



Case Study

Space Occupancy Monitoring for Safety and Compliance

Problem statement

The total number of people allowed inside a building and on each floor is capped for the safety of occupants, in case of an emergency they need to be able to quickly evacuate the space. The occupancy levels need to be monitored and managed in real-time at a floor level, allowing FM teams to react before total capacity levels are breached to ensure a safe working environment that is compliance with fire safety regulations.

Manual checking can be time intensive and inaccurate, often resulting in a reactive approach when crowding has already started and employees are already frustrated by the lack of space, rather than proactively preventing an issue before this negative experience occurs.

We were approached by several clients to extend the real-time data monitoring, alarms and reporting in our GemEx™ platform in order to support this new use case.

How it works

Footfall sensors are installed at all entrance and exit points to the building and individual floors, this data is received, processed and analysed in real-time in the GemEx™ platform. Capacity limits and alarms are set to trigger when these are breached, these settings can be adjusted as required.

FM staff subscribe to notifications over email or SMS.

Live views can be displayed on TV screens around the building for the benefit of employees and accessed by FM staff on their mobile devices.

All captured data, including full alarm audit history is stored in the platform, there are options for viewing this in charts or exporting it for offline analysis.



There are a number of benefits in the GemEx™ solution over the previous manual approach:

- Never breach compliance levels, set escalating warning alerts when approaching max capacity.
- Demonstrate adherence to regulations with charts, reporting and alarm audit history all available in the GemEx™ platform.
- Improve employee satisfaction and reduce frustration by reducing crowding and directly providing information to help them make decisions
- Analyse long term trend data to understand how your building is really being used, support changes in working practises and make long term space planning decisions.
- Save FM teams time by eliminating manual checks, they need to respond only when warning alerts are raised.

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A typical user journey



On a busy day in the office, an FM team member receives a SMS warning alert that floor occupancy levels are high.



Employees continue to arrive to the office but can see on the live view screens where there is availability and effectively distribute themselves around the building, floor occupancy continue to rise but at a slower rate.



The system generates an additional alert that capacity is being approached. The FM team member asks employees to redistribute across the building before limits are actually breached. This intervention keeps floor capacity within acceptable levels and the alert is closed.



The data analyst looks at trend data and alarm audit history to make space planning recommendations. They identify that working with employees to adjust when they attend the office will balance out occupancy peaks, ultimately allowing a reduction in space, saving real estate costs.

Testimonial – UK Government, Department of Work and Pensions

“Our primary use case for engaging with Spica and their footfall occupancy solution was to help us meet capacity limits of the building and floors as set by our Fire Risk Assessment. The solution that Spica offers allows us to view real time occupancy levels across the building. Alert notifications can be configured in the platform so we are notified by sms or email when certain capacity thresholds are beached.

Through having the system we are able to view real time and historical occupancy data for analysis in both the platform and offline as well. This is enabling us to make workspace decisions based on hard evidence and trends rather than assumptions and manual people counting.

A spin off use case has been to launch a live data feed to the staff on floor level screens. Employees are now able to see which floors are busiest and re locate to quieter areas. From analysis of the data we hope to also advise employees to work from home during peak times. This is helping to support our smarter working initiative and flexible working approach.

As we gather greater knowledge of how the building is used, we envisage this could also allow for potential shut down of areas and energy saving initiatives.

Spica have been a good collaborative partner for the DWP overcoming some initial installation complications and being open to configuring part of the solution specific to us.”

**David Travis, Digital Spaces Strategy & Delivery Manager,
Department for Work and Pensions**

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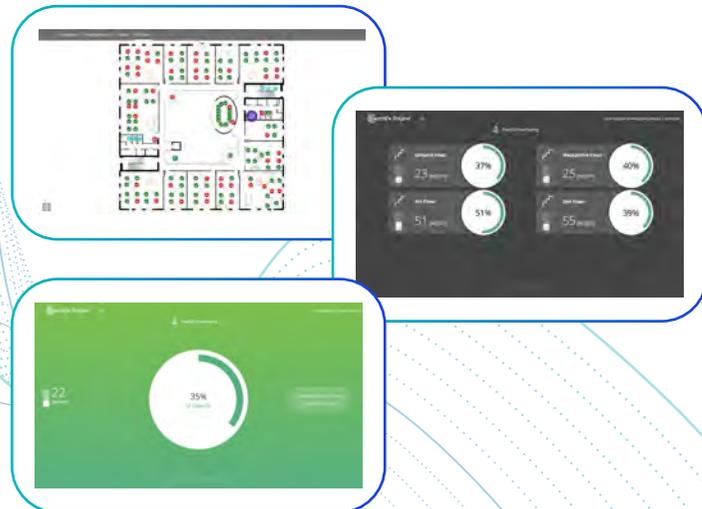


Next steps

This solution has already been repurposed to support social distancing and manage Covid-19 risk. The floor capacity limits have been reduced to respect these new limits and some customers are trialling alarms when any closed desks or meeting rooms are occupied.

The RAG view of space availability has already proved beneficial to employees when they're deciding where to work and we've been asked to investigate extending the types of space that we monitor. This could include spaces like canteens, so employees can make a quick check to decide when is best to avoid queues over lunch.

Initial setup from Spica is fast and simple – the retrofit physical installation can be completed prior to office re-population or out of hours, combined with remote software configuration. Because this solution requires relatively few devices as opposed to granular desk-level monitoring, production-ready setup is typically only 1-2 days in total (building size-dependent); enabling back-to-work occupancy control in this time-critical period.



Our Approach



Hardware checks

A high degree of accuracy is incredibly important for this use case and sometimes issues occur in a real-world install that can't be easily replicated in a lab test environment, so it was important to us to perform a series of manual checks to contrast with the sensor data and ensure the hardware was meeting our needs.

This testing identified an issue with the initial hardware choice, at times of high thoroughfare the sensors often counted 2 people entering at the same time as a single person. As a hardware agnostic platform we were able to investigate other options and integrate a more suitable device, our manual checks this time proved we had achieved the required >95% accuracy, a 15% improvement on the old sensors.



Design Approach

To support the design work for this use case we began by interviewing FM staff currently responsible for occupant capacity monitoring, across a number of clients, to better understand their needs. As well as verifying the importance of this use case, we learned that this data could be useful in a wider context to both FM teams and the people using the building.

Understanding that FM teams are often on the go, travelling around the building we designed a solution that provides alerts over email/ SMS so they can be notified when action is required by them, we also added a view that can be accessed on a mobile device with simple RAG status indicators to enable on the go decision making. We refined the usability and user experience of the design by reviewing concepts with our new users.

We also provided the ability for alarms to be generated on estimated occupancy from sensors monitoring desks and meeting rooms which allows us to offer this new use case to existing customers at no extra cost.