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DECEMBER ISSUE 2024

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THE EDITOR'S DESK

INSIGHTS FROM INDUSTRY VETERANS AND A CELEBRATED SUCCESS IN PUNE

The latest edition of the INBAC Magazine is a testament to the wealth of expertise within our community. It is graced by insightful articles from industry veterans who share their vision, strategies, and innovations in sustainable infrastructure, net-zero buildings, and smart urban solutions. These contributions reflect the transformative potential of knowledge-sharing and underscore the importance of collaboration in shaping a sustainable future.

This edition comes on the heels of INBAC's highly successful event in Pune, which brought together over 150 professionals and featured a vibrant exhibition with 10 exhibitors. The event highlighted cutting-edge technologies and sustainable solutions, leading to impactful, significant collaborations and MoUs. Panel discussions and workshops further enriched the discourse, offering actionable insights on pressing challenges like climate change, urbanization, and resource efficiency.

We extend our heartfelt gratitude to the authors for their valuable contributions and to all those who made the Pune event a grand success. As we continue to foster dialogue and innovation through our events and publications, we are reminded of the incredible potential that arises when industry leaders unite to address shared challenges.

Let this edition inspire us all to take bold strides towards a smarter, greener, and more resilient future.

Sincerely,
Dr. Amit Chaudhari (CFPS, LEED AP, PMP)
Editor-in-Chief
Building Technology BizBits Magazine
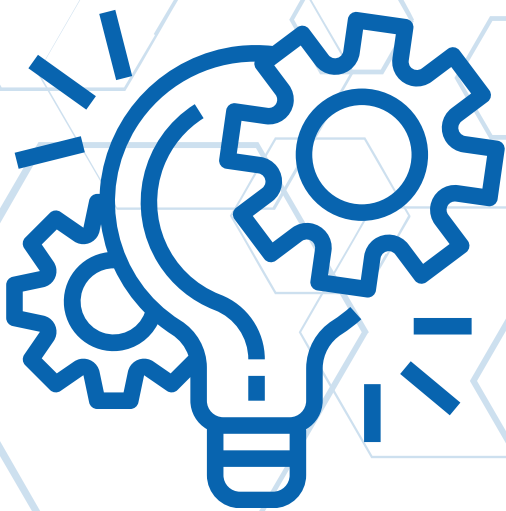
IMPORTANCE OF AUTOMATION IN PLUMBING

Modernization of the plumbing sector has been groundbreaking stimulating its advancement and progression. With evolution of technology automation has emerged as a driving force across industries, including plumbing. Its efficiency has surpassed traditional methods, making it a preferred choice to implement automated plumbing systems.

Automation in plumbing is becoming increasingly important as technology advances with demands of modern construction, maintenance, and water management method evolves.

Automation streamlines plumbing tasks, allowing them to be performed faster and with more precision. Automated systems can control water flow, temperature, and pressure, saving time in both installation and maintenance of system. Automated devices like smart faucets and water-efficient systems ensure that water is only used when necessary enhancing water savings.

Automation can lead to significant cost savings in both short and long term. It reduces the need for manual labor and lowers the risk of human error, which can result in less damage caused due to errors or rework. Automated leak detection systems can alert end users or businesses owners to solve problems early, preventing damage and expensive repairs. Additionally, automated plumbing systems often use less water and energy, contributing to lower utility bills.

Automation helps reduce human exposure to hazardous situations. For instance, plumbing technicians are less likely to be injured when using automated tools for tasks like pipe cutting or soldering. Additionally, smart water management systems can help detect leaks, blockages, or faulty installations that could lead to more dangerous situations, such as flooding or exposure to contaminated water.

The growing trend of "smart" systems, where plumbing devices are connected to the internet and can be controlled remotely through smartphones or computers. Smart water heaters, leak detection sensors, and thermostatic valves all contribute to a more comfortable, efficient, and sustainable living or working environment. These systems allow for proactive monitoring and control, which can prevent problems before they become serious.

With the global push for water conservation, automated systems play a key role in minimizing wastage of the valuable resource. Automated irrigation systems, smart meters, and water flow controllers help conserve water by adjusting usage based on real-time needs and conditions. Automation also allows for the optimization of water supply and drainage systems, leading to more sustainable practices.

Automation can enable predictive maintenance, where systems are continuously monitored and the anticipate plumbing system failure before it happens. This reduces the need for reactive maintenance, which can be more costly and disruptive. By identifying potential problems in advance, automated systems can alert technicians to perform maintenance or repairs at the right time, avoiding larger issues down the line.

Automated plumbing systems can collect and analyze data from various sensors, meters, and devices. This data can be used to optimize system performance, identify inefficiencies, and improve decision-making. For instance, monitoring water usage patterns can help identify leaks or unusual consumption that may indicate a problem. Data-driven insights can also help in designing and managing plumbing systems more effectively.

Plumbing Systems when automated leads to sustainability by helping reduce water and energy consumption. For example, automated water pressure regulators, smart showers, and energy-efficient water heaters all help minimize the environmental footprint of plumbing systems. These technologies align with global trends toward reducing waste, conserving resources, and improving environmental sustainability.

Modern plumbing systems can be integrated with IoT (Internet of Things) technologies, allowing users and technicians to monitor and control plumbing systems remotely. This can be especially useful for managing multiple properties or large facilities, where plumbing issues can be detected and addressed without the need for physical inspections. This capability saves time, reduces the need for on-site visits, and ensures faster response to issues. The integration of automation in plumbing not only makes the system more efficient and cost-effective but also enhances sustainability, safety, and overall system performance. As the industry evolves, automated plumbing solutions will continue to play a pivotal role in shaping the future of water management, reducing waste, improving the quality of service, optimize operational processes, reduce manual errors, and deliver exceptional customer experiences.

By improving efficiency and reducing waste, automation in plumbing is helping reduce the carbon footprint of buildings and infrastructures. Automated systems allow for precise control of water and energy usage, significantly lowering consumption while minimizing the need for repairs and replacements. These technological advancements in plumbing contribute to a broader trend of sustainable construction, making it easier for individuals and businesses to adopt environmentally responsible practices. As automation continues to evolve, it will play an increasingly crucial role in achieving global sustainability and reducing the carbon footprint of the built environment.

Automated Plumbing system will not only solve today's problems but will be able to anticipate tomorrow's needs, offering increasingly advanced and environmentally sustainable solutions. Incorporating automation into plumbing systems leads to greater efficiency, reduced waste, and improved sustainability. These advancements not only help conserve natural resources but also reduce costs and improve the performance of plumbing systems. As technology continues to evolve, the combination of automation and sustainability will likely become the standard in the plumbing industry, aligning with broader environmental goals.

BY RANJINI
ASSOCIATE PLUMBING, AECOM
INDIA

We are proud to announce the signing of an MoU between NAREDCO MAHI and INBAC Association!

This partnership aims to bridge the gap between real estate and cutting-edge building automation, promoting sustainable infrastructure, smart city solutions, and skill development initiatives.

Together, we are committed to redefining the future of real estate by embracing smart, efficient, and sustainable practices for a better tomorrow.

FOLLOW US ON

FUTURE EV MARKET IN INDIA AND EVOLUTION

The electric vehicle (EV) market in India has been experiencing significant growth and is seen as a key driver for the country's future mobility. As of 2024, the Indian government, automakers, and consumers are showing increasing interest in electric vehicles, driven by environmental concerns, government incentives, and technological advancements. Here are some key aspects of the EV market in India:

1. Government Policies and Incentives

- FAME Scheme: The Indian government has introduced the Faster Adoption and Manufacturing of Hybrid and Electric Vehicles (FAME) scheme, which provides financial incentives to encourage the adoption of electric vehicles. It was launched in 2015, and the second phase (FAME II), which began in 2019, focuses on expanding charging infrastructure and offering subsidies to manufacturers and consumers.

- State-Level Incentives: Several Indian states offer additional incentives for EVs, such as subsidies, tax exemptions, and rebates. Some states also provide benefits like road tax exemptions and reduced registration fees.

- National Electric Mobility Mission Plan (NEMMP): Aimed at promoting the manufacturing and adoption of electric vehicles in India, this plan envisions setting up an EV ecosystem that includes not only vehicles but also charging infrastructure and battery technologies.

2. Growing Consumer Interest

- Environmental Awareness: With rising pollution levels, especially in cities like Delhi and Mumbai,

many consumers are becoming more aware of the environmental impact of conventional internal combustion engine (ICE) vehicles. This has led to a growing preference for cleaner, electric options.

- Cost Efficiency: Although EVs still tend to have a higher upfront cost, their lower operational costs (electricity is cheaper than petrol/diesel, and maintenance costs are lower) make them increasingly attractive to consumers in the long run.

- Rising Fuel Prices: Increasing fuel prices and concerns over fuel security have also contributed to the growing interest in EVs.

3. Technological Advancements

- Battery Technology: Battery cost, range, and charging infrastructure are key factors influencing the EV market in India. Over the past few years, battery technology has improved, leading to better range and faster charging times. Companies are also focusing on reducing the cost of batteries, which is one of the highest components in an EV's cost.

- Charging Infrastructure: The availability of charging stations is growing steadily in India, though it's still a challenge. Many private companies, like Tata Power and Reliance, along with public initiatives, are expanding charging networks. Fast charging stations and home charging solutions are expected to further boost adoption.

4. Automakers' Shift Toward EVs

- Domestic Players: Indian automakers like Tata Motors, Mahindra Electric, and Hero Electric are making significant strides in the EV market. Tata Motors has been a market leader with its Nexon EV and Tigor EV models, while Mahindra Electric focuses on electric SUVs and three-wheelers.

- Global Players: International companies like Tesla, BYD, and MG Motor are also eyeing the Indian market. Tesla has faced challenges in terms of pricing and local manufacturing, but there are reports of Tesla considering manufacturing its vehicles in India.

- Electric Two-Wheelers: The electric two-wheeler segment is booming in India, driven by companies like Ather Energy, Ola Electric, Bajaj Auto, and TVS. Ola Electric, in particular, has generated a lot of buzz with its stylish electric scooters and aggressive expansion plans.

5. Market Segments

- Passenger Vehicles: The electric passenger car segment is growing, although it still represents a small portion of total car sales. Popular models include the Tata Nexon EV, MG ZS EV, and Hyundai Kona Electric. These models are becoming more affordable, with improvements in range and features.

- Two-Wheelers: Electric motorcycles and scooters are leading the charge, as two-wheeler vehicles make up a large share of India's vehicle fleet. The EV two wheeler segment is seeing rapid growth, with companies like Ather Energy, Hero Electric, and Okinawa leading the charge.

- Commercial Vehicles: Electric buses, e-rickshaws, and last-mile delivery vehicles are also gaining traction in India. Large public transportation fleets in cities are transitioning to electric buses, with manufacturers like Tata Motors and JBM Auto leading the way.

6. Challenges

- Battery Cost and Range Anxiety: While there has been progress, the high cost of batteries still makes EVs expensive. Additionally, range anxiety (concerns about battery life and charging infrastructure) remains an obstacle for many potential buyers.

- Charging Infrastructure: The charging infrastructure, although growing, is still limited compared to the number of petrol/diesel stations. There are concerns about the lack of a widespread, fast-charging network in many parts of the country.

- Consumer Perception: Many consumers are still skeptical about EVs due to myths about performance, charging time, and longevity. Additionally, a lack of knowledge about EVs and concerns over after-sales service are barriers.

7. Future Outlook

- Market Growth: The EV market in India is expected to grow at a compound annual growth rate (CAGR) of over 40% in the coming years. By 2030, it's estimated that electric vehicles could account for around 30% of total vehicle sales in India, driven by both policy support and technological advancements.

- Battery Manufacturing: India is also focusing on setting up its own battery manufacturing capabilities to reduce dependency on imports, especially from China. The government is exploring setting up large lithium-ion battery manufacturing plants, which could lower battery prices and make EVs more affordable.

- Transition to Clean Mobility: The transition to electric vehicles is part of India's broader strategy to reduce carbon emissions, combat air pollution, and improve energy security.

In conclusion, while the electric vehicle market in India is still in its early stages compared to global leaders, it is rapidly gaining momentum. With a combination of government support, improving technology, increasing consumer awareness, and expanding infrastructure, India is expected to become a major player in the global EV market in the years ahead.

BY AMOL BAGUL
DGM AT GREENCELL MOBILITY

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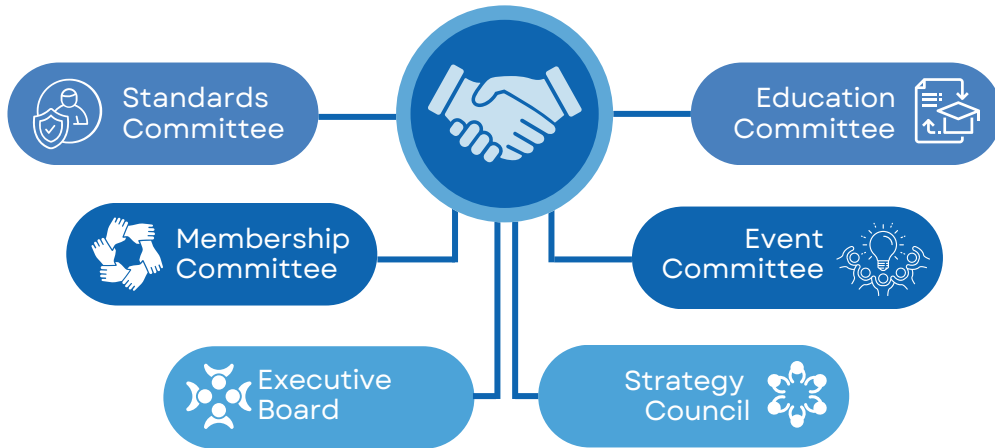
YOUR GATEWAY TO SMART FUTURE

- Standards Committee
- Education Committee
- Membership Committee
- Event Committee
- Executive Board
- Strategy Council

WHY INBAC?

- Lead smart infrastructure of Digital India
- Represent India on global platform
- Global collaborations and strong networks
- Drive the future of sustainable smart buildings

CONNECT — Public Private Partnerships

COLLABORATE — User & enterprise centric platform

CREATE — Value driven solutions

Indian				
	One Time Registration Charges (INR)	Fees Per Year (INR)	Fees for 3 Yrs (INR)	Total # of representatives
Corporate Associate	10,000	10,000	25,000	2
Individual	1,500	1,000	2,500	Self
Individual Add-on *	1,000	1,000	2,500	Self - Nominated
Student	0	NA	900	Self

**GST & Other Taxes Applicable

For UPI payment

360 degree stakeholder collaboration

- Project & Facility Managers
- Protocol Labs
- System Integrators
- Consultants Architects
- Building Owners
- OEMS & Suppliers
- Educational Institutes
- Government

ABOUT US

We are a non-profit community of building automation stakeholders, with the vision to facilitate an ecosystem that supports efficient, safe, healthy and connected buildings through globally accepted ISO based open standards in India.
To see India as a leader on the Building Automation world map, is deeply embedded in the DNA of INBAC.

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TECHNOLOGY HARMONIZING SUSTAINABLE SMART SPACES

With accelerating urbanization, challenges to manage energy and water consumption, reduce carbon footprint, and create a comfortable built environment are growing day by day in urban and semi-urban zones. Today, technological advancements offer solutions with conscious efforts, efficiency, and precision creating smart spaces, powered by intelligent building automation systems that seamlessly integrate technology and human interaction. These spaces leverage Internet of Things (IoT) devices, sensors, artificial intelligence (AI), and data analytics to create environments that are functional and responsive to the needs of occupants. By integrating smart technologies into buildings, infrastructure tech holds the potential to revolutionize urban spaces, making them more efficient, adaptable, and environmentally friendly.

The retrofit and transformation of conventional buildings into tech-enabled spaces include major infrastructure upgrades with smart systems incorporated with IoT-enabled systems and energy-efficient materials. Integrating the existing systems with monitors and taking it to a continuous mode requires efforts but they are benefitting with time. Sometimes, the efforts might ingress certain costs but have ROI workings planned against the savings.

New constructions, on the other hand, benefit from being designed as "smart" from the ground up, incorporating cutting-edge technologies like automated and sensor-based lighting, HVAC (heating, ventilation, and air conditioning) systems, and predictive maintenance. Building integrated management systems proves efficient and records savings in real-time with baseline considerations.

Energy efficiency is a cornerstone of sustainable smart spaces wherein EMS use advanced algorithms and AI to optimize energy usage,

ensuring that electricity, heating, and cooling systems operate at peak efficiency. Technologies like smart grids and renewable energy integration further enhance the sustainability quotient of buildings. Additionally, the integration and notification of comfort parameters add the right essence to the built environment. The alarm systems with CO_2 sensors, daylight and glare sensors along with moisture and temperature sensors create the right comfortable space against all odds.

Governments and industries worldwide are recognizing the potential of infrastructure tech in achieving sustainability goals. Many certification bodies add the aspect of monitoring through smart systems and consider the results driving the certification process. Indian Green Building Council (IGBC), LEED Certification, and WELL, are accelerating the adoption of these technologies and including them in the mainstream of their processes.

IoT sensors play a pivotal role in collecting real-time data about building operations. These sensors monitor everything from temperature and humidity to energy usage and occupancy levels. By analyzing this data, building management systems (BMS) can make informed decisions to optimize resource usage, reduce waste, and ensure occupant comfort. For example, motion-activated lighting systems can reduce energy consumption by up to 35%. Building automation systems equipped with predictive maintenance capabilities use machine learning algorithms to identify potential equipment failures before they occur. This minimizes downtime and reduces unnecessary repairs and energy waste. Smart water management systems monitor and control water usage. Features like leak detection sensors, automated irrigation systems, and greywater recycling contribute to significant water savings in both residential and commercial spaces.

Building automation systems also ensure seamless integration and management of renewable energy sources optimization, their direct use, losses, and storage.

This tech advancement helps projects go Net-zero – energy, water, waste, and carbon with constant monitoring and gap identifications wherein the circularity aspect is achieved and buildings generate, consume, and recycle in balance.

Smart lighting systems adjust brightness based on natural light availability and occupancy not only save energy but also enhance the well-being of occupants. Additionally, these systems often incorporate human-centric lighting, which mimics natural light cycles to improve productivity and health.

Role of Data and AI for Enhanced Efficiency

Data is the new God. Data drives building automation systems by harnessing the power of AI and data analytics. While infrastructure tech can uncover patterns and insights that drive more sustainable practices, it also favors data related to space utilization strategies, enabling organizations to downsize or repurpose underused areas, thereby reducing operational costs and environmental impact.

AI-driven systems facilitate real-time decision-making that proves extremely helpful during peak energy demand, with prioritized energy-intensive operations or trade-offs ensuring cost savings and reducing strain on power grids.

Tangible and Intangible Advantages

Environmental Impacts are projected tangible aspects. Smart spaces contribute to reduced greenhouse gas emissions and lower energy consumption, directly addressing climate change concerns. Efficient resource usage and renewable energy integration further enhance the cause. **Economic Efficiency** with Infrastructure tech is realized due to reduced operational costs through energy savings, predictive maintenance, and optimized resource usage. Businesses and homeowners benefit from low utility bills and reduced maintenance expenses. **Enhanced Quality of Life** with smart spaces designed to a human-centric approach prioritizes comfort, health, and convenience. Features like improved air quality, personalized temperature settings, and adaptive lighting enhance the overall experience of living and working in these spaces. **Resilience and Adaptability** with sustainable smart spaces are built to adapt to changing environmental conditions and occupant needs ensuring long-term viability and relevance.

Anticipated Challenges and Gaps

The impact of any additional aspect of technology can be realized with cost and time as major challenges.

Despite the numerous benefits, there are challenges to adopting infrastructure tech on a wide scale that include High Initial Costs, especially with retrofitting existing buildings with smart technologies. **Adaptation Issues** and integrating different systems and devices can be complex, especially in older buildings. Standardization and open protocols are essential to overcoming this barrier that invites expertise and experience. **Data Privacy and Security** along with increasing reliance on IoT devices and cloud-based systems, ensuring data security and privacy is critical. **Skill Gaps** are anticipated for deployment and maintenance of advanced building automation systems, which may pose challenges in some regions.

Future of Sustainable Smart Spaces The field of building automation is evolving rapidly, driven by innovations in AI, IoT, and renewable energy technologies. We are already coming across Digital Twins as a routine with virtual replicas of physical buildings that enable real-time monitoring, testing, and optimization without disrupting operations. Decentralized Energy Systems with buildings functioning as independent energy units that generate, store, and share energy locally, contributing to energy resilience. BIM – Building information modeling facilitates every detail with precision integrating all elements in the building and giving a comprehensive result and solution to data. BIM is at the forefront of creating sustainable smart spaces, transforming how buildings operate and interact with their environment by prioritizing energy efficiency, resource optimization, and occupant well-being. While challenges remain, the long-term benefits of reduced environmental impact, economic efficiency, and enhanced quality of life make sustainable smart spaces an indispensable part of urban development. As innovation continues, the integration of building automation systems into infrastructure will undoubtedly pave the way for a greener, smarter, and more sustainable world.

BY DR (AR). MRS. ANSHUL P GUJARATHI
FOUNDER DIRECTOR, ECO-SOLUTIONS

A MECHANICAL ENGINEER'S VIEWPOINT ON BUILDING AUTOMATION SYSTEM

A few years back, I was having a conversation with a Director of Engineering (DoE) in a large premium hotel. As you would guess, the DoE was a mechanical engineer and our talks revolved around how his smart hotel had modernized multiple systems.

He was happily explaining the improvements undertaken in the chiller plant room, the fresh air units and even the lighting systems. However, the moment I asked him "what about building automation", the DoE paused and said " BAS is brilliant on PowerPoint. It does not work at site"

His words reminded me of statements of other facility managers.

-"Too complex for my technicians"

-"System always down or non-functional in parts"

-"The BMS engineer himself cannot solve issues"

-"My experience is much better than these computers"

Now let us zip back into the present. **The digitization age.**
Over the last 20 years, India has witnessed unprecedented growth in the building and infrastructure space. Cities across India have expanded their geographies .at a rapid pace. Mega IT hubs, data centers, commercial offices and thousands of employees working in these spaces brought their demands of smart housing, smart travel and smart utility management. These employees also needed hotels and entertainment destinations like malls and cinema houses.

Over the last 20 years, India has witnessed unprecedented growth in the building and infrastructure space.

Cities across India have expanded their geographies .at a rapid pace. Mega IT hubs, data centers, commercial offices and thousands of employees working in these spaces brought their demands of smart housing, smart travel and smart utility management. These employees also needed hotels and entertainment destinations like malls and cinema houses.

One interesting thing happened with this rapid urbanization - **A change in the consumer habits.**

-People were driving using Google maps.

-Alexa played music and operated houselights

-Smartphones did banking and share market investments.

-Smartphones checked them in at airports and hotels.

-Hi-speed elevators and travelators zipped through large airports and malls.

PC : Google, telegraphindia and multiple websites

As the consumer changed, seamlessly liking an smart domestic lifestyle, they wanted it also in their office spaces, their malls, their hotels. Building automation had made a silent entry into the consumer's mind space.

Adding purpose to the adaption of automation was the entry of sustainability and green build environments. Clients and architects wanted their buildings to be energy efficient, recycle waste, adapt to changing dynamics (internal and external) and most importantly, be connected to their smart devices. Words like IOT, Cloud or AI were suddenly zipping around in project descriptions and tender documents.

From being in the sidelines, the building automation system was suddenly pushed on centre stage, with a bright spotlight. It not only had the capability of integrating multiple MEP utilities, but also of monitoring, controlling and optimizing them. The system could speak to a single person via a desktop PC or to multiple devices across continents over the internet.

An important question now arose for the many mechanical engineers …

Could the building automation system really help us to design and maintain a build environment ?
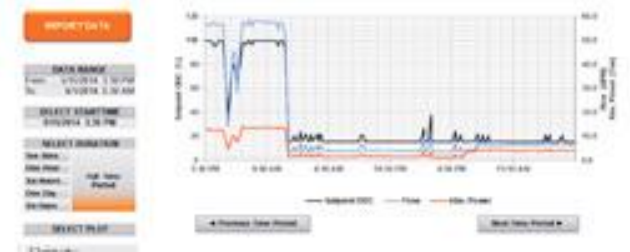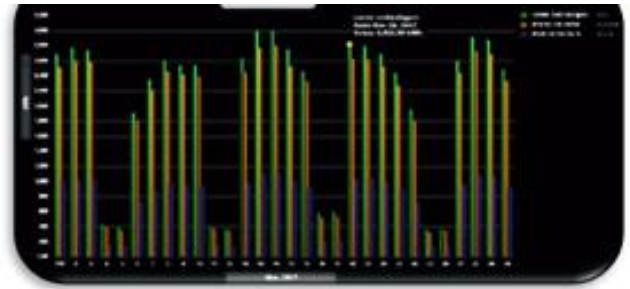
As building automation progressed, it brought in higher data transparency, reduced complexities, reduced investments, higher reliability and lot more flexibility. Smart data scientists made algorithms that assisted mechanical engineers in preventive and predictive maintenance and assess root causes of failures. Within minutes, thousands of data points could be crunched into sensible patterns, displaying this complex data into user-friendly chart and dashboards.

An engineer could now monitor and optimize air-conditioning, fire detection and protection, lighting, solar, pumping, access and security systems without having to worry about downtime and snags. Open protocols and knowledge upskilling of FM teams ensured reduced dependency on pricey vendors. The system could also help the engineering team on new requirements such as indoor air quality management and reduced carbon footprints.

Building automation systems have now positioned themselves as cornerstones in design and execution of smart, sustainable and green spaces.

In the following article, we shall deep dive into how BAS seamlessly integrates mechanical systems.

BY TUSHAR SHINDE
NATIONAL HVAC SPECIALIST

CLIMATE CHANGE AND ITS MITIGATION THROUGH BMS/BAS

Climate change needs no introduction. For reasons known to us, we have been tough on nature since the industrial revolution thereby changing the climatic landscape of the globe. As the fangs of natural calamities started to strike, nations spurred into action through various protocols and resolutions at annual COP's (UNFCC). India has been fore runner in her commitment to reduce the carbon intensity of the economy by 45% within 2030 from 2011 levels. The built environment in urban areas contributes a whopping 40% of India's infrastructure and consumes 38% energy produced. According to the International Energy Agency, buildings and building construction sectors combined are responsible for 30% of global energy consumption and nearly 27% of total energy sector emissions. Rapid urbanization has triggered India to re-think how she builds her cities. As per SBI research, India is expected to grow her urban population to 35-37% from 31.1% in 2011. That growth is humongous. Amidst colossal buildings, urban heat island effect's pinch is being prominently felt. All 141 Indian cities show an increase in night-time land surface temperature, with an average increase of 0.5 °C/decade. Bangalore, who till date was enjoying its Temperate climatic zone, have started having hotter nights.

It is evident that city centres and urban residentials contribute significantly to the Urban Heat Island (UHI) effect. While urbanisation is inevitable, fundamental question appears on how we can navigate humanity through climate change implementing stricter monitoring and control mechanisms. Building maintenance system (BMS) or Building automation systems (BAS) has been the silver lining in the cloud, instrumental in redefining building facility management to achieve optimum energy efficiency. Speaking of India, green building guidelines have mandated BMS/BAS through various governing bodies such as ECBC, GRIHA, IGBC, LEED, etc.

Market study done by renowned company, wherein they observed that "80% of all commercial spaces are in buildings, which are not equipped with smart technologies". Depending on a building's type, geography, climate zones, size, consumption patterns, technology, connectivity, and use of data, we can achieve considerable cost and energy savings. Moving forward, we shall try to unveil how BMS helps in holistic approach towards energy and water efficiency of a building thereby reducing energy footprint and an effective push towards sustainability.

REAL TIME DATA COLLECTION AND MONITORING: -
BMS has this inherent characteristic to constantly monitor the health of the building thus predicting failures, through early warning signals, even before they materialize. Through integration of hardwired or RF sensors and IOT devices across all electro-mechanical equipment's, advanced analytics has made it possible to streamline trouble shooting processes and propose countermeasures. So now a facility manager knows "what to do" and "when to do".

BMS continuously monitors the mileage of all equipment's and maps energy consumption patterns. This gives us a diurnal, nocturnal, seasonal and annual trends in consumption. Once such trend is in place, data analysis helps to keep the equipment's in check thereby minimizing energy leakages. For instance, lets understand through the below instances: -

- BMS can integrate UPS Battery Bank Monitoring System which can monitor and maintain cell voltage, total bank voltage, discharge current, and relative current response value. This identifies faults, which in turn can help BMS to control the battery voltage through sequential operation.
- BMS can detect if HVAC systems are operating sub-optimally, consuming more energy than necessary. By identifying these issues early, operators can address them before they escalate into bigger problems, leading to more energy waste.
- IOT based management can dim (dimmers) or switch off lights in unoccupied areas (daylight/occupancy sensors) or adjust the temperature (demand control air conditioning) based on the number of people in a room.
- BMS can detect moisture (soil moisture sensor) in soil thereby simulating irrigation pumps when to water the landscape areas. This enhances water conservation and reduce pumping energy usage.
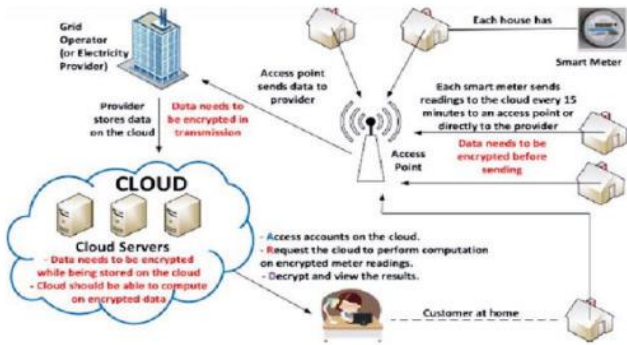
EFFICIENT ENERGY USE BY SMART METER MONITORING (Image source- https://www.researchgate.net/publication/336886440)

INTEGRATION IS THE KEY: -

A decade ago, most buildings used to have standalone monitoring system. Now analytics have made it possible to integrate multiple buildings thus creating a holistic monitoring system through cloud-based application programming interfaces (API's). More the data, more advanced analytics can help in predictive analysis. Let's understand through an example. A textile conglomerate has factories in 4 locations across the country. They face pump failures at all their facility some time or the other. Now, a pump trip/failure can occur due to multiple mechanical and electrical issues such as MCCB trip, motor overheating, non-aligned shaft, air vessel leakage, non-availability of water, etc.

Such failures can be mapped with specific building portfolios, frequency of occurrence and create maintenance records. There will be pre-loaded troubleshooting measures from OEM in the API which helps facility managers reduce downtime. Advanced analytics can analyse various troubleshooting measures through cost benefit considerations as well.

A similar example can be drawn upon from a city-wide monitoring of government establishments. Suppose they use chillers to meet their air-conditioning demand.

All chillers have local control through chiller plant managers. However, when we integrate all these plant managers into a single cloud platform, it provides real time data, effective centralized control, asset spare management, & predictive analysis. Since HVAC constitute nearly 60% of energy in any facility, rigorous monitoring of consumption patterns (TR generated vs KW consumed) can enhance energy savings.

Incentivizing amongst a facility group across geography may promote sense of accomplishment and nurture awareness in facility management thereby making such facilities energy conscious.

WAY FORWARD: -

JLL a leading real estate firm quotes "Low carbon buildings create economic value". Low carbon is promoted by low energy footprint. Building Management Systems is not a full-proof prescriptive remedy to climate change, but when effectively used, they can significantly reduce a building's overall energy consumption. BMS buildings can effectively reduce anywhere between 15% to 25% from that of a non-BMS building depending on the extent of use. The move towards more intelligent, connected, and sustainable buildings is not just a trend, but a necessary step towards a more energy-efficient future- A future we build for our upcoming generation's!

*BY ABHISEK CHATTERJEE
SENIOR MANAGER AT L&T*

Building Automation Community Expo & Connect–Convention is a platform for three fundamental change makers – Trust, Technology and Togetherness!

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Take a self-upgrade capsule

EXPLORING BIM IN THE CONTEXT OF INDIAN AECO INDUSTRY & ITS CHALLENGES

BIM (Building Information Modelling) has various definitions. BIM is an acronym for Building Information Modelling or Building Information Management. Some relatable definitions are "BIM is the virtual construction of the building and the process helps to avoid many unforeseen situations with the use of advance BIM tools and advance methods of construction," "BIM is the use of a shared digital representation of a built object (including buildings, bridges, roads) to facilitate design, construction, and operation processes to form a reliable basis for decision making."

BIM adoption statistics in India:

Project stakeholder wise BIM adoption statistics
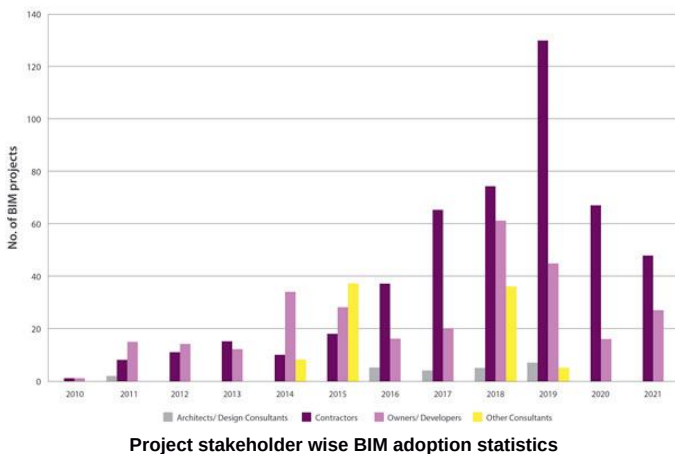
Source - Dhopte, S., Daga, A. Exploring the journey of BIM in the Indian AECO industry (2008–2022) an excelize perspective. CSIT 10, 159–174 (2022). https://doi.org/10.1007/s40012-022-00364-9

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There has been a major change in roles and responsibilities across different stakeholders as a result of the continuous awareness and use of BIM. One of the early adopters of BIM without hesitation is notably the Architectural fraternity. Better control over changes in design and ease in dealing with repetitive tasks have been their major reasons to do so.

BIM is becoming increasingly popular for owners and developer-based companies as well since it helps in achieving the seamless communication between the different project stakeholders hired by the developers and achieve the transparency in completion of daily tasks to have a better control and monitor projects with better supervision which is otherwise absent in traditional practices. This helps the developers establish better bonds with their consultants and drive project processes in a streamlined manner. In India, renowned real estate developers like DLF, Shahpoorji Pallonji, Tata Realty, Tata Housing, Birla Estates, Oberoi Realty, Rustomjee and many others have harnessed the use of BIM and are driving the processes to achieve desired results.

The contractor community has also realised the benefits of BIM and have started spreading their wings to achieve the desired results which were otherwise difficult to achieve. Their benefits mainly involve detailed material procurement, coordinated and detailed drawing sets leading to better coordination and streamlined outcomes.

Reasons for increase in demand for BIM in the Indian Industry:

The demand for Building Information Modelling (BIM) in the Indian construction industry has been increasing due to several reasons. Here are some key factors contributing to this trend:

1. Government Initiatives: The Indian government has been promoting the use of BIM in infrastructure development. Initiatives like the Smart Cities Mission and the Pradhan Mantri Awas Yojana (PMAY) have encouraged the adoption of BIM.

2. Increased Efficiency: BIM helps streamline the construction process by reducing errors, improving collaboration, and enhancing project visualization. This leads to faster project completion, reduced costs, and improved quality

3. Growing Infrastructure Development: India's rapid infrastructure growth, including transportation systems, commercial buildings, and residential complexes, has created a huge demand for BIM.

4. Competitive Advantage: Companies adopting BIM gain a competitive edge in the market. BIM enables them to deliver projects more efficiently, reducing costs and improving customer satisfaction.

5. Digital India Initiative: The Digital India initiative aims to transform India into a digitally empowered society. BIM adoption aligns with this initiative, promoting the use of digital technologies in the construction sector.

6. International Collaboration: Indian construction companies are increasingly collaborating with international firms, which often mandate the use of BIM. This has driven the adoption of BIM in India.

8. Cost Savings: BIM helps reduce costs by minimizing errors, optimizing material usage, and improving construction planning.

9. Environmental Benefits: BIM enables the creation of sustainable and energy-efficient buildings, which is essential for reducing India's carbon footprint.

10. Industry Awareness: Growing awareness about the benefits of BIM among architects, engineers, contractors, and owners has contributed to its increased adoption in India.

These factors have collectively contributed to the growing demand for BIM in the Indian construction industry.

Projects completed using BIM in India:

While India is still in the adoption stage and is yet to mandate the use of BIM despite its known benefits, there are quite a few remarkable projects which have been completed with harnessing the powers of BIM. Below are some projects:

- Bangalore International Airport: Bangalore International Airport Limited (BIAL) utilized Autodesk BIM 360 for the design, construction, and operation of Terminal 2, making it the first infrastructure project in India to integrate Building Information Modeling (BIM) across the entire project lifecycle.

- Nagpur Metro Rail Corporation: The Nagpur Metro Rail Corporation utilized 5D Building Information Modelling (BIM) to improve project management, reduce errors, and enhance collaboration among stakeholders, resulting in significant time and cost savings.

- Delhi Metro Rail: The Delhi Metro Rail Corporation has successfully implemented Building Information Modelling (BIM) in its Phase IV project, resulting in optimised model design, increased collaboration, and digitised design-to-execution workflows, with benefits including a 33% reduction in project duration and construction costs, and a 43% increase in labour productivity.

- Chhatrapati Shivaji International Airport Terminal 2: The Chhatrapati Shivaji International Airport's Terminal 2 was designed and constructed using Building Information Modelling (BIM), enabling efficient collaboration, clash detection, and simulation, resulting in a 20% reduction in construction time and a 15% reduction in costs.

- Chenab Bridge (Kashmir): The Chenab Bridge in Kashmir, the world's highest rail bridge, was designed and constructed using Building Information Modelling (BIM), enabling precise engineering, clash detection, and simulation, to ensure the bridge's stability and safety in the challenging Himalayan terrain.

- Jio World Centre (Mumbai): The Jio World Centre in Mumbai, a 18.5-acre mixed-use development, was designed and constructed using Building Information Modelling (BIM), enabling integrated project delivery, clash detection, and simulation, to ensure efficient construction, reduced errors, and improved building performance.

CURRENT PRACTICES OF BIM IMPLEMENTATION IN INDIA:

As a BIM implementation strategist from the Developer's side, there have been a couple of methods of implementations that have been tried and tested and I would like to share my experience with each of these methods.

Strategy 1: BIM modelling to be done by the design consultants, a third-party BIM Management agency to coordinate between all design consultants, verify the BIM models and anchor clash detection processes. This strategy did not work well. The main reasons were the lack of experts in the BIM field and the high software costs due to which expecting good quality BIM models from the design consultants was challenging.

Strategy 2: BIM Modelling to be done in-house at the developer's office. This strategy had similar challenges like the earlier one and managing the team of modellers along with the increasing project workload was an even bigger challenge which led us to adopt the 3rd strategy

Strategy 3: All discipline models to be modelled by a third party BIM agency. Inputs to be provided by design consultants and checked by in-house design coordinators and then shared with the hired BIM agencies. This module has its own challenges but still works better than the earlier two strategies. Lack of skilled labour, site-ready construction drawings, modellers with only software experience and no design knowledge are some of the key areas where difficulties arise in receiving the required outputs

CHALLENGES FACED FOR BIM IMPLEMENTATION IN THE INDIAN AECO INDUSTRY:

Lack of Awareness and Training: Limited knowledge and understanding of BIM among architects, engineers, contractors, and owners.
High Initial Investment: Significant upfront costs for software, hardware, and training.
Data Management and Integration: Difficulty in integrating BIM with existing systems, software, and workflows.
Interoperability Issues: Incompatibility between different BIM software and formats.
Change Management: Resistance to adopting new technologies and workflows.
Lack of Standardization: Absence of standardized BIM protocols, guidelines, and templates.
Insufficient Infrastructure: Limited access to high-speed internet, computing resources, and software.
Regulatory and Legal Framework: Lack of clear regulations, laws, and policies supporting BIM adoption.
Collaboration and Communication: Difficulty in coordinating and communicating among stakeholders.
Talent Acquisition and Retention: Difficulty in finding and retaining skilled BIM professionals.
Language and Cultural Barriers: Communication challenges due to language and cultural differences.
Project Complexity and Size: Difficulty in implementing BIM on large, complex projects.
Return on Investment (ROI): Difficulty in measuring and justifying the ROI of BIM implementation.
Lack of BIM Champions: Limited availability of leaders and champions to drive BIM adoption.

Addressing these challenges will be crucial for successful BIM implementation in India.

BY JONAKI BHAYANI
DESIGN MANAGER (BIM/ VDC)

VALIDATED INFRASTRUCTURE FOR TECHNOLOGICALLY ADVANCED LIFESPACES

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VITAL's history is one of global-firsts. As a business that champions cutting-edge technology, VITAL provides the only two certifications that rate a building's digital infrastructure, connectivity and technological capacity. VITAL is a leading building technology company assessing and improving digital connectivity and smart technology within homes and offices around India.

At its core, VITAL provides clarity about the buildings in which we live and work. VITAL assesses a building's digital infrastructure and certifies its future-readiness through a refined digital lens.

VITAL doesn't just measure a building's technology at face-value, but considers how to better-connect those living and working within the building itself, so our transition into the future is as smooth as possible. Whether it's commercial or residential, an occupied building or a new development, a certification from VITAL will help set you apart from your competitors, and promote your building's digital connectivity and smart capabilities.

THE PURPOSE OF THE SMART DIGITAL INFRASTRUCTURE BUILDING RATING SYSTEM IS TO :

1. Guide the Development of Smart Buildings: Provide a clear framework for integrating digital and smart technologies into building design, construction, and operation, ensuring these technologies enhance performance in areas such as energy management, indoor environmental quality, occupant comfort, and building automation.

2. Assess and Certify Building Intelligence: Establish a standardized methodology for evaluating the digital and smart capabilities of a building, including how well its infrastructure supports data-driven decision-making, automation, and sustainability.

3. Promote Sustainability and Efficiency: Encourage the adoption of digital technologies that optimize resource usage (energy, water, and waste), reduce environmental impact, and contribute to a circular economy.

4. Enhance Occupant Experience and Well-Being: Focus on the human-centered aspect of smart infrastructure by ensuring that buildings adapt to the needs of occupants, improve comfort, safety, and health, and offer seamless connectivity and services.

5. Ensure Future-Proof Design and Scalability: Provide guidance on designing buildings with flexible and scalable digital infrastructures that can evolve with future technological advancements and changing user needs.

6. Align with Climate NET ZERO and Smart City Goals: Support global efforts to create a NET ZERO environment with more sustainable, livable cities by encouraging the integration of smart infrastructure in buildings that align with smart city initiatives and climate action goals

# VALIDATED INFRASTRUCTURE FOR TECHNOLOGICALLY ADVANCED LIFESPACES

SCOPE: MULTI-ASSETS

- Residential
- Commercial Core & Shell Office Buildings
- End Use Occupier Office Buildings
- Institution, Hospitality, Healthcare & Retail
- Factories, Warehouses & Logistics Parks

CREDIT UID	9 Pillars of VITAL	AVAILABLE SCORE
DIC	Digital Infra + Connectivity	20
DRR	Digital Readiness + RESILIENCE	10
H & WB	Health & Well Being	10
SR	Sustainability Reporting	20
O & M	Operations & Maintenance	10
LSS	Life Safety & Security	10
LIFE	Lifestyle for Environment	10
CS & IO	Cybersecurity & Interoperability	4
ITS	Innovative Technologies and Services	6
TOTAL		100
RATING LEVELS		
Certified		50-59
Silver		60-69
Gold		70-79
Platinum		80-100

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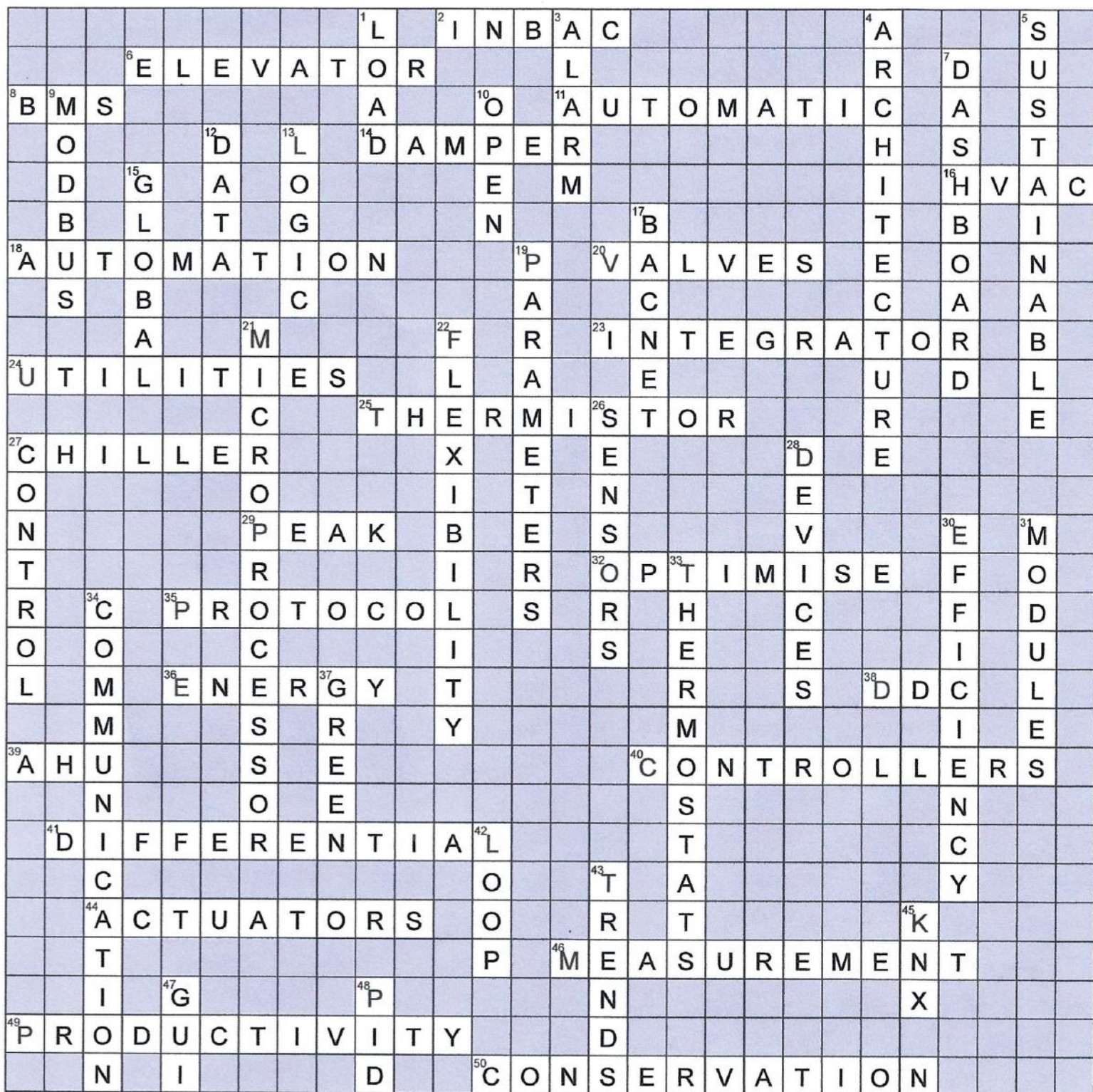
EclipseCrossword.com

Across

2. INBAC — Our community

6. ELEVATOR — What goes up comes down

8. BMS — Could it be BAS

11. AUTOMATIC — I do nothing

14. DAMPER — controls exitement in the air

16. HVAC — maximum members with maximum load

18. AUTOMATION — on its own

20. VALVES — of modulating types

23. INTEGRATOR — This guy puts it all together

24. UTILITIES — Also services?

25. THERMISTOR — Resistive temperature device

27. CHILLER — Small guy for food and hulk for the building

29. PEAK — systems are designed for this load

32. OPTIMISE — Make most appropriate

35. PROTOCOL — The ettiquettes of machine conversation

36. ENERGY — Outcome of burning

38. DDC — Data retail center

39. AHU — Airbender trickbox

40. CONTROLLERS — The Brains

Across

41. DIFFERENTIAL — Value after substraction
44. ACTUATORS — They make it happen
46. MEASUREMENT — Act of counting
49. PRODUCTIVITY — Measures your work speed
50. CONSERVATION — Keep safe for future

Down

1. LOAD — Burden to carry
3. ALARM — Denotes potential disaster
4. ARCHITECTURE — System plan on paper
5. SUSTAINABLE — can live for generations
7. DASHBOARD — Came first in cars, now common everywhere
9. MODBUS — Process language
10. OPEN — Not proprietary
12. DATA — Information bundles
13. LOGIC — Common folks fail to understand
15. GLOBAL — New class of citizens
17. BACNET — Ashrae speaks, so do we
19. PARAMETERS — Measures that define something
21. MICROPROCESSOR — small but clever unit of intelligence
22. FLEXIBILITY — Gymnastic ability
26. SENSORS — Technical noses
27. CONTROL — Manage
28. DEVICES — They are out there
30. EFFICIENCY — where hundred percent is never never
31. MODULES — Building blocks
33. THERMOSTATS — Counts and sets cold levels
34. COMMUNICATION — Key to achieving integrated systems
37. GREEN — This colour is our goal
42. LOOP — Circle of control almost
43. TRENDS — How fashion moves
45. KNX — Free speech from chilled countries.
47. GUI — You and I need to talk
48. PID — Complex mathematical functions in one box
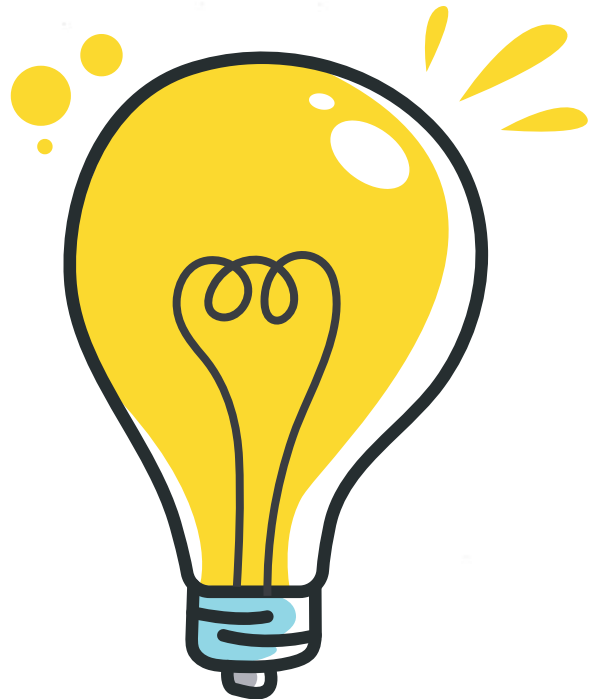
"Every blank space is a chance to find your next clue–keep going, you've got this!"
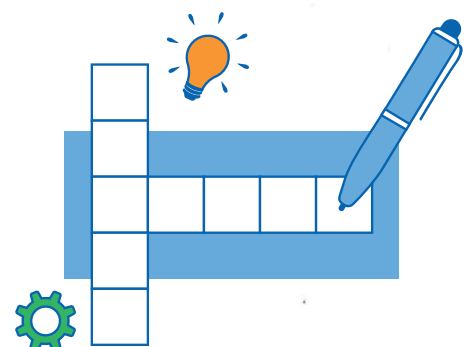
Building Technology BizBits Team

Dr. Amit Chaudhari

Dr. Amit Chaudhari, a grounded leader at KPM Engineering Consultants, known for his approachability and noteworthy achievements. With a down-to-earth demeanor and a wealth of experience, holds a doctorate and master's degrees in management and engineering respectively. My certifications, including CFPS, PMP, and LEED AP, reflect the dedication to excellence. My passion is in designing sustainable infrastructure that positively impacts everyday lives. From India's tallest building to its largest township, my experience embodies values like climate resilience and energy efficiency, making a real difference in urban communities.

Sakhee Chandrayan

22+ years industrial experience leading global teams for product strategies, businesses and customer experience focused on enterprise-scale software for sustainable building solutions and open standards and protocols. She has been engaged in the techno-social movement in India by bringing together visionary industry leaders to create an ecosystem for sustainable growth and interdependence empowering Smart Infrastructure in India.

Dipti Inamdar

With 4+ years of dedicated experience in the Human Resources field and an extensive background spanning 8 years in the dynamic Media and Entertainment industry, currently working with INBAC Association as operations Executive.

Aparna Inamdar

Working as Operations executive at INBAC Association. With commerce background, bring expertise in process optimization. Exploring new domains like social media publication.

Anukriti

Total of 6+ years of experience in ELV and Building Automation products. Currently working as Sales Co-ordinator in Jay & Co. India Pvt. Ltd.

Statutory Note

"Individually, we are one drop. Together we are an ocean"