University Space Management Case Study

University of Technology, Sydney

SPACE MANAGEMENT
AXIOMATIC TECHNOLOGY LTD

Background

In October 2011, Bryce Hutchinson, Senior Building Information Officer, from the Facilities Management Operations department of the University of Technology in Sydney approached our Australian distributors TPS with a proposal to use people counters to automate reports of space utilisation/ room usage in the University.

At the time, all room usage monitoring was done by contracting a number of people with clipboards to visit every room and count the number of people in it on the hour every hour for the full day usage, over a week. The data was then entered into a database, and a set of reports was produced.

These showed Frequency, Occupancy and Utilisation for each room, and for groups of rooms (such as 'medium-sized lecture theatres', or 'classrooms').

However, there are a number of drawbacks to this approach:

- The reports are static. Once they are printed, you cannot change the grouping
- Producing them is very labour-intensive, and consequently expensive
- They only cover-one week of the year
- They didn't correlate with the timetable. You could not tell if a booking was wasted because they didn't show up or arrived late, or finished early
- It was very disruptive to the occupants of the room including the lecturer

UTS are well known for an innovative approach, and are early adopters of new technology to solve problems. In partnership with Axiomatic Technology Ltd, a Space Management solution was proposed and implemented.

The central idea was to use ceiling-mounted thermal imaging automatic people-counters to count people in and out of rooms, from small meeting rooms through to multi-entrance 300 -seat lecture theatres. The software would monitor the number of people present in each room for each 30-minute period, and then compare that with the timetable.

This would then enable reports to show:

- **Frequency** – the number of hours per day that the room is used
- **Occupancy** – the average occupancy of used periods.
- **Utilisation** – the average occupancy of all periods of the day.
- Differences between the number of people attending, the number booked to attend, and the actual room capacity.
- Differences between the number of hours the room was booked for, and the number of hours the room was occupied. Significantly, it can produce a report of ***who*** made bookings for time that was wasted (i.e. which course, or which department).

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Trial and Development

To begin with, a trial was set up consisting of around a dozen different rooms, and the report was created as an Excel spreadsheet. This certainly proved feasibility. However, as the system grew, this was found to be unmanageable and inflexible. What users wanted was to be able to do much more ad-hoc queries, with dynamic filters to choose which rooms were to be included in the report, and which parameters were to be displayed.

They were asking questions like:

- What is the Frequency/Occupancy/Utilisation (FOU) metrics for the large lecture theatres in a particular building
- How is time wasted in rooms with under 30 seats?
- What are the trends over a term or semester in student attendance?
- What times of day are busiest?

The partnership worked very well, with Axiomatic doing the development, and UTS reviewing the reports, problem solving issues, and providing the end-user feedback. Throughout, it meant that Axiomatic were developing with real test data, and were in weekly discussions with the UTS Space Management team on how the system was used, and what features they would like it to have. Conversely, UTS benefitted in having a very strong input in the sort of package that would be most useful to them in their management of the spaces (and a significant discount on the licence fee!).

At an early stage, Bryce Hutchinson inquired if it would be possible to control the air conditioning so that it is only on for booked periods when people are in the room. This is hoped to save a significant portion of the millions of dollars UTS spend each year in electricity. A trial was set up using some dedicated hardware to give a run/stop demand signal to the HVAC controllers as a proof of concept. This was very successful, and proved that there were significant savings to be made.

The next stage of the project is to implement OTOVAC, (Occupancy and Timetable Optimised Ventilation and Aircon Control), using BACnet to communicate to the controllers to signal demand (rather than using a physical relay).

So what was the return on investment for this project? UTS have been able to use the system to:

- Gather real time data giving meaningful and accurate Space Utilisation Reports
- Highlight no shows, early finishes, utilisation
- Inform future space requirements in campus redevelopments, avoiding investing in unnecessary buildings
- Monitor wasted bookings, helping to minimise the overall time wasted
- Track attendance in spaces that enable new learning delivery methods
- Investigate and reduce energy consumption - automatically turning off the air-conditioning when the room is not occupied reduces energy costs and greatly reduces our greenhouse gas emissions and our carbon foot print 24/7 - 365 days of the year.

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Results

UTS have found that the Space Management system has made a real difference to the time wasted. Lecturers know that their room usage is being monitored, and are more careful in the bookings they make for their courses.

They take more care to book a room of the right size, rather than having a small class in a big lecture theatre, and only book the number of periods they need.

Recently, a group of senior lecturers supported by the University senior management planned to build a new large lecture theatre. The Facilities Management team got involved, and using data from this software proved that the new lecture theatre was not needed, and that there was adequate capacity already in place.

That one decision saved around $5 million.

For more information, contact Axiomatic on

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