BUILDING TECHNOLOGY MAGAZINE

OCTOBER 2026
ISSUE

BUILDING TECHNOLOGY BIZBITS

IDEAS | INSIGHTS | INNOVATION

INBAC®
Building Connectivity

OCTOBER 2026

INBAC ASSOCIATION

Building automation is powered by technology, but driven by a community committed to smarter, safer, and more sustainable buildings.

COMMUNITY

CONNECTED BUILDINGS
BY CONNECTED PEOPLE

TABLE OF CONTENTS

01 **THE EDITOR'S DESK**

By Mehul Joshi
Editor-in-Chief

02 **THE AIR WE FORGET TO DESIGN**

Author: Kinjal Shah
Designation: Director
Organization: FireProjects Pvt. Ltd.

05 **SPEAKING THE SAME LANGUAGE: WHY INTEROPERABILITY AND STANDARDIZATION MATTER IN IBMS.**

Author: Vinayak Mishra
Designation: IBMS Sales Expert

08 **BEYOND COMMISSIONING: BUILDING AN IBMS THAT DELIVERS, AND KEEPS DELIVERING**

Author: Bharat Yadav
Designation: Director
Organization: Technik Infinite Solutions Pvt. Ltd.

12 **ORGATEC ADVERTISEMENT**

13 **CAN YOUR BUILDING KEEP UP WITH THE AIR OUTSIDE?**

Author: Nimish S Pandya
Designation: Director
Organization:Inferno Disruptive Controls.

16 **WHERE CITIES THINK: LESSONS FROM GIFT CITY, GANDHINAGAR, GUJARAT AND THE CASE FOR LIVE VITAL CERTIFICATION**

Author: Mehul Joshi
Editor-in-chief-INBAC BTB magazine

20 **ONE BUILDING, ONE TRUTH: DESIGNING AN IBMS AROUND THE END USER**

Author: Mustkim A Saiyad
Designation: Director
Organization: Prime Core Associates

22 **FROM BUILDING MANAGEMENT TO BUILDING INTELLIGENCE**

Author: Udyan Dutta Gupta
Designation: Sales Leader
Organization: Honeywell Automation India Limited.

26 **BEYOND SMART CLAIMS**

Author: Sakhee Chandrayan
Designation: Founder & President & VITAL - India's first Smart Building Certification
Social Entrepreneur, Empowering Smart Collaborations
Organization: INBAC Association

The Editor's Desk

Dear Inbacers,

As we step into this vibrant festive season, the energy of Navratri brings a welcome sense of celebration and community.

At INBAC, that spirit of connection has been driving our recent initiatives. We've been actively reaching out across regions with impactful visits to hubs like Ahmedabad and Odisha to host interactive sessions with industry experts and welcome new members into our growing network. Building these ground-level bridges is vital as we work together toward a more connected, standardized future for intelligent buildings.

Looking ahead, the momentum continues with ORGATEC 2026 coming up. It promises to be a fantastic platform for exploring smart building technology, modern workplace design, and global industry trends. Beyond modern workplace design and flexible environments, the event strongly highlights the role of Indoor Air Quality (IAQ) as a central driving force for healthy, efficient, and high-performance office spaces.

A heartfelt thank you to the contributors of this edition for sharing their practical, real-world insights on system integration and standardization. Your honest perspectives drive our industry forward. We encourage more of our readers to step up, share your stories, and contribute to upcoming issues of BTB Magazine through INBAC.

Wishing you all a joyful Navratri season!

Sincerely,
Mehul Joshi
Editor-In-Chief
Building Technology BizBits Magazine.

THE AIR WE FORGET TO DESIGN

Why indoor air quality deserves a seat at the IBMS table

Walk into any new commercial building in India and you will see the usual things: a grand lobby, glass facade, polished flooring, and a control room with a big screen showing chillers, pumps and lifts. Everything looks smart. But ask the facility manager one simple question: "What is the CO2 level on the 9th floor right now?" Most of the time, you will get a pause.

We design buildings to be cool, safe and efficient. We rarely design them to be healthy to breathe in. I believe this is one of the biggest blind spots in our industry today.

Why this matters more than we think

People spend close to 90 percent of their time indoors. In a metro city like Ahmedabad, Delhi or Mumbai, an office worker may spend ten hours a day inside one building. The air in that building decides how they feel, how well they think, and how often they fall sick.

The proof is not just theory. Few international studies tested office workers in controlled rooms. When the same people worked in spaces with better ventilation and lower CO2, their decision-making and problem-solving scores went up sharply. Nothing else changed: same people, same tasks, same desks. Only the air.

Then came COVID-19, and the lesson became painful. A choir practice in Washington State in March 2020 is now a famous case. More than 50 of the 61 members got infected after one rehearsal in a closed hall. Good ventilation and air movement were missing. That one event pushed engineers across the world to look at air in a new way, and bodies like ASHRAE later brought out guidance on controlling infectious aerosols in buildings.

So indoor air quality (IAQ) is not a luxury or a green-rating checkbox. It is health, productivity and, increasingly, a tenant demand.

What bad IAQ looks like in real buildings

Let me share a few situations that I have seen, in one form or another, again and again.

The sleepy meeting room. A 12-seater conference room is designed for a certain amount of fresh air. In the actual meeting, 14 people sit inside with the door shut for two hours. CO2 climbs past 1,500 ppm. People get headaches, lose focus, and someone complains that "the AC is not working." The AC is working fine. The air is simply stale, and nobody is measuring it.

The tower that breathes in pollution. In winter, cities like Delhi see outdoor PM2.5 many times higher than safe limits. A building brings in fresh air to meet code, but its filters are basic. So the "fresh air" carries fine dust straight into the offices. Meanwhile, the filters themselves are changed by the calendar, not by how clogged they are

The basement parking that smells. Cars idle, ramps are crowded, and exhaust fans run on a timer. Carbon monoxide builds up in corners where there is no sensor. The fan is "working", but it is not responding to the actual air.

The newly fitted-out floor. A tenant finishes interiors with fresh paint, adhesives, new carpets and engineered wood. For weeks, VOCs (volatile organic compounds) off-gas into a sealed space. Occupants get irritation and a strange chemical smell. Nobody has a baseline reading to compare, so nobody knows how bad it is or when it improves.

The hospital that depends on pressure. In operation theatres and isolation rooms, air quality is also about direction of flow. If the pressure difference between rooms drifts because a filter is choking or a door is left open, clean air stops being clean. In many projects I have reviewed, the pressure sensors exist on paper but are not trended, alarmed, or even calibrated.

None of these buildings was "badly designed" by usual standards. They met the code. That is exactly the problem.

What is missing in most current project designs

When I review designs and BMS specifications, the same gaps keep showing up.

1. Design stops at air quantity, not air quality. We calculate fresh air in CFM per person and per area, which is necessary. But we assume that if the quantity is delivered, the quality is automatically fine. Nobody checks it after handover.

2. Very few sensors, in the wrong places. A single CO2 sensor in the return air duct tells you the average for a whole floor, not what is happening in a crowded meeting room. Many specs also ignore PM2.5, VOC and humidity completely.

3. No outdoor air reference. If you do not measure outside air, you cannot decide how much of it is safe to bring in. On a heavily polluted day, more fresh air can actually make indoor air worse.

4. Fixed fresh air, no demand control. Dampers are set at commissioning and forgotten. The building gives the same fresh air to an empty floor at 8 PM and a packed floor at 11 AM. This wastes energy in one case and starves people of air in the other.

5. Filtration chosen only on price. Filters are specified at the lowest grade that passes the tender. There is no differential pressure monitoring, so no one knows when a filter has failed or clogged.

6. Silos between systems. HVAC, BMS, fire alarm, access control and lighting all collect useful data, but they rarely talk to each other. Occupancy information from access control or lighting could tell the HVAC how many people are really there. Today, that value is thrown away.

7. No ownership and no targets. Ask who in the building is responsible for IAQ, and you will often hear silence. There is no target value, no alarm limit, no monthly report.

8. Nothing after handover. Sensors drift over time. Without a calibration plan, the data slowly becomes useless, and then people stop trusting the dashboard altogether.

What should be the must-have IAQ system

The good news is that none of this needs exotic technology. It needs good planning and a bit of discipline. Here is what I consider the minimum for any serious commercial, institutional or healthcare building.

Sensing at the right places

- CO2, temperature, and humidity sensors in every meeting room, large open-office zone, classroom, auditorium, and similar crowded space.
- PM2.5 and PM10 monitoring in key zones, plus one outdoor air-quality station on the roof or intake side.
- TVOC sensors in new fit-out areas, labs, and printing or pantry zones.
- Carbon monoxide sensors in basements and parking levels.
- Differential pressure sensors across filters and, in healthcare, across critical rooms.

Demand-based ventilation

Fresh air dampers, VAV boxes, and AHU fans should respond to real CO2 and occupancy, not a fixed setting. A simple, widely used target is to keep indoor CO2 below roughly 1,000 ppm. When it rises, more fresh air comes in. When the room is empty, the system backs off and saves energy.

Smart use of outdoor air

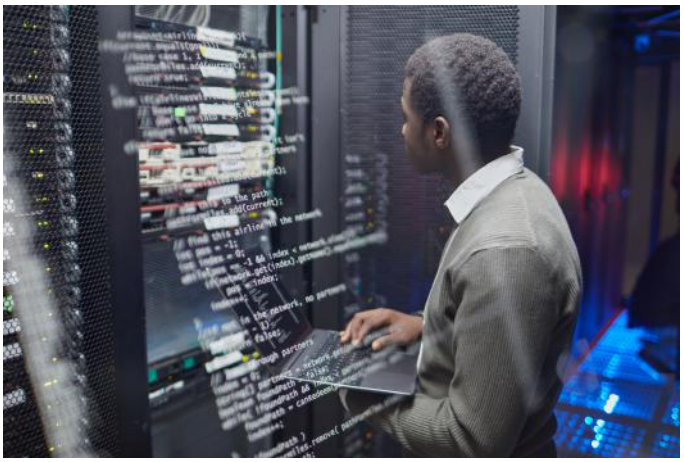
The BMS should compare outdoor and indoor readings. If outdoor PM2.5 is very high, the system can reduce intake, run higher-grade filtration, or recirculate through good filters for a short period. If outdoor air is clean, it can flush the building freely.

Proper filtration with monitoring

Use a better filter grade where outdoor pollution is high, and fit differential pressure sensors so that the BMS can raise a "change filter" alert based on actual condition. This also helps the maintenance team move from calendar-based to condition-based work.

Humidity control

Keeping relative humidity roughly between 40 and 60 percent reduces mould growth and keeps people comfortable. Many projects control temperature carefully and leave humidity to chance.



Alarms, trends and reports
Set clear limits, send alerts to the right person, and generate a simple monthly IAQ report for management. What is measured and reported gets managed. What is hidden gets ignored.

Calibration and commissioning
Include sensor calibration in the O&M contract, ideally once or twice a year. At handover, record a baseline IAQ reading for every zone. This single step helps settle future arguments between the tenant, the owner, and the contractor.

A simple example of how it works

Imagine a 10-storey office building. On a Monday morning, a floor fills up with 300 people. CO2 on that floor starts rising, from about 600 ppm to 900 ppm in the first hour. The IBMS notices the trend and opens the fresh-air damper in steps. At the same time, it checks outdoor PM2.5. The reading is moderate, so intake continues normally. By afternoon, half the staff leave for a client event. CO2 falls, and the system reduces fresh air to save energy.

A week later, the pressure drop across a filter bank crosses its limit. The IBMS sends an alert to the maintenance supervisor to change that set before the next air-quality dip. No one had to guess, and no one had to wait for a complaint.
This is not science fiction. Most of the hardware already exists in our projects. What is missing is the intent to connect it and the specification that demands it.

What owners, designers, and consultants should do

- Owners: Ask for IAQ as a performance requirement, not an optional extra. Name someone responsible for it.
- Consultants and designers: Write IAQ monitoring and demand-based control clearly into the BMS and IBMS specifications. Define sensor locations, accuracy, alarm limits, and reporting.
- Contractors: Commission the system honestly, with proper calibration records and a baseline report.
- Facility teams: Review the IAQ dashboard regularly, and treat a rising CO2 trend like you would treat a rising chiller temperature.
-

Final thought

We have become very good at making buildings efficient. The next step is making them healthy. Clean air does not show up in the architect's render or the lobby photograph, but people feel it every single hour they spend inside.

If a building can tell you its energy use to the last unit, it should be able to tell you the quality of the air its people are breathing. That is what a truly intelligent building should do, and the tools to do it are already in our hands.

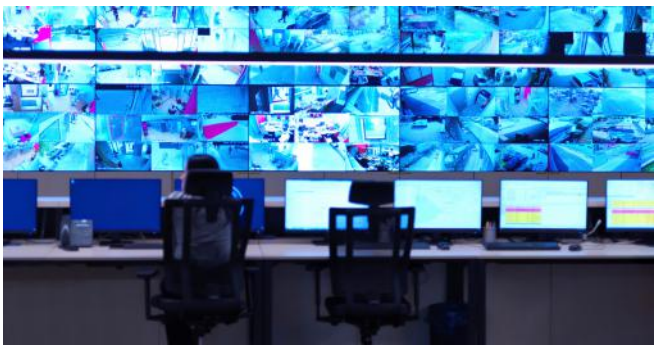
AUTHOR: KINJAL SHAH
DESIGNATION: DIRECTOR
ORGANIZATION: FIRE PROJECTS PVT. LTD.

SPEAKING THE SAME LANGUAGE: WHY INTEROPERABILITY AND STANDARDIZATION MATTER IN IBMS.

A few years ago, I visited a large commercial building where the facility manager proudly showed me his control room. There were five screens on his desk. One was for air conditioning, one for fire alarm, one for access control, one for CCTV, and one for lighting. Each had its own software, its own login, and its own vendor to call when something went wrong.
I asked him a simple question: "What happens when the fire alarm goes off?"
He smiled and said, "I look at all five screens and try to figure it out."
That one line explains why interoperability and standardization are not technical buzzwords. They are about whether a building can think as one system, or whether people have to do the thinking for it.

What is an IBMS, really?

An Integrated Building Management System (IBMS) brings the different systems of a building together on one platform. HVAC, electrical, fire detection, access control, CCTV, lift management, lighting, water, and energy metering can all be seen, monitored, and controlled from a single place.
The key word is integrated. Having many systems in one building is easy. Having them work together is the hard part. And that is where interoperability comes in.



What do we mean by interoperability?

In simple words, interoperability means that systems made by different manufacturers can talk to each other, understand each other, and work together without heavy custom effort.
Think of a mobile phone charger. If every phone company used a different plug, you would carry a bag full of chargers when you travel. Once the world agreed on common standards, life became easier. Buildings are no different. When a chiller, a fire panel, and an access controller all "speak" a common language, the building becomes smarter and the people running it become calmer.

And what is standardization?

Standardization is the agreement that makes interoperability possible. It means that the industry, the designers, the manufacturers, and the clients agree on common protocols, common ways of naming things, and common ways of documenting and testing.

Some of the well-known open protocols used in buildings today are:

- **BACnet –** widely used for HVAC and building automation, and recognized internationally as a standard.
- **Modbus** – simple and popular, especially for energy meters, VFDs, and packaged equipment.
- **KNX –** common in lighting and room-level control.
- **LonWorks** – found in many older installations.
- **OPC UA –** a secure and modern way to exchange data between systems, including IT and OT platforms.
- **MQTT and REST APIs** – lightweight ways of sending data to cloud platforms and analytics tools.

None of these is "the best" for everything. The real point is that each one is open, which means any vendor can implement it, and any client can benefit from it.

The problem with closed systems

Many of us in the industry have lived through the era of closed, proprietary systems. They worked well on day one. The trouble came later.

- The client was locked to one vendor for every expansion, every upgrade, and every spare part.
- Adding a new system meant paying for expensive custom "gateways" and special engineering.
- When the original vendor changed, shut down, or simply lost interest, the building was left stranded.
- Data was trapped inside each system, so nobody could see the full picture.

I have seen projects where the integration cost was higher than the cost of the system being integrated. That is not a technology problem. It is a planning problem, and it starts with the specification.

Why this matters more today

Buildings in India are changing fast. We are building bigger, taller and more complex facilities such as hospitals, airports, data centres, metro stations, ultra highrise towers, and large townships. At the same time, clients are asking sharper questions.

- Can I see my total energy use in one place?
- Can my fire system, access control and lifts work together during an emergency?
- Can I add a new system in five years without throwing away what I have?
- Can my building data go to a dashboard that my management team can actually use?

If the systems are not interoperable, the answer to all four is "yes, but it will cost you." If they are, the answer is simply "yes."
There is also the matter of energy and sustainability. Green building ratings, ECBC compliance and corporate ESG goals all depend on reliable data. You cannot reduce what you cannot measure, and you cannot measure properly if your systems cannot share information.

What good interoperability looks like on site

When interoperability is done well, the benefits are very practical.

One view of the building: The operator sees alarms, trends and status from every system on a single platform. No more running between five screens.

Smarter responses: When a fire alarm is raised, the IBMS can unlock designated doors, bring lifts to the ground floor, shut down air handling units, switch on emergency lighting and show the nearest camera feed, all together and in the right order.

Lower running cost: Data from HVAC, lighting and metering can be combined to find waste. A floor that is cooled all night with nobody inside is easy to catch when the systems share information.

Freedom for the client: Because open protocols are used, the owner can choose the best vendor for each future need, instead of being tied to one forever.

Easier maintenance. Common standards mean common skills. Technicians do not need to learn a new language for every building.

The part people forget: standardization is more than protocols

When we say standardization, most people think only about communication protocols. But a building also needs agreement on a few quieter things, and these often decide whether a project succeeds.

Naming and tagging: If one system calls a point "AHU-1 SAT" and another calls it "Supply Air Temp Unit 1", a human can understand both, but software cannot. Common naming conventions and data-tagging models make analytics and dashboards much easier to build.

Documentation: A clear points list, an interface matrix and a network architecture drawing should be part of every project. Everyone should know what talks to what, over which protocol, and who is responsible for each connection.

Testing and commissioning: Integration should be tested before handover, not discovered during the first emergency. A clear integrated-systems test, with witnessed results, is the best protection a client can have.

Cybersecurity: The moment systems are connected, they must also be protected. Standards such as IEC 62443, along with sensible practices like network segmentation, role-based access and regular patching, are now a basic part of any serious IBMS design. Interoperability without security is an open door.

Where projects go wrong

In my experience, integration problems rarely come from the technology itself. They come from a few repeated habits.

1. **The IBMS is treated as an afterthought:** The HVAC, fire and security packages are tendered separately, and someone is expected to "integrate" them later.
2. **Specifications are vague:** A line saying "the system shall be BACnet compatible" can mean almost anything. Which BACnet profile? Which objects? Who provides the points and who pays for the gateway?
3. **Nobody owns the interface:** Each contractor finishes their own scope, and the gaps between scopes belong to no one.
4. **Integration is tested too late:** By then the walls are painted and the budget is spent.

None of these is difficult to fix. They only need attention at the right time, which is the design stage.

A few simple suggestions

For consultants, project owners and contractors planning an IBMS, here are some things that have worked well in the projects I have seen.

- **Decide the integration approach early:** Bring the IBMS discussion into the design stage, not the execution stage.
- **Insist on open protocols:** Write clearly in the specification which protocols are required at which level, and ask vendors for protocol implementation statements and certifications.
- **Prepare an interface matrix:** List every system, every interface, the protocol, the points to be shared and the responsible party.
- **Define one integrator with clear responsibility:** Somebody must be accountable for the whole, not just the parts.
- **Plan for the future:** Leave room in the architecture for new systems, new buildings and new technologies.
- **Build cybersecurity in from day one:** Do not add it later as a patch.
- **Test integrated scenarios:** Do not just check that the points are visible. Check that the fire scenario, the power failure scenario and the access scenario actually work as designed.

Looking ahead

The next few years will bring even more connection to our buildings. Cloud platforms, artificial intelligence, digital twins, smart metering and IoT sensors are all becoming part of the picture. Every one of them depends on one simple thing: clean, open and well-organised data.

Buildings that are built on open standards will be ready for these changes. Buildings built on closed, isolated systems will find every new step expensive and slow.

That is why I believe interoperability is not a feature to be added to an IBMS. It is the foundation of an IBMS. Without it, we only have a collection of systems that happen to share a building.

In conclusion

Go back to the facility manager with five screens on his desk. He was good at his job. His problem was not skill. His problem was that his building had never been designed to speak with one voice.

Interoperability and standardization are about giving buildings that voice. They help the operator, protect the investment of the owner, and prepare the building for tomorrow. They ask for no magic, only good planning, clear specifications and a little cooperation between the people who design, supply and install our systems.

If we do that, the next time an alarm goes off, no one will need to look at five screens. They will only need to look at one, and the building will already be telling them what to do.

AUTHOR: VINAYAK MISHRA
DESIGNATION: IBMS SALES EXPERT

BEYOND COMMISSIONING: BUILDING AN IBMS THAT DELIVERS, AND KEEPS DELIVERING

Every Integrated Building Management System (IBMS) looks impressive on the day of handover. The graphics are live, the dashboards are green, and the client's management team sees the entire building on one screen. The real test comes twelve months later. Are the alarms still meaningful? Are the chillers still running on optimised sequences? Is the energy data still trusted? Does the facility team still open the system every day, or has it quietly become an expensive display?

In my years of working with building systems, I have seen both outcomes. The difference is rarely the brand of controller or the size of the software licence. It is decided much earlier, in how the project was bid, how it was engineered, and how seriously the system was prepared for life after commissioning. This article shares the key aspects that, in my experience, separate an IBMS that delivers lasting value from one that fades after a few months.

Getting It Right at the Bidding Stage

Most IBMS problems are born in the tender. A vague scope and a lowest-price award almost guarantee a compromised outcome.

1. Start with the owner's intent, not the equipment list

Before counting points, ask what the building owner actually wants from the system. Lower energy bills? Faster fault response? Compliance reporting for a green rating? Centralised control of multiple towers? A clear statement of objectives lets every bidder price the same outcome rather than the same list of boxes. Where the tender document does not state them, a good bidder should ask, and a good consultant should clarify in writing.

2. Define scope and integration boundaries precisely

The single biggest source of disputes is the integration boundary. The bid should clearly state:

- Which systems are controlled by the IBMS (HVAC, chillers, AHUs, pumps, DG sets, lighting) and which are only monitored.
- Which systems are integrated (fire alarm, access control, CCTV, lift, energy meters, UPS, water management) and at what level: hardwired, Modbus, BACnet, OPC, or API.
- Who provides the gateways, protocol documents, and integration support from the third-party vendor.
- A complete point list or an integration matrix, with a rule for how variations in point counts will be treated.

If the fire alarm vendor, the chiller OEM, or the meter supplier is not obliged to provide an open protocol and support during integration, the IBMS contractor is carrying a risk that nobody has priced.

3. Insist on open protocols and a vendor-neutral architecture

A system locked to one manufacturer's proprietary language becomes a dependency for the next fifteen years. Specify BACnet, Modbus, and OPC as appropriate, and require that controllers and field devices can be serviced, expanded, or replaced without being tied to a single supplier. Open architecture does not mean lower quality. It means the owner keeps the freedom to maintain and grow the system.

4. Design the architecture for reliability
The tender should address server redundancy, network topology, controller autonomy, power backup for the head-end, and data backup. A well-designed IBMS keeps the building running even if the supervisory layer goes offline: field controllers must continue to run their control logic independently. Ask every bidder how the system behaves during a network failure, a server crash, or a power cut.

5. Evaluate bids on lifecycle cost and capability, not just the price
A low bid that excludes engineering hours, testing, training, documentation, and a support period is not low; it is incomplete. When comparing bids, check:

- The quality and make of field devices: sensors, actuators, valves, and meters.
- The depth of the engineering team, and whether integration experience is demonstrated by completed projects.
- Software licensing terms: point limits, client licences, upgrade costs, and renewal fees.
- The inclusion of the testing, commissioning, training, and documentation scope.
- The defect liability period and the post-handover support offered.

A price difference of a few percent at the bid stage can become a multiple of that amount in rework and lost performance later.

Implementing the IBMS for Performance

1. Engineer before you install
Good implementation starts on paper. Detailed design should produce the system architecture, control panel drawings, I/O schedules, network layouts, and, most importantly, a Sequence of Operations (SOO) for each system. The SOO is the heart of the project. It defines how a chiller plant stages, how an AHU responds to a CO_2 or temperature signal, and how pumps rotate on fault. When the SOO is vague, the programmer decides, and the result seldom matches the designer's or the owner's intent. Get the SOO reviewed and approved by the consultant, the MEP contractor, and the facility team before programming begins.

2. Coordinate with the MEP and other trades
An IBMS depends on what is installed in the field. Valves must be correctly sized and have the right characteristics. Sensors must be located where they can measure something meaningful. Flow meters, BTU meters, and energy meters must be installed with proper straight lengths. Starters and VFDs must have the right control interface and a ready status. Early coordination meetings between the IBMS team and the HVAC, electrical, plumbing, and fire contractors prevent expensive site rework.

3. Take field installation quality seriously
Bad installation shows up as bad data. Poor cabling practice, loose terminations, unshielded signal cables run beside power cables, improper grounding, and sensors placed in dead zones all produce unreliable readings. Once operators stop trusting the data, they stop using the system. Insist on labelling, cable tagging, loop checks, and documented termination tests.

4. Test in stages: FAT, SAT, and integrated testing
Panels and software should go through a Factory Acceptance Test before dispatch. On site, every point must be verified from the field device to the graphic, covering the correct scaling, units, alarm limits, and command action. Then comes integrated systems testing, which is where most IBMS projects reveal their weaknesses: fire alarm interface behaviour, DG changeover, power failure and restart, and cause-and-effect scenarios across systems. Do not compress this phase to meet a handover date.

5. Commission against performance, not just against communication
A point that is visible is not a point that is working. True commissioning means proving that the controlled system achieves its setpoints, that control loops are tuned and stable, that staging and rotation work, and that fail-safe behaviours operate as designed. Where possible, commissioning should be witnessed and signed off by the consultant and the owner's representative with a recorded checklist.

6. Design usable graphics, alarms, and reports
An operator's screen should tell a story quickly. Clean graphics, a logical navigation, and a meaningful alarm hierarchy make the difference between an operator who responds and one who ignores. Poor alarm design, with hundreds of nuisance alarms, creates alarm fatigue and hides real faults. Prioritise alarms, set sensible limits and delays, and give each alarm a clear description and expected action. Reports for energy, runtime, and fault history should be built for the people who will actually use them: the facility manager, the energy manager, and the management.

7. Build cybersecurity in from day one
An IBMS is a networked system, and it is a target. Isolate the building network from the corporate network, change default passwords, define user roles and access levels, disable unused ports and services, and plan for secure remote access. Security is not an optional extra to be added after an incident; it should be a line in the specification and a line in the test plan.

Making the System Last

The point that matters most to a building owner is also the one most neglected: the system must still perform in the second, fifth, and tenth year.

1. Train the people who will run it
A system handed over to an untrained team will be bypassed within months. Training should be role-based: operators learn daily use and alarm response, technicians learn troubleshooting and calibration, and managers learn how to read the performance reports. Repeat the training after the first operating season, when real questions emerge, and record it so it survives staff turnover.

2. Hand over complete documentation
As-built drawings, the final I/O list, network and IP schedules, SOO documents, graphics and database backups, controller programs, passwords under a controlled procedure, calibration certificates, and O&M manuals all belong in the handover package. If only the original engineer understands the system, the owner is permanently dependent on one person. Good documentation protects the owner's investment.

3. Plan the O&M and support structure before handover
An IBMS is not a one-time delivery. Agree an annual maintenance contract with a defined scope, response times, and escalation. It should cover preventive maintenance, sensor calibration, software backup, and regular health checks of servers, controllers, and networks. Keep a stock of critical spares such as controllers, power supplies, and key sensors, so that a failed component does not leave a plant running in manual mode for weeks.

4. Keep tuning and recommissioning
Buildings change. Occupancy patterns shift, tenants fit out new areas, equipment is replaced, and seasons alter the load. A control sequence that was ideal at handover may be wasteful two years later. Schedule periodic reviews, ideally every six to twelve months, to retune loops, revise schedules and setpoints, and check that overrides and manual bypasses applied during breakdowns have been restored to automatic. Many sites quietly lose a large share of their potential savings simply because overrides stay in place forever.

5. Use the data
The IBMS records an enormous amount of operating information. Review it against energy baselines, equipment runtime, comfort complaints, and fault trends. Trending data can reveal a failing sensor, a leaking valve, or a chiller working harder than it should long before a breakdown. A system whose data is never looked at is only a very costly alarm panel.

6. Manage software, patches, and obsolescence
Operating systems age, licences expire, and hardware reaches end of life. A support plan should include software updates, security patches, regular backups with restoration tests, and a roadmap for the replacement of obsolete components. Open protocols make this far easier and cheaper.

Why Do Systems Fail After a Few Months?
Looking across projects, the same causes appear again and again:

- A vague scope and a price-driven award that left no budget for engineering and testing.
- Integration promised on paper without the third-party vendor's commitment.
- No approved sequence of operations, so the control logic never matched the plant's needs.
- Sensors and actuators that were poorly selected, poorly installed, or never calibrated.
- Nuisance alarms that trained operators to ignore the system.
- Manual overrides that were never returned to auto.
- No trained team, incomplete documentation, and no maintenance contract.
- Nobody was accountable for performance after the handover date.

Every one of these is preventable, and every one is cheaper to prevent than to fix.

A Short Checklist for Owners, Consultants, and Contractors

1. Is the owner's objective written down, and does the scope serve it?
2. Are the integration boundaries, protocols, and responsibilities clearly assigned?
3. Is the architecture open, redundant, and able to run locally if the head-end fails?
4. Are bids compared on scope completeness and lifecycle cost, not just on price?
5. Has the Sequence of Operations been approved before programming?
6. Have field devices been selected, installed, and tested to a documented standard?
7. Has the system been commissioned for performance and integrated behaviour, not just for communication?
8. Are alarms prioritised and cybersecurity addressed?
9. Are the operators trained and the documentation complete?
10. Is there a funded O&M plan, a spares plan, and a schedule for periodic recommissioning?

Conclusion

An IBMS is one of the most powerful tools a building owner can have. It can lower energy consumption, shorten response times, improve comfort, and give management a clear view of the asset. But it delivers on that promise only when it is treated as a long-term operating system and not as a short-term installation. Clear scope at the bid stage, disciplined engineering and testing during implementation, and sustained attention after handover are what turn an IBMS from a showpiece into a dependable partner for the life of the building.

At the end of the day, the best measure of an IBMS project is not how it looks at the inauguration. It is how well it is still working when the building's second summer arrives.

AUTHOR: BHARAT YADAV
DESIGNATION: DIRECTOR
ORGANIZATION: TECHNIK INFINITE SOLUTIONS PVT. LTD.

ORGATEC INDIA
INBAC Building Connectivity
JWCC, MUMBAI
NOV 19-21, 2026
BAC E&C
BUILDING AUTOMATION COMMUNITY EXPO & CONNECT-CONVENTION

6TH EDITION
BAC E&C 2026
BUILDING AUTOMATION COMMUNITY EXPO & CONNECT-CONVENTION

19 - 21 NOVEMBER 2026

VENUE

Jio World Convention Center (JWCC) BKC
Bandra East Mumbai, INDIA

ORGATEC INDIA

INDIA'S ONLY EXHIBITION REDEFINING THE FUTURE OF WORKSPACES

19-20-21 NOV 2026

JIO WORLD CONVENTION CENTRE, MUMBAI

2025 Highlights

9,417	101	18	10,000	100
Visitors	Exhibitors	Country Representations	sqm Exhibition Space	Speakers & Thought Leaders

Join us in shaping the future of workspaces. Get in touch:

For Sales & Sponsorship
Manoj Nandiot
M: +91 98339 31376
E: m.nandiot@koelnmesse-india.com

For Marketing & Alliances
Akshata Ayare
M: +91 80971 26313
a.ayare@koelnmesse-india.com

Stay Connected:

www.orgatec-india.com

koelnmesse

CAN YOUR BUILDING KEEP UP WITH THE AIR OUTSIDE?

At almost every project handover, someone asks me the same question. The screens are green, the paperwork is signed, and the client says, “So now the building will look after itself?”

I wish I could say yes. The honest answer is : only for a while !
A building is not like a machine that runs the same way every day. The weather outside keeps changing. The number of people inside keeps changing. Even the equipment slowly changes as it ages. A Building Management System (BMS) that was set up perfectly on day one will be a little out of tune by the next monsoon.

In this article, I want to talk about that gap. It is the gap between the world a BMS was designed for and the world it actually works in. The best way to see this gap is to look at something simple: the air people breathe inside the building.

The air outside is not what it used to be

For many years, ventilation design followed one easy idea. Bring in a fixed amount of fresh air from outside. This will dilute whatever pollution is inside. The room stays healthy.

This idea assumed that outside air is clean. Today, in many Indian cities, that is not always true.

Think of Delhi in winter. Think of an evening in Ahmedabad when dust and traffic smoke hang over the road. On such days, the fresh air we bring in can be dirtier than the air already inside. The cure becomes the cause.

The World Health Organization made its guideline stricter in 2021. It now says the yearly average of fine dust (PM2.5) should stay near 5 micrograms per cubic metre. Many of our cities stay well above even our own national limit for long stretches of the year.

So the question for the BMS has changed. It used to be, “How much fresh air do we need?” Now it is, “How much outside air can we safely take in right now, and what must we do to it before it reaches people?”

These are two very different problems. A control program written for the first one will quietly fail at the second.

We should also remember how much time people spend indoors. A commonly quoted figure is about 90 percent of the day. Office, home, hospital, classroom. When we talk about air quality inside buildings, we are talking about where most of our exposure actually happens.

Where things usually go wrong

The failures I see most often are not dramatic. They are ordinary, and that is why they last so long.

The CO2 sensor is in the wrong place. Many buildings do have CO2 sensors, but they sit in the return air duct. That duct carries the average air of a whole floor. It does not tell you about a small meeting room where eight people have been sitting with the door closed. By the time the average rises, the room has been stuffy for an hour. People are tired and unfocused, and nobody knows why.

Humidity is ignored. In our climate, especially near the coast and during the monsoon, moisture is the real problem. A system can hold a perfect temperature while the room sits at 70 percent humidity. That is not comfort. That is just a good-looking number. Mould does not care about the temperature graph. Keeping the room between about 40 and 60 percent humidity matters more than saving half a degree.

Sensors go wrong quietly. Sensors drift as they age. Some simply die. Picture a CO2 sensor that shows exactly the same reading for weeks in a busy room. A room full of people can never be that steady. The sensor is stuck, but the control system keeps trusting it and keeps making decisions on bad information.

Filters are chosen once and forgotten. At design stage, we pick a filter based on typical outdoor conditions. When the outdoor air gets worse, the filters clog faster than planned. Without a simple pressure reading across the filter and an alert, nobody knows. Either the airflow drops, or the dirty air finds a way around the filter. In both cases, the air reaching the room is not the air we designed.

Look at these four problems together. None of them is a failure of technology. In each one, the system was told to follow a fixed script, and the real world stopped following that script.

What I mean by a building that responds

Every BMS responds to its surroundings in some way. The real question is whether it responds wisely or blindly.

A wise system notices change. Outdoor dust goes up, and it knows. A meeting starts early and the room fills up, and it knows. The chiller is running at a load it was not tuned for, and it knows that too.

A blind system gets disturbed by the same changes. It cannot adjust. So it swings up and down, wastes energy, and annoys everyone. Finally, a tired operator switches it to manual mode.

Manual mode is where good control design goes to die. It is meant to be a short fix for one afternoon. Then it stays that way for a year. If we want buildings to work well, we must build systems that operators trust enough to leave on automatic.

What a smarter BMS can do

None of the ideas below is new or complicated. Most of them are about closing loops that we used to leave open.

First, let the BMS watch the outside air. A small outdoor station on the roof can measure PM2.5, PM10, temperature and humidity. This gives the system a simple but powerful ability: it can see what it is about to breathe in.

With that, it can act sensibly. When outdoor dust rises, it can cut fresh air down to the minimum allowed, send more air through better filters inside the building, and keep the building at slightly higher pressure so that dusty air does not leak in through doors and shafts. When the haze clears, it goes back to normal by itself. Nobody has to run to the control room.

Second, ventilate according to people, not just a fixed number. This is called demand-controlled ventilation. The system measures CO2 and occupancy in each zone, and gives more air where people are, and less where they are not. This idea is already in the standards. Yet I still see projects where it was installed and then switched off, because the dampers were moving up and down without settling. That is a tuning problem, not a problem with the idea. With patience, it can be fixed.

There is an honest conflict here. Saving energy means bringing in less air. Controlling pollution means being careful about what comes in. Neither goal is wrong. The BMS is the one place where the two can be balanced, minute by minute, using real data instead of a thumb rule. To me, this is the most valuable thing a modern BMS can do for an owner.

Third, treat humidity as a main target. Control the cooling coil using dew point. Let the system decide when outside air is truly helpful, and when it only adds moisture. The aim is simple. The room should feel dry and comfortable, and the temperature will then follow.

Sensors you can trust

I said that sensors drift. Let me also say what to do about it.
Place sensors with care. A few sensors in the right spots are better than many in the wrong ones. Keep them in the breathing zone, away from supply air and doors.

Add simple common-sense checks to the program. If a CO2 reading never changes through a full working day, raise an alarm. If two neighbouring rooms that usually move together suddenly split apart, raise an alarm. A good controls engineer can write these rules in an afternoon. Yet most sites I visit do not have them.

And put calibration in the maintenance plan, with a name and a date next to it. In hospitals and cleanrooms this is normal. In ordinary buildings it is rare. I believe tenants and green rating bodies will soon start asking for it.

Commissioning is not a one-day job

A good design can still fail on site if the commissioning is rushed. And commissioning is usually the first thing to be squeezed when a project is running late.
My suggestion is to commission a BMS twice. The first time is at handover, as usual. This proves the system does what it was told to do.

The second time is after one full year, once every season has passed. By then we know how the building is really used. We know how fast the filters get dirty. We know what the operators think. Now we can ask a better question: is what we told the system still the right thing to tell it?

Retuning at this stage almost always pays for itself in energy savings, before we even count the benefit to people.

One more habit helps a lot. A BMS records huge amounts of data, and most of it is never looked at. Spend half an hour each month on a few useful graphs. Look at CO2 against occupancy. Look at humidity against outside weather. Look at the pressure across the filters over time. You will learn more from these than from many audit reports.

Keep it open, and keep it safe

If buildings must keep adapting, the BMS must be able to grow without being thrown away. This is why open protocols such as BACnet and Modbus matter. They let an owner add a new air quality sensor or a new meter without asking the original supplier for special permission, or paying a heavy price.

I have seen owners stuck with a closed system that could not accept one new type of sensor without an expensive visit from the vendor. Air sensing is improving every couple of years. That is a bad place to be. So my advice is to ask one question early: how will this system accept something that does not exist yet?

Connected systems also bring risk. A BMS that talks to the cloud, a tenant app and a contractor's laptop has more doors that can be opened. Keep the networks separate, control who can change what, and plan this at design stage. A smart building that anyone can tamper with is not an improvement.

Why this matters for people

For many years, we sold the BMS on savings. Lower electricity bills. Lower peak charges. A quick payback. All of that is still true.

But today, the stronger reason is people. Research has linked indoor air quality to how well people think, how often they fall sick, and how they breathe. I would not oversell any single study. Still, anyone who has sat in a stuffy conference room at four in the afternoon does not need convincing. Air affects the mind.

Tenants have started asking for air quality data before they sign a lease. Hospitals and schools have a duty to protect the people in their care. Even home buyers now ask about air purification as readily as they ask about parking.

So the BMS is no longer just a back-room utility. It has become a kind of promise. The building is saying: the air you breathe here is watched, managed and recorded.

Five things I would tell a new project team

1. Decide what to measure, and why. Not every space needs every sensor. Choose by how the space will be used.
2. Design for the bad day. Write the control logic for the week when the outside air is poor and the building is full. Good days take care of themselves.
3. Let operators see the reasoning. A screen that only shows red or green is not enough. Show a message such as "Fresh air reduced because outdoor dust is high." People trust what they understand.
4. Budget for year two. Calibration, filter changes, retuning and training are part of the system, not extras.
5. Leave room to grow. We cannot predict how a building will be used, or what the next pollutant of concern will be. Keep space in the design, the protocols and the budget.

A last word

I began with that question at handover: will the building now look after itself?

My answer today is this. It will, if we give it the right eyes and the right habits, and if somebody is still paying attention a year later.

The technology is not the difficult part. A BMS that senses change, balances competing needs and explains its own decisions is possible on almost any project today. What is difficult is the mindset. Owners, consultants, contractors and operators must all treat the building as something alive that needs care, and not as something finished.

The air inside our buildings cannot be seen, and that is exactly why it gets ignored. I would like us to give it the same attention we give to power and water. If we do, the people inside will never think about the BMS at all. They will simply feel well. For a control system, that is the best compliment there is.

AUTHOR: NIMISH S PANDYA
DESIGNATION: DIRECTOR.
ORGANIZATION:INFERNO DISRUPTIVE CONTROLS.

WHERE CITIES THINK: LESSONS FROM GIFT CITY, GANDHINAGAR, GUJARAT AND THE CASE FOR LIVE VITAL CERTIFICATION

"A smart city is not a city with more technology. It is a city that knows its own condition at every moment and can prove it."

Editor's Introduction

For more than twenty years, I have worked on the engineering side of buildings: electrical systems, ELV and ICT, BMS and IBMS, fire and life safety, and the MEPF services that hold a building together. Over that time, I have seen one pattern repeat. Individual buildings have become dramatically smarter, while the cities around them have often remained a patchwork of disconnected systems.

That is why a recent INBAC visit to GIFT City, Gujarat's flagship smart city and India's first operational International Financial Services Centre, mattered so much to me. Walking through a city that was planned with its infrastructure underground, networked, and monitored from the start is a different experience from reading about it.

This article records what I and Mrs. Sakhee Chandrayan (Founder and President of the INBAC Association) witnessed during our visit to Indias most talked Smart City in mid september 2026., what we discussed with the GIFT City authorities, and what I believe it means for how Indian cities will be built over the next two decades.

It also makes an argument that I think our industry needs to take seriously. Smart infrastructure is only as good as our ability to verify that it keeps performing. That is where a live certification model such as VITAL can change the conversation, moving us from certifying a building once, on paper, to recognizing performance continuously, in real time.

1. The Visit: Who We Met and Why We Went

INBAC's mission is to bring together the people who design, integrate, operate and regulate intelligent buildings: consultants, system integrators, OEMs, facility managers and authorities. Our members repeatedly ask the same question: what does a genuinely integrated, city-scale smart infrastructure look like in practice, and how do we replicate it?

GIFT City is the closest working answer India currently has. So the INBAC delegation, together with colleagues from the consulting and integration community, visited the city to meet the GIFT City authorities, understand how the infrastructure is planned and operated, and open a conversation about how INBAC's knowledge platform and the BTB magazine can document these lessons for the wider industry.

The discussions were open and technical. We were not shown a brochure; we were shown a city, and we were able to ask the questions that engineers ask: how are the utilities coordinated, who owns the data, what happens during a failure, and how is performance measured after handover?

Image - from Left Dr. Nilesh Kumar Purey, Mrs. Sakhee Chandrayan, Mr. Mehul Joshi

In Conversation with the City's Planner and Technologist

The heart of our visit was an interaction with two people who shape how GIFT City is planned and run: Shri.Loveleen Garg, Chief Planner, GIFT City., and Dr. Nilesh Kumar Purey, Chief Technology Officer, GIFT City.

Loveleen Garg, Chief Planner. Loveleen Garg leads planning, architecture and environment at GIFT City, and has been closely involved in the master planning of India's first operational smart city and IFSC. His focus is on urban resilience and sustainable development.

Dr. Nilesh Kumar Purey, Chief Technology Officer. Dr. Purey leads the technology and ICT backbone of GIFT City, having been associated with the city's technological vision since its early years. He oversees the centralised platform to which the city's buildings are connected before they receive occupancy certificates.

That last point struck me as the most important idea of the visit. A city that makes digital connectivity a condition of occupancy is treating building data as part of its infrastructure, not an optional extra. It is precisely the foundation on which a live certification can be built.

Mr. Garg's planning perspective, on how the physical city is laid out to support density, walkability and shared services, and Dr. Purey's technology perspective, on how that city is monitored and operated, together gave our delegation a complete picture of a city designed to be read as well as built.

Image - from left Mr. Loveleen Garg, Mrs. Sakhee Chandrayan, Mr. Mehul Joshi

2. What Makes GIFT City Different

Most Indian cities grew first and were wired later. Every new service meant digging up a road that had only just been laid. GIFT City reverses this sequence. Its core principle is that **infrastructure comes first and is shared.**

Utilities planned underground

The city's common utility tunnel concept places power, water, telecom and other services in a shared, accessible corridor rather than burying each one separately beneath the road. For an engineer, the consequences are significant. Maintenance does not require excavation. New connections can be added without disturbing neighbours. Faults can be located and isolated far faster, and the roads above stay in use.

District cooling

Centralised district cooling replaces dozens of individual chiller plants with a shared, professionally operated cooling service. It removes plant rooms and cooling towers from individual buildings, frees up real estate, and allows efficiency to be optimised at a scale no single building can reach. For MEPF consultants it changes how we design: the building becomes a consumer of a utility rather than the owner of a plant.

Automated waste collection
Underground pneumatic waste handling takes refuse off the streets and out of the public eye. It improves hygiene, reduces vehicle movement and gives the city a measurable, data-rich waste stream.

Integrated command and control
Above all of this sits a command and control layer that brings together the city's operational data. This is the heart of a smart city. A tunnel, a chiller plant or a waste network is only a smart asset when its status is visible, its alarms are acted on, and its performance is recorded.

Reliable power, water and connectivity
The backbone services (dependable power, treated and recycled water, and high-capacity ICT and fibre) are treated as essential city infrastructure, not as afterthoughts for each plot owner.

3. A Consultant's View: Where Building Systems Meet City Systems

My own work with GIFT City developments has shown me both sides of this arrangement. When we review electrical designs for a plot against the city's electrical infrastructure requirements, coordinate BMS input/output schedules for a commercial tower, or prepare fire and life safety submissions for a high-rise, we are always working at an interface. The building must speak the city's language.

That interface is where most of the practical challenges sit:

- **Protocol and data standardisation.** If every building exposes its data differently, the city layer cannot use it. Standardised BMS and IBMS guidelines, open protocols and consistent point naming are not luxuries. They are what allow a city to understand its buildings.
- **Clear responsibility boundaries.** District services, common infrastructure and tenant systems each have owners. Contracts, scopes and commissioning responsibilities must say precisely where one ends and the next begins.
- **Fire and life safety coordination.** Compliance points such as travel distances, common paths of travel, dead-end corridors and refuge area access must be resolved at design stage and then verified during operation. Expert fire committee reviews of high-rise projects in GIFT City show how seriously this is taken.
- **Commissioning and handover.** The most expensive failures in smart buildings happen in the gap between installed and integrated. A system that has been installed but never fully commissioned is not smart; it is simply expensive.

The lesson for the industry is that **smart infrastructure is a system of systems,** and the quality of the whole depends on the discipline of every interface.

4. How Smart Infrastructure Is Shaping Modern Indian Cities

GIFT City is one example of a much larger movement. Across India, the Smart Cities Mission, metro and transit corridors, new airports, data centres, healthcare campuses, townships and industrial parks are all adopting a common set of ideas.

Integrated command centres are becoming standard. Cities now monitor traffic, water, waste, public safety and energy from unified operations rooms rather than through separate departments.

Buildings are becoming connected assets. IBMS platforms now integrate HVAC, electrical, fire alarm, lighting, access control, CCTV, water and energy metering into one operational picture. With AI-assisted analytics, they are beginning to predict faults, optimise energy and flag anomalies before occupants notice them.

Utilities are being consolidated and metered. District cooling, centralised water treatment and recycling, and sub-metered power allow resource use to be measured and managed rather than estimated.

Resilience is designed in. Redundant power, fire-safe cabling, segregated networks and tested emergency response are increasingly part of the brief, not an upgrade.

Sustainability is measurable. Energy, water, carbon and waste data are now available at the building and precinct level. For the first time, claims of sustainability can be backed by continuous evidence.

In my own project experience across townships, healthcare campuses, hospitality, industrial facilities and large corporate developments, I see the same trajectory. The clients who benefit most are those who treated the digital backbone as core infrastructure from day one.

Image: Visit to the utility tunnel / district cooling facility / command centre.

5. The Missing Piece: Verifying Performance Over Time

Here is the uncomfortable truth that every consultant and facility manager knows. Most certifications and approvals in our industry are point-in-time. A building is inspected, assessed and certified at handover, and the certificate then hangs on the wall for years while the building changes.

Chillers drift out of tune. Sensors fail silently. Fire systems are impaired and not restored. Control logic is overridden and never reset. Energy performance quietly degrades.

The paper certificate still says the building is compliant, sustainable and smart. Reality may have moved on.
This is a particularly serious gap for smart cities. A city that depends on thousands of connected assets cannot rely on a certificate issued years ago. It needs to know, now, whether those assets are healthy.

6. VITAL Certification: From a Static Certificate to a Living Record

This is where the idea of **VITAL certification** becomes compelling. The concept is simple, and it is a natural fit for kind of the infrastructure we saw at GIFT City.

Instead of treating certification as a one-time event, a live certification framework **continuously reads the condition of a building or precinct** from its own systems and reflects it as a visible, current status. The certificate stops being a document and becomes a living indicator.

What a live certification model offers

1. Continuous assurance. Performance of critical systems such as fire and life safety, power, HVAC, water, energy and ICT is verified on an ongoing basis rather than at one inspection.
2. Transparency. Owners, tenants, regulators and investors can see current status, not historical claims.
3. Early warning. A drop in performance becomes visible while it is still a maintenance task, not yet a failure.
4. Accountability. When status is visible, operators and service providers have a clear, shared record of what was delivered and when.
5. Credibility for sustainability. Energy, water and carbon claims are supported by actual operating data.
6. Lower risk. Insurers, lenders and occupants gain confidence from evidence rather than assertion.

7. Cities That Are More Resilient and More Sustainable

When a live certification layer is added to smart infrastructure, three things happen to a city.

It becomes more resilient. Problems are detected in hours, not months. Fire protection, emergency power and critical ICT are continuously verified, which matters most in high-rise, healthcare and mission-critical environments.

It becomes more sustainable. What is measured is managed. Continuous visibility of energy and water performance creates a standing incentive to keep buildings efficient, rather than letting them drift after the green rating is issued.

It becomes more investable. Global capital, which GIFT City is specifically designed to attract, looks for operational certainty. A city that can demonstrate the live health of its infrastructure speaks the language of institutional investors.

The reverse is also true. Cities that adopt smart technology without any live verification risk building very expensive, very opaque systems that no one can confidently vouch for.

8. What Needs to Happen Next

Turning this vision into practice will require coordinated effort from every part of our ecosystem.

- Consultants should design for data from the outset: defined points lists, open protocols, and clear interface responsibilities between building and city systems.
- System integrators and OEMs must commission fully, document honestly and deliver integration that works under real operating conditions.
- Developers and owners should treat the digital backbone as core infrastructure and budget for its operation, not just its installation.
- Authorities can set the framework: common standards, data-sharing expectations and recognition for live-verified performance.
- Industry bodies such as INBAC have a duty to convene these groups, publish practical guidance and keep the conversation grounded in engineering reality.

Through BTB and INBAC's events, we intend to carry these discussions forward and to document further examples from GIFT City and other leading developments across the country.

9. Acknowledgements
On behalf of INBAC and the BTB editorial team, I extend sincere thanks to the GIFT City authorities for their time, openness and hospitality during the visit, and to all delegates who joined the interaction. I am particularly grateful to Loveleen Garg, Chief Planner, and Dr. Nilesh Kumar Purey, Chief Technology Officer, for their time and insights.

Closing Thought
India will add an extraordinary amount of urban infrastructure in the coming decades. The question is not whether it will be connected, but whether it will be trustworthy. GIFT City shows us what planned, integrated infrastructure can achieve. A live certification such as VITAL points to the next step: infrastructure that does not merely claim to be smart, safe and sustainable, but demonstrates it every day.

A smart city, in the end, is one that can prove its own health. That is the standard I hope our industry will work towards together.

AUTHOR: MEHUL JOSHI
DESIGNATION: EDITOR-IN-CHIEF, INBAC BTB MAGAZINE

ONE BUILDING, ONE TRUTH: DESIGNING AN IBMS AROUND THE END USER

Every modern building produces a remarkable amount of data. Chillers report their loading, air handling units report temperatures and filter status, energy meters record every kilowatt-hour, fire alarm panels watch over life safety, and access control logs every door.
Yet in many projects this data lives in separate islands, each with its own screen, its own vendor and its own language. The facility manager ends up walking between five workstations to answer one simple question: **what is happening in my building right now?**

The Integrated Building Management System (IBMS) exists to solve exactly this problem. A well-designed IBMS consolidates all required data into a single platform, so that operators see one picture, act on one alarm list and report from one database. But as an HVAC design consultant, I have learned that the technology is the easy part. The harder, and far more important, part is understanding what the end user actually needs from the building.

Start with the business, not the points list

Too often, IBMS design begins with a points schedule: how many analog inputs, how many digital outputs, which protocols. These are necessary, but they are the answer. The question must come from the end user.

Before a single data point is selected, the design team should sit with the people who will own and operate the building and ask:

- What decisions do you take every day, and what information do you need to take them?
- What would a bad day look like, and how quickly must you know about it?
- Who will use the system: engineers, security staff, finance, top management, tenants?
- What reports do you submit to management, auditors or regulators?
- How will the building grow over the next five to ten years?

The answers shape everything, from which systems are integrated to how the dashboards are built. The same HVAC plant can need very different data depending on the business it serves.

Examples: same systems, different needs

A hospital. The business is patient safety and infection control. The facility head does not simply want chiller status; he needs to know that operation theatre pressure differentials, temperature and humidity are within limits, and that an alarm reaches the right person within seconds. The IBMS must therefore bring together HVAC, medical gas alarms, power backup status, fire alarm and nurse call escalation, and keep an audit trail of OT conditions. Here, data integrity and alarm priority matter more than attractive graphics.

A data centre or IT park. The business is uptime. Here the end user wants to see rack-inlet temperatures, precision cooling performance, UPS and DG status, and PUE trends on a single screen. Predictive alerts, such as a CRAC unit running at rising load with falling delta-T, are worth far more than a simple alarm after the room has already heated up.

A commercial office tower. The business is tenant satisfaction and operating cost. The owner wants floor-wise energy sub-metering for tenant billing, after-hours HVAC usage tracking, and comfort complaints linked to actual zone temperatures. The IBMS becomes a commercial tool as much as an engineering one, feeding data directly to the billing team.

A pharmaceutical or manufacturing facility. The business is compliance. Cleanroom temperature, humidity and differential pressure must be logged, time-stamped, and protected from tampering. The end user's auditor, not the engineer, is effectively the customer of the IBMS reports.

A hotel or mall. The business is guest and shopper experience together with energy cost. Occupancy-linked room control, footfall-based ventilation, and demand-controlled operation of the chilled water plant directly support both.

In each case, the equipment list may look similar on paper. The integration priorities, dashboards, alarms, and reports are completely different. Only a conversation with the end user reveals them.

Designing the single system

Once the business needs are clear, the design can follow a disciplined path.

1. **Define the systems to integrate.** HVAC and BMS, electrical and energy metering, fire alarm, access control, CCTV, lighting control, lifts, water and pumping systems. Not every project needs all of them; include what serves the stated needs.
2. **Prepare an integration matrix.** For every system, record the protocol (BACnet, Modbus, OPC, MQTT or other), the interface type (gateway or direct), the data to be exchanged, whether it is read-only or read-write, and who is responsible for it. Life safety systems such as fire alarm should generally be read-only to the IBMS, with the fire panel retaining full control.
3. **Insist on open protocols.** Proprietary systems create dependence on a single vendor for the entire life of the building. Open standards protect the owner's freedom to expand, service and upgrade.
4. **Build one database and one alarm philosophy.** A common historian and a common alarm hierarchy, with priorities agreed with the end user, prevent alarm floods and ensure that critical events are never lost among minor ones.
5. **Design dashboards by role.** The plant engineer needs equipment detail. The security head needs events and access status. The CEO needs energy, cost and comfort at a glance. One system, several views.
6. **Plan for cybersecurity and growth.** Network segmentation, user rights, logging and spare capacity should be part of the design from day one, not an afterthought.

Common mistakes to avoid

- Copying a previous project's specification without consulting the new end user.
- Integrating everything possible rather than what is useful, which leaves operators drowning in unused data.
- Leaving the integration responsibility unclear between the HVAC, electrical, fire and IBMS contractors.
- Ignoring operator training and handover documentation, so that the system is never used to its potential.

Conclusion

An IBMS is not a collection of screens; it is a tool for running a business. When all required data is consolidated into a single system, the building starts to speak in one voice, and the people who run it can finally act on facts instead of searching for them.

But that voice will say only what the design allows it to say, and the design is only as good as the questions asked at the beginning. As consultants, our first duty is to listen to the end user. Technology, protocols and points lists will follow naturally from that conversation.

AUTHOR: MUSTKIM A SAIYAD
DESIGNATION: DIRECTOR.
ORGANIZATION: PRIME CORE ASSOCIATES

FROM BUILDING MANAGEMENT TO BUILDING INTELLIGENCE

Implementing IBMS with a Cloud-Based EPM and IIoT Platform for Predictive Maintenance, AI-Assisted Decisions, and Workflow Optimization

For two decades, the Integrated Building Management System (IBMS) has been the nervous system of India's larger commercial campuses, hospitals, data centres, airports and industrial facilities. It brought HVAC, power monitoring, lighting, fire alarm, access control and CCTV onto a common supervisory layer and gave operators a single window into the building. That was a genuine step forward.

But a single window is not the same as a single brain. Most IBMS installations today still behave as sophisticated alarm-and-trend systems. They tell operators what is happening, usually after a threshold has been crossed. They rarely tell the organization what is about to happen, why it matters or what to do next.

The next phase of building automation closes that gap. By pairing a well-engineered IBMS with a cloud-based Enterprise Performance Management (EPM) layer and an Industrial Internet of Things (IIoT) software platform, owners can move from monitoring to anticipating, and from reacting to optimising. This article sets out what that architecture looks like, how to implement it sensibly, and where the real value lies.

1. Why the Conventional IBMS Is No Longer Enough

Three pressures are reshaping expectations of building technology in India.

Operating cost and energy intensity. Energy is typically the largest controllable operating expense in a commercial building, and chillers, air-handling systems and pumping dominate it. Inefficiencies that go unnoticed for months quietly erode margins and ESG commitments.

Asset reliability and uptime. In hospitals, data centres, pharmaceutical facilities and airports, a plant failure is not an inconvenience; it is a business-continuity or patient-safety event. Run-to-failure and calendar-based maintenance are both costly ways to manage risk.

Portfolio-level visibility. Owners of multiple sites, such as campuses, malls, townships and industrial parks, need comparable performance data across locations. A site-by-site supervisory system cannot provide that on its own.

A conventional IBMS was designed to answer the first-level question: is the system running within limits? The questions leadership now asks are different: which asset will fail next, what is it costing us to run this site versus that one, and which action will deliver the best outcome?

2. The Three-Layer Architecture

The integrated solution is best understood as three cooperating layers, each doing what it does best.

Layer 1: The IBMS and field foundation
This is the on-site backbone: controllers, field devices, sensors, meters, BACnet, Modbus and other open-protocol integrations, and the supervisory platform. Its job is reliable, deterministic control and clean data. No analytics layer can compensate for poorly commissioned points, mislabelled sensors or unreliable integrations. The quality of insight is capped by the quality of the data at source.

Layer 2: The IIoT software platform
The IIoT layer securely connects the building's operational technology to the cloud. It normalises data from diverse equipment and protocols into a consistent asset model, contextualises it (this chiller serves this wing, that meter feeds this tenant), and makes it available for analytics at scale. Platforms such as Honeywell Forge are designed for this role: aggregating operational data, applying analytics and exposing results through role-based dashboards and applications.

Layer 3: The cloud-based EPM layer
Enterprise Performance Management translates operational data into business performance. It benchmarks sites against each other and against targets, tracks energy, carbon, comfort, reliability and maintenance KPIs, and surfaces prioritised, actionable recommendations to the right stakeholder, whether that is the facility engineer, the regional head or the CFO.
Together, these layers turn a building from a collection of systems into a measurable, improvable business asset.

3. Predictive Maintenance: Fixing Problems Before They Announce Themselves

Predictive maintenance is usually the first use case that delivers visible returns.

Traditional maintenance relies on fixed schedules or on failure. Predictive maintenance uses continuous data, such as vibration, temperature, current draw, pressure differentials, run-hours and efficiency trends, to detect the early signatures of degradation. Examples include:

- A chiller whose approach temperature is slowly widening, indicating fouling long before a trip occurs.
- An air-handling unit fan drawing progressively more current for the same airflow, pointing to belt wear or filter loading.
- A pump operating away from its best-efficiency point, consuming extra energy and shortening bearing life.
- Valves and dampers that hunt or stick, creating comfort complaints and energy waste simultaneously.

The benefits are practical: fewer emergency call-outs, better spare-parts planning, extended equipment life, and maintenance effort directed at the assets that actually need it. Crucially, the cloud platform learns across a large installed base, so patterns identified on one site can improve fault detection on another.

A word of caution: predictive maintenance is not magic. It depends on adequate instrumentation, well-defined asset hierarchies and disciplined follow-through. An alert that is never actioned has zero value.

4. AI-Assisted Decision-Making: From Data to Recommendation

Buildings generate far more data than any operations team can interpret manually. AI and machine-learning models help in three ways.

Detection. Algorithms identify anomalies and faults, such as simultaneous heating and cooling, excessive after-hours load, or sensor drift, that rule-based alarms miss.

Diagnosis and prioritisation. Rather than presenting hundreds of alerts, the system groups related symptoms, estimates probable causes and ranks issues by financial, comfort or risk impact. Operators see a short, prioritised list instead of an alarm flood.

Optimisation. Models can recommend, and where the owner permits, execute, setpoint, scheduling and sequencing changes that reduce energy use while protecting comfort and process requirements, adapting to weather, occupancy and tariff patterns.

The key phrase is AI-assisted. In mission-critical facilities, the human remains accountable. The right design keeps experienced engineers in the loop: AI proposes, explains and quantifies; people approve and learn. Transparent recommendations that operators can understand build trust far faster than opaque automation.

5. Workflow Optimisation: Closing the Loop from Insight to Action

Insight that does not change behaviour is just reporting. The final, often overlooked, benefit of the integrated architecture is workflow optimisation.

When a fault is detected, the platform can automatically generate a work order, assign it based on skill and location, attach the diagnostic evidence, track the response time, and confirm closure through restored performance data. Over time, this builds a verified record of what was found, what was done and what it saved.

The operational gains include:

- Shorter mean-time-to-repair through better-informed technicians.
- Fewer repeat visits, because diagnostics travel with the work order.
- Transparent accountability across in-house teams and service contractors.
- Consistent, auditable reporting for ESG, compliance and management reviews.

For multi-site owners, the same workflows can be standardised across the portfolio, so a best practice discovered in one building is replicated everywhere.

6. Implementation: A Practical Roadmap

Based on what works in the field, we recommend a phased approach rather than a big-bang deployment.

1. **Define the business outcomes first.** Decide whether the priority is energy reduction, uptime, tenant comfort, carbon reporting, or all of them, and set measurable targets. Technology should follow the outcome, not the other way round.
2. **Engineer the foundation properly.** Ensure the IBMS design includes adequate metering, sensing and open-protocol integration. Retrofit gaps in instrumentation on critical assets. Develop a clean point list and naming convention at design stage.
3. **Establish the asset model and data governance.** Define asset hierarchies, ownership of data and access rights before connecting to the cloud.
4. **Design cybersecurity in from day one.** Segment OT and IT networks, enforce secure gateways, role-based access, encryption and patch management. Connecting a building to the cloud expands the attack surface unless it is deliberately managed.
5. **Start with a focused pilot**. Select a limited set of high-value assets, typically chillers and central plant, and demonstrate verified results within a defined period.
6. **Scale deliberately**. Extend to additional systems and sites, refine models with real operating data, and embed workflows into daily routines.
7. **Invest in people and change management.** The best platform fails if operators distrust it or lack the skills to use it. Training and clear role definitions are as important as software.
8. **Measure, verify and report.** Track benefits against baseline and share them with leadership. Continuous improvement requires visible proof of value.

7. Considerations for the Indian Context

Several factors deserve specific attention here.

- **Legacy and mixed-vendor environments.** Many Indian facilities combine equipment from multiple vintages and

manufacturers. Open-protocol integration and a vendor-agnostic data layer are essential.

- **Connectivity and resilience.** Site operations must continue safely if the cloud link is interrupted. Local control and edge intelligence should never depend on internet availability.

- **Data privacy and regulatory expectations.** Owners should be clear about where data is hosted, who can access it and how it is protected.

- **Skills availability.** Partnering with experienced integrators and service providers helps bridge capability gaps while internal teams mature.

- **Sustainability reporting.** Growing emphasis on green building certifications and corporate ESG disclosure makes verifiable energy and carbon data a strategic asset rather than a nice-to-have.

8. Measuring Success

The value of the integrated platform should be tracked through a balanced scorecard rather than a single metric:

- Energy consumption and energy-intensity trends against baseline.
- Unplanned downtime and number of emergency interventions.
- Maintenance cost and planned-versus-reactive maintenance ratio.
- Mean-time-to-detect and mean-time-to-repair.
- Occupant comfort and complaint trends.
- Carbon footprint and compliance reporting effort.

These measures give both the technical team and the boardroom a common language for performance.

Conclusion

The IBMS will remain the indispensable foundation of intelligent buildings. But on its own it is no longer the destination. Integrated with a cloud-based EPM layer and an IIoT software platform, it becomes the data engine for predictive maintenance, AI-assisted decisions and optimised workflows, shifting facility management from reactive firefighting to proactive stewardship.

The organisations that will lead are not necessarily those with the most technology, but those that pair sound engineering, disciplined data practices, strong cybersecurity and empowered people with the right digital platform. The buildings of the coming decade will not merely be managed. They will learn, anticipate and continuously improve.

The journey begins with a single, well-chosen step: a clear outcome, a clean data foundation and a pilot that proves the value.

AUTHOR: UDYAN DUTTA GUPTA
DESIGNATION: SALES LEADER
ORGANIZATION: HONEYWELL AUTOMATION INDIA LIMITED.

BEYOND SMART CLAIMS

THE CASE FOR SMART PROOF

VITAL and the shift from installed technology to validated building performance

By Sakhee Chandrayan | Thought Leadership

A building is not smart because it has technology. It is smart when that technology delivers measurable value.

THE QUESTION WE SHOULD BE ASKING

Across India, buildings are being described as “smart” because they have a Building Management System, connected sensors, energy dashboards or sophisticated controls. These investments matter. But somewhere along the way, we began treating installation as evidence of intelligence.

How do we know a building is truly smart after handover? Can its systems communicate? Can its operators act on the information? Can its performance be demonstrated, rather than merely promised?

A building may generate thousands of data points and still leave its facility team struggling to understand why energy use is rising or equipment is failing. Data without action is not intelligence.

FROM AUTOMATION TO INTELLIGENCE

Automation enables control. Intelligence enables better decisions.

The distinction matters: a dashboard showing yesterday’s consumption is useful; a system that highlights abnormal consumption, identifies likely causes and supports corrective action is far more valuable.

THE MISSING LINK: OPERATIONAL EVIDENCE

Design documentation tells us what a building was intended to do. Commissioning establishes whether systems initially worked. Marketing communicates the promise. But building performance changes every day with occupancy, weather, maintenance, system settings and human decisions.
That is why smartness cannot be established by a technology inventory alone. It needs a structured method to examine the digital backbone, interoperability, cybersecurity, resource efficiency and actual operational outcomes.

VITAL: PERFORMANCE, NOT PROMISES

VITAL — Validated Infrastructure for Technically Advanced Lifespaces — is an Indian smart-building rating and certification framework developed in association with **INBAC**. It aims to bring digital infrastructure and building operations into a common, evidence-led assessment.

Its central question is simple: What is the building delivering, and how can that be verified?

WHAT VITAL MAKES VISIBLE

A practical framework for a more accountable built environment

ONE BUILDING. CONNECTED PRIORITIES.

A truly intelligent facility cannot be understood one subsystem at a time. VITAL brings attention to interconnected capabilities: reliable networks, open building automation, appropriate cybersecurity controls, environmental monitoring, and energy and water intelligence.

For a commercial office, this can mean linking occupancy and indoor air quality information to ventilation decisions. For a logistics facility, it may mean dependable operational networks and earlier warning of equipment problems. In homes, it can mean integrated safety, resource monitoring and more adaptable controls.

The technology mix will differ. The principle should not: systems must serve the people and purpose of the building.

HOW THE ASSESSMENT WORKS

The documented VITAL process moves from application and baseline evaluation to expert review, then gap closure and verification, and finally a certification decision. Technical documentation and on-site assessment help turn assumptions into findings that owners and operators can act upon.

Certification should not be viewed as the end of the journey. Operational data, trends and corrective actions are what make building intelligence meaningful over time.

WHY IT MATTERS TO BUSINESS

The business case is not “more technology”. It is better use of what has already been invested.
Relevant outcomes may include lower avoidable energy use, more informed maintenance, reduced operational disruption, improved occupant conditions and clearer evidence for sustainability reporting.

None of these outcomes should be assumed merely because a certificate is awarded. They need to be measured against the building’s actual baseline. That is precisely why evidence matters.

AN INDIAN APPROACH, WITH GLOBAL RELEVANCE

India needs smart infrastructure suited to its climate, building stock, operational practices and economic realities — not a checklist of imported gadgets.

Open standards and interoperability can support this ambition by allowing multiple suppliers and generations of technology to work together.

INBAC’s role in convening the ecosystem is important here. Developers, consultants, OEMs, integrators, facility managers and policymakers all influence outcomes. No single participant can deliver intelligent infrastructure in isolation.

THE QUESTION FOR TOMORROW

We should stop asking only, “What smart products have we installed?” and start asking:

“What smart ecosystem have we created — and what is its return, every day?”

FROM INSTALLATION TO PERFORMANCE.

Smart buildings must be able to prove their value — every day.

AUTHOR: SAKHEE CHANDRAYAN
DESIGNATION: FOUNDER & PRESIDENT & VITAL - INDIA’S FIRST SMART BUILDING CERTIFICATION SOCIAL ENTREPRENEUR, EMPOWERING SMART COLLABORATIONS
ORGANIZATION: INBAC ASSOCIATION

CERTIFY SMART. BUILD TRUST.

VALIDATED INFRASTRUCTURE FOR TECHNOLOGICALLY ADVANCED LIFESPACES

"INDIA'S FIRST CERTIFICATION FOR BUILDING'S DIGITAL INFRASTRUCTURE, CONNECTIVITY AND TECHNOLOGICAL CAPACITY"

OCTOBER 2026

BUILDING TECHNOLOGY BIZBITS TEAM

Statutory Note

All content, including articles and images, published in this magazine is provided by individual contributors and remains their intellectual property. The publisher assumes no legal responsibility for any copyrighted material submitted. This publication is intended solely for educational and informational purposes, with no commercial objectives.

Mehul Joshi
Chief Editor

Sakhee Chandrayan
BTB Team

Shravani
BTB Team

Rupali Kale
BTB Team

Innovation and intelligence in every space - Team BizBits at the heart of transformation.