

Systems integrator Vanti created a new smart HQ for UBM that encompassed everything from automated HVAC to improved space utilisation

Truly connected?

The ultimate smart building – or, perhaps more correctly, intelligent building – will be one that is capable of self-management of all its systems.

Ian McMurray finds out how far away we are

A key indicator of progress is perhaps to look at jobs that are now commonplace that didn't exist 30 years ago. Offshore wind farm engineer, for example. SEO specialist. Drone operator. Web developer. Blogger. (Is that even a job?)

You can add to that list corporate social responsibility manager. He or she is the person responsible for ensuring that a company's moral practices are sound. That can mean responsible sourcing of raw materials. It can mean ethical manufacturing. And it can mean minimising a company's environmental footprint. That, in turn, means reducing energy consumption – which means minimising the use of power in systems such as heating, lighting and cooling.

That need – driven, perhaps, as much by its bottom line impact as by a desire to save the planet – gave rise firstly to what were called building automation systems (BAS) and then to intelligent/smart buildings that used a range of sensors to measure key parameters and adjust the relevant systems in response.

Rapid growth

It's an industry that, unsurprisingly, has not only grown but grown rapidly – and continues to do so. *MarketsAndMarkets*, for example, believes it will grow sixfold from \$5.71bn in 2016 to \$31.74bn by 2022. That's a CAGR in excess of 33%.

Alwyn Howie, head of enterprise solutions at Siemens, has slightly different figures – but they're no less compelling. "The smart buildings market is growing at quite an aggressive rate," he believes. "Globally, the market is growing from \$18bn to an estimated \$34bn by 2023 – based on several industry reports. Europe equates to 24% of the market, with the UK, Spain, Germany and France the key growth regions."

Also seeing growth is Danish company UbiqSense. "We deliver sensors to smart buildings, and it appears there is a healthy appetite within our customer base to make investments in making buildings smarter," notes Christian Bjerrum-Niese, who is head of sales and business development. "Since our sensor products are enabling whole new means of extracting information about building

usage, we are seeing only a low degree of competition and also limited disruption. It is the confidence in working with a new technology that is limiting this greenfield market, and we expect to see continued, rapid market expansion in the coming years."

No less enthused is Simon Ward, who is director of sales, UK and Ireland at Distech Controls. "The market for smart commercial buildings is definitely growing and people are becoming more interested in what the technology can offer," he says. "But: there is still a question mark over what smart

Key Points

- The smart/intelligent building market is growing rapidly – as much as sixfold between 2016 and 2022
- Today, individual systems within a building remain islands, but there is widespread acknowledgement that this should and will change
- The self-managing building is still some way away – and may, in fact, never become a reality because of user resistance
- IoT is seen to be a key development, with IoT devices bringing new opportunities to smart buildings

buildings actually means. The aspect of having connected systems is understood – but taking that a step further into IoT, that's where we find there is more learning to be done. However, we are seeing more end users enquire about smart buildings as they are beginning to understand the benefits of the technology for them and their buildings. It's about justifying what the technology can provide – its ROI, in basic terms.”

Continuum

Ward implicitly raises an interesting point. For many, the terms 'smart buildings' and 'intelligent buildings' are interchangeable – but master systems integrator Vanti believes a distinction needs to be made, describing a continuum from smart buildings to intelligent buildings – with the latter leveraging technologies such as machine learning to become capable of self-optimisation.

Vanti's Mike Brooman, however, neatly summarises where the smart buildings market is. “We're no longer being asked 'What is it?'” he smiles. “Now, the question is 'How do I get one?'”

In 2019, then, what is the state of the market in terms of that continuum? Are we even close to truly intelligent buildings? A vital building

block in the creation of a truly intelligent building is the integration of all the systems within it – something which has, traditionally, been hard to achieve in an industry that has seen a plethora of not-necessarily-compatible communications protocols – such as BACnet, KNX and Modbus establish themselves.



'There is a broad consensus that interoperability and connectivity standards are key if we are to capitalise on the potential for smart buildings globally'
Oliver Iltisberger, ABB

“There is a broad consensus that interoperability and connectivity standards are key if we are to capitalise on the potential for smart buildings globally,” acknowledges Oliver Iltisberger, managing director of ABB's smart buildings business. “As smarter

solutions continue to develop, we believe that interoperability will remain key, with a strong focus on ensuring that different products and solutions can operate together in harmony. The ideal solution would be that all products can be easily combined regardless of which brand or business they are developed by.”

Plethora of protocols

“There are, and will continue to be, a plethora of systems integration protocols,” explains Brooman. “In terms of providing best of breed technology to end users, integrators and their chosen building technology platforms will need to support as many of these as necessary to create the in-building experience. It is highly unlikely one protocol will 'rule them all' in the short to mid-term.”

That doesn't sound promising. Bjerrum-Niese, however, sees some signs of a transition. “Our customers most commonly request BACnet interoperability, and KNX to a lesser extent. We see no demand for Modbus at all,” he says. “But: we're also seeing new demand for interoperability with the wireless bearer protocols being used in IoT – WiFi, Bluetooth, LoRaWAN, Sigfox and NB-IOT.

Speaking your language

DICENTIS Interpreter desk

The new DICENTIS Interpreter desk complies with current and future market requirements, and provides interpreters maximum freedom to focus on their job. The intuitive and ergonomic design, together with a state-of-the-art IP-based DICENTIS platform, results in a highly flexible interpreting solution for up to 100 interpreted languages.

Find out more at boschsecurity.com



BOSCH
Invented for life

5-8 February 2019
Amsterdam, RAI, NL

**Integrated
Systems
Europe**

Hall 3 booth
3-B90 and 3-B100

"We're repeatedly hearing from customers and industry commentators that there is a continued demand to break the incumbents' proprietary communication protocols by means of adoption of open standards," he goes on. "Customers have witnessed in other industries how open, standardised interfaces are breaking monopolies, increasing competition and boosting innovation and there is an expectation that the market for smart buildings may equally benefit from open interface standards."

Open connectivity

Howie has a similar experience. "I wouldn't say a new standard is emerging, but more of a drive to increase the ease of connectivity/ interoperability," he notes. "Most tier one hardware manufacturers are adopting an open connectivity policy."

"Years ago, this was a big challenge," he continues. "The IT industry is still at the forefront of driving the standards – and especially the importance of cyber protection. As more and more 'edge' devices connect to smart buildings, including employees' BYOD options, ensuring cyber protection to the corporation and individual is key."



Sleek sensor design allows for discreet deployment in office buildings
Picture: Ubiqisense



'IP-based systems for AV, control and pretty much everything else are now more or less the norm'
Keith Jones, designflow

With that somewhat mixed landscape, it comes as little surprise to find that we still seem to be some distance from a situation in which building systems are truly integrated.

"The definition of smart buildings would need these systems to be connected," says Brooman. "Currently, most building systems are unaware of each other – that is, they don't provide additional functionality to users when they are 'joined up'. However, an increasing number of systems have well-developed interfaces and APIs to allow other systems or whole-building technology platforms to 'hook in' and read/write/update data or control functionality."

Unified approach

Ward picks up on the theme of APIs and their potential. "There has been a siloed approach to different systems in the past – but this is changing," he claims. "Systems integrators, specifiers and end users are all beginning to see the benefit of having a whole system approach

for their buildings. Such integration can now be achieved directly with the use of a RESTful API interface. REST – REpresentational State Transfer – is a standard way to enable IT web services to interact with software applications. With this level of integration, taking a unified approach will ensure that we can actively enhance and maintain the system infrastructure during the building life cycle."

"On the whole," agrees Howie, "building systems are still islands. The market tends to segregate base sub systems into one bucket, and additional technology such as network services/external apps into another bucket. IoT platforms such as MindSphere will help bring all points of data to align systems."

MindSphere is the cloud-based, open IoT operating system from Siemens that connects products, plants, systems, and machines, designed to enable users to harness the data generated by the IoT with advanced analytics.

"Our vision for any smart building is that it's intelligent enough to respond to the needs of its users," says Iltisberger. "To be truly smart, buildings need to be joined up – and connectivity and interoperability are key to unlocking this potential. If solutions don't 'talk' to each other and operate in isolation, then you won't reap the benefits that a truly smart building can deliver. That's why having a common operating platform – like ABB Ability – and joined up solutions are so important."

In all the discussion of the interoperability standards that will enable the intelligent buildings of the future, there is, perhaps, surprising little talk of a seemingly obvious solution – an omission that Keith Jones, a partner at system design and documentation services company designflow, rectifies. "IP-based systems for AV, control and pretty much everything else are now more or less the norm," he points out, "and should definitely be

Current connectivity standards

KNX is a royalty-free open standard administered by the KNX Association, which has over 400 members. KNX devices - commonly connected by a twisted pair bus – can manage lighting, blinds and shutters, HVAC, security systems and more. Over 7,000 products support KNX. BACnet is specifically designed for building automation and control networks. Developed under the auspices of the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE), BACnet is a standard in more than 30 countries, and an ISO global standard. Both provide for communication across an IP network.

the standard to design towards.”

Tightly intertwined

It will be interesting to see how that plays out in the smart/intelligent buildings industry given, as Jones says, AV’s headlong rush to embrace IP – with the broadcast industry in close attendance. The omission of IP from the conversation is even stranger, given that few disagree that the futures of smart/intelligent buildings and the IoT are tightly intertwined.

“The IoT – coupled with clever engineering – has been the key driver in allowing smart buildings to become a reality,” says Iltisberger. “IoT and greater connectivity has developed closer links between humans and the buildings we inhabit, giving us stronger control over all elements, from switching off lights in empty offices to making sure that buildings are secure.”

“The IoT has already delivered a huge leap forwards in the technology behind building control,” he adds. “For example, an increasing number of IP devices and sensors – from those that measure temperature, brightness and CO2 metrics – have led to new technology that improves the management of energy usage.”

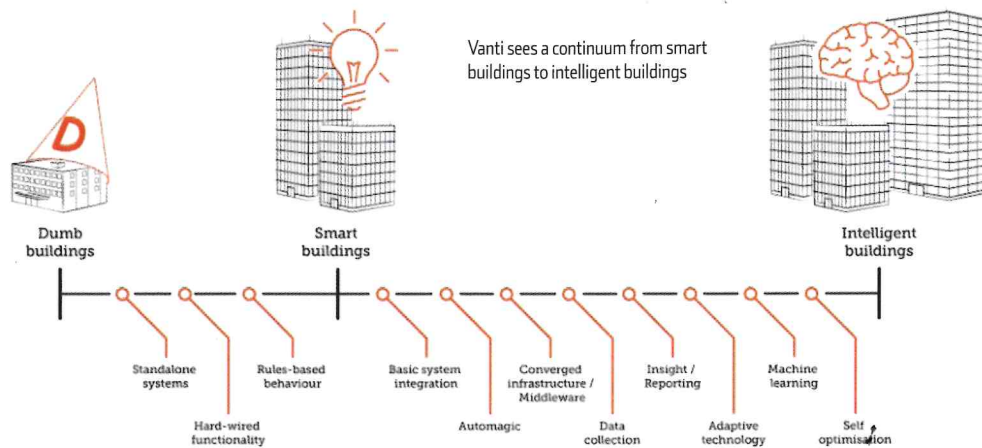
“We are a strong proponent of IoT within smart buildings,” confirms Bjerrum-Niese. “Technology cycles in the building sector are notoriously long. Instead of just being relevant to smart buildings under planning or construction, inexpensive IoT devices allow for refurbishment of existing buildings with short-term ROI.”

Brooman, however, has an interesting perspective. “IoT goes hand-in-hand with smart buildings,” he comments. “The IoT on its own is a tool for implementing great in-building experiences – but it’s not the silver bullet for making buildings smart.”

Silver bullet?

That raises the question of whether there is indeed a silver bullet. As the journey continues towards its destination of truly intelligent buildings, many see wide scale sensor deployment, big data, artificial intelligence and advanced analytics having a key role to play. Sensors will routinely and automatically collect huge amounts of data, with AI technologies helping to make sense of that data – providing vital feedback, either internally within the system or externally to a building manager.

“Big data, automated analytics, pervasive wireless sensing and cloud services are together radically changing the quality of information that can be collected, processed and analysed in real-time to enable better services provision,” says Distech’s Ward. “It means we can make more informed decisions about the operation of a building and that covers energy and cost savings as well as



Vanti sees a continuum from smart buildings to intelligent buildings

occupancy comfort and well-being.”

“Big data/AI with automation through pre-defined agreed criteria applications is an exciting area,” enthuses Siemens’ Howie. “Self-learning and self-managing buildings will be the promised land. Building managers, operators and service suppliers struggle with delivering accurate and proactive delivery to keep the buildings running at day one condition. Big data/AI can and will help to deliver constant learning and improvement for all parties as smart buildings evolve.”

“Harnessing big data is key to understanding how smart buildings are performing,” echoes Iltisberger. “But, it’s how you use this data that is key. What we’ve done at ABB is to take this big data and turn it into easy to use, bite-size intelligence for facilities and building managers. So, they can easily see from their app if there’s been a security breach, if the heating system isn’t working in a meeting room or if the lights have been left on, before it becomes a major issue.”

Exciting times

There’s the promise, then, of exciting times ahead – but Vanti’s Brooman thinks we’re still some way away. “Proper big data and AI deployments in buildings are both a long way off,” he says. “Again, these are being marketed as silver bullets to solve people’s problems. However: ask anyone who has tried to implement either solution in a building: “Were you able to get good quality, meaningful data?” Other than in a set of very rare cases, the answer is ‘no’ because the necessary infrastructure and software platforms have not been put in place to facilitate data extraction.”

The smart/intelligent buildings market is, then, one that is in transition – and that unquestionably holds significant potential, given its forecast growth. Is it an opportunity for integrators thinking of diversifying?

designflow’s Jones believes it is. His company has historically focused almost exclusively on offering its system design services to

integrators in the residential market – but 2019 sees it broadening its reach to helping design commercial projects.

“For integrators, it can be a difficult field to break into as commercial projects generally require a lot more documentation and discipline than residential,” he says. “This side of things is actually something that we help a lot of our clients out with: our job is to specify, design and document projects for integrators.”

Expertise needed

“There is,” nods Ward, “a lot of expertise needed to install and integrate a smart building.”

For Howie, it’s all about sales, technology and project delivery skills. “Understand your customers’ business needs in order to create a compelling case for your solution; be prepared to adapt to evolving technologies; and be aware that, often, you’re not just delivering systems – you may be transforming the customer’s operation,” he advises.

Of course, the smart buildings industry is far from alone in seeing the huge potential of combining sensors, big data and analytics – but finding itself unable, as yet, to move from potential to implementation. That, in turn, means that the truly self-managing building is unlikely to be with us for some time. And, even if the technology were in place, plenty believe that there will be many organisations who will continue to want to have a real person in charge of their buildings – even if the tools at his/her disposal are far more sophisticated than is the case today. It looks as if, unlike switchboard operator, lamplighters and copy typists, the building manager’s job is safe for the foreseeable future. **i**

 www.abb.com
www.designflow.co
www.distech-controls.com
www.siemens.com
www.ubiqisense.com
www.vanti.co.uk