted in significant resource savings. Office-based employees no longer need to manually enter data into spreadsheets and databases as this can be undertaken in real-time, by surveyors out on the estate, using ArcGIS mobile apps.

Supporting Future Planning

Multiple projects using ArcGIS have been earmarked to support better decision-making regarding both asset management and sustainability goals. These include tree surveys, sustainability maps and accommodation plans. As the University already used ArcGIS for teaching purposes, it has been able to extend its use of the ArcGIS platform for minimal cost.

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