

Use of IoT in Smart Commercial Building

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Globally, the Smart Buildings market has witnessed an upsurge in demand over the past few years in part due to growing awareness and need for energy efficient buildings, the increased need for integrated security & safety, because of growing initiatives by the government authorities and in part because of the rising adoption of IoT platforms within building automation technologies. In fact, a report by Market And Markets forecasts the smart building market size to grow from USD 5.73 billion in 2016 to USD 24.73 billion by 2021, at a Compound Annual Growth Rate (CAGR) of 34.0 percent during 2016-2021.

With buildings consuming 40 percent of the world's energy, there is a need for energy efficient solutions. In addition, the myriad, disparate systems such as HVAC, lighting, security, etc. that form the crux of a smart commercial building have also ushered in the need for integration and effective utilization of resources. Use of IoT and cloud-based applications make it possible to achieve these two objectives - making buildings energy efficient, comfortable, automated and truly smart. By deploying sensors, actuators and CCTVs which are in constant conversation with cloud based algorithms, Building Intelligence solutions can sense, predict and proactively manage the needs of the building occupants.

The Indian Smart Building Market

India is one of the key building automation and control system markets

registering a double-digit growth rate and is expected to grow from a value of INR 51.85bn in 2014 to INR 288bn in 2021. The advent and increased adoption of smart green energy efficient commercial buildings along with increased demand for comfort by the occupants will further catapult this building automation market toward a stellar growth paradigm.

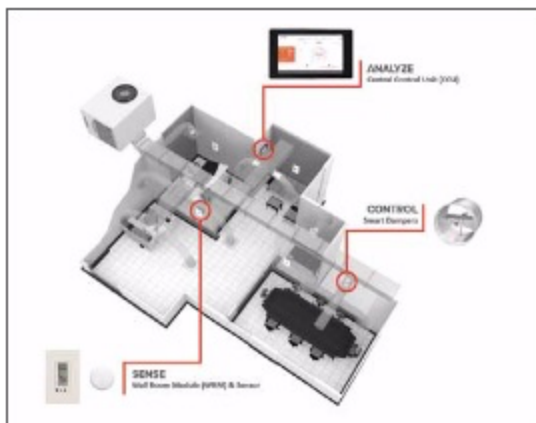
IoT Comes into Play

Energy efficiency, profitability, business continuity, optimization and protection of assets or goods in a building, physical security and surveillance, etc all form an integral part of today's business objectives when it comes to

smart commercial buildings and IoT enables all of these at a much lower cost & a much more user-friendly way than before.

Commercial Building Internet of Things, hitherto referred to as BloT, is quickly becoming an indispensable business resource. If the business objective is to reduce cost and maximize resource utilization while ensuring a better ROI, BloT fits the bill perfectly. BloT will automate a multitude of significant tasks, monitoring and analytics and make available complete and real-time views into entire operating environments within a building. Systems such as HVAC, lighting control & automation, security and surveillance, monitoring utilities, energy management, and other specific tasks such as parking garage fare taking, etc. are efficiently managed with BloT. BloT gathers and analyses data, formulates and recommends future actions making the building automated and truly smart.

In the background, this gathering and analyzing work is done by automation technologies, network solutions and machine-to-machine (M2M) communication. All of these work in





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tandem as a single integrated unit. Tools facilitating this include sensors, controllers that wirelessly connect devices, and smart objects linked together and monitored with a chip or a software. Examples of such connected items include CCTVs, CO2 and smoke detectors, smart electrical plug-ins and even televisions and music systems. Then, it also includes appliances meant for specific purposes, such as AHUs. All of these get connected, automated and programmable in a BIoT environment.

Thus, BIoT systems make buildings aware and future ready. Take, for example, 75F's award-winning 'Dynamic Air flow Balancing Technology'. Leveraging IoT technology and the power of cloud computing, the 75F solution achieves what was once thought to be only theoretically possible – continuous commissioning or real-time air balancing. Wireless Zone Controllers sense and collect hundreds of data points from the room every minute and send the data to the Central Control Unit & from there to the servers in the cloud. Each night cloud computing algorithms analyse thousands of data points, including the weather forecast & daily usage patterns that allow the system to predict future conditions. Post which, a new set of instructions are sent to the Central Control Unit and the motorised dampers are modulated a few degrees at a time to achieve the perfect balance. The system also factors in real-time events,

such as room occupancy, the position of the sun, the geographical orientation of the building and weather patterns to make continuous adjustments to the plan as needed.

BIoT can also bring in considerably energy savings by active energy cost control through time of day energy usage thereby programming the building to consume minimal energy during peak demand limiting and more during non-peak hours.

Even retrofitting of legacy or traditional building systems is now possible. More often than not, IoT systems can be easily integrated with existing building infrastructure thereby enabling them to reap the benefits offered by BIoT at an affordable cost. As BIoT supports eco-friendly building designs and energy management initiatives, HVAC and lighting control can be the biggest cost savers in a retrofit. Once integrated with BIoT, lighting in a building can be turned off and on depending on building occupancy or lights can be dimmed and brightened to suit the mood of a meeting or an event or based on time of day, and weather conditions. These steps will automatically bring electricity bills down, impact the bottom line from the very start, bringing in better ROI against investments.

Trends in the commercial buildings domain

- Buildings are becoming people-

centric with occupant's comfort and preferences being given utmost priority

- Building IoT will be expansive - From paper and soap dispenser in restrooms to air quality and cooling, all will be inter-connected and automatic
- Interoperability will become commonplace
- Role of automation in buildings will further increase - self-sensing, self-optimizing network of systems with minimal human interventions will become the order of the day.
- Air quality in buildings is being given increasing importance with the correlation between air quality & employee health & productivity now becoming more clear.
- Many of today's traditional architectures will buckle under the increasing demand for all the connected devices.
- Buildings are becoming 24x7 operations - upgrading to newer technologies like BIoT needs to happen without disruption
- To ensure security of IoT environments, intelligent routing, and analytics, networking layers will be needed as IoT lay a lot of cyber threat vulnerabilities bare

Energy use in buildings is a USD 400 billion to USD 500 billion a year problem and this explains why BIoT is riding the industry growth. Energy wastage too is a real problem and BIoT is fully equipped to negate this concern. Besides lighting and HVAC, it has several applications within a building environment which can not only reduce costs but also add to convenience. With costs of BIoT tools like sensors coming down by the day, upgrades and retrofits will become more commonplace. ■



(This article has been authored Gaurav Burman, VP of Country President, 75F)