From the Director, BASDIV, ISA – Rathan Bala

Building automation system is a network of controllers connected to diverse systems in a building with a dashboard view and ease of control into the building’s systems. Users benefit from improved occupant comfort, efficient operation of building systems, and reduction in energy consumption and operating costs. The current technology of building automation systems far exceeds what we have seen in the past with the introduction of latest technologies like IoT, Cloud, Artificial Intelligence etc.

The purpose of BASDIV (Building Automation Systems Division) of ISA is to be a home for building automation professionals within the larger automation society and to create networking platform of professionals connected with this vertical. BASDIV will be strategically positioning to peers as a source of certification and education, increase professional competency, standards to review, and write Recommended Practice Advisories.

As per statistics 40% of world’s energy consumption is in buildings and a stunning 50% of this can be saved by optimizing the energy consumption. Building Automation Market is estimated to reach $67.1 billion by 2022 growing at a CAGR of 9.6% from 2015 to 2022. However, some of the factors restraining the market growth are limited availability of skillful experts and need for comprehensive standards for integration of multiple technologies and multiple vendors.

The focus of the Building Automation Systems Division (BASDIV) of ISA is:
1. To bring together the professionals connected with BAS Technologies like the technologists, service providers, manufacturers, system integrators, building architects and building developers etc.
2. To share the knowledge in this complex and multidisciplinary domain and maximize utilization of this technology for improved energy management, occupants’ comfort & safety.
3. To create more number of certified system designers, engineers and technicians with the required skill set to handle successfully the BAS Projects all over the world.

If you are connected with Building Automation Systems in any capacity as practicing engineers, end users, solution providers, students interested in BAS, Architects, Builders etc.

Join ISA and BASDIV for professional networking
https://www.isa.org/
https://www.isa.org/basdiv
For queries email to: rathan@rsbizconsultant.com
Building automation systems (BAS) is a distributed control system to monitor & control various building services facilitating building operation and maintenance. This also provides user level visualization and MIS data. These systems may be deployed in industrial infrastructures such as factories, in enterprise buildings, malls, residential communities etc. Apart from HVAC, water, waste management, IT infrastructure etc. they are often connected to security systems like access control, CCTV, intrusion systems etc.

BAS provides many benefits

- Increase Occupants’ Comfort.
- Ease of maintenance.
- Minimize operational Cost for the building
- Increase Energy efficiency.
- Reduced risk with exceptional alarm management and integrated security.

Growing demand for energy efficient systems and demand to address security concerns and disaster management have played key role in boosting the market growth of BAS which is currently one of the strong contenders for high growth application-technology verticals. To get all the desired functionality in a complex infrastructure, multiple technologies are required with interfaces to the BAS system. The integration of distinct technologies makes BAS somewhat complex.

Architecture Levels

The architecture of this distributed system can be organized into three layers: The lowest layer is known as the Field Layer where the field devices (sensors, actuators) are located; the middle layer is the Automation Layer, where measurements and inputs are processed, control loops are executed and alarms are activated; and the top layer is the Management Layer where activities like system data presentation, forwarding, trending, logging, and archival take place.

Communication networks

The backbone of the field level communication is a digital data bus that allows communication between devices at the field level and application controllers. IoT enabled devices enhances the capability of field devices in their integration to the higher layers. While fieldbuses are used at the field level, it is common to aggregate data via a common (IP-based) backbone at the management level. Some of the protocols at this level are BACnet web services, OPC, oBiX, Etc. Artificial Intelligence techniques increase the smartness of the building operations to reduce further both operation and maintenance cost while increasing the occupants comfort & safety.

Management frameworks

Modern BAS tends to separate the automation logic from the user interface through service-oriented interfaces which act as a communication gateway providing flexible access to many platforms like Computers, mobile etc. Service Management Frameworks for BAS ease the task of maintaining the system, because changes in the automation layer and field layer will not affect any of its interfaces, and interfaces can be created or modified without affecting the automation layer.

Challenges

Building Automation Systems are complex due to use of multiple technologies.

The existence of gaps in functionality interfaces of multi-vendor systems leads solution developers to repeatedly redefine basic concepts creating their solutions bottom up. An inclination to create custom solutions persists, which greatly explains the heterogeneous nature of BAS. Most solutions are not able to inter-operate with other vendors’ solutions without additional overheads. This results in satisfactory performance only in the exact conditions they were tailored for and lacking in flexibility in maintenance and upgradation. Many times, standard BA technology models are not able to fully cover the breath of functionality expected from BAS, and that distinct technologies are required in order to create a fully functional system. However, the interoperability of these technologies is hampered by the fact that, as we observe, a number of concepts cannot be mapped between them. As a direct consequence of this circumstance, manufacturers have been led to create their own proprietary extensions thereby exacerbating the proof of heterogeneity. Attempts are being made to resolve these issues.

Standards

ISO 16484-3 specifies the requirements for the overall functionality and engineering services to achieve building automation and control systems.

The European Standard EN 15232 was compiled in conjunction with the Europe-wide implementation of the directive for energy efficiency in buildings.

The ISA/IEC 62443 series of standards, developed by the ISA99 committee adopted globally by the International Electrotechnical Commission (IEC), addresses security vulnerabilities in industrial automation and control systems (IACS).

For feedback on this newsletter or writeup contributions or for improvement suggestions
Email to:
cpezantes@gmail.com or rathan@rsbizconsultant.com
From The President, ISA - Paul Gruhn

What ISA can do for you

ISA has both led and participated in a number of surveys over the last few years. One thing that really stood out for me is the significant differences between "active" versus "passive" (and non-) members. Their perceptions and desires from ISA differ.

Active members have a strong relationship with the Society; one driven by perceived value. They rate the Society’s products highly and perceive their membership to be a good value, and use many of our products and services. Their most preferred products are a) annual conferences, b) local meetings, and c) accreditation programs. ISA naturally offers all three, and much more.

Passive members (and non-members), on the other hand, have a weak relationship with the Society. They do not perceive membership to be a good value. They have low familiarity with our product range, do not see a benefit to it, and therefore have a low usage rate. I find that intriguing; some in the automation industry do see the value of what we offer and use our products, yet others members of the very same industry don’t, with many not even being aware of what we actually offer.

But here’s the really interesting part: passive members state that they have unfulfilled needs. They seek a competitive advantage and want support in achieving both their and their employers’ objectives. That’s exactly what ISA offers, yet they don’t seem to realize that!!

Here’s another similar example. An Executive Board member recently posed a question on the LinkedIn ISA forum. (It’s interesting to note the group has 57,000 members, which is many more members than ISA actually has. So apparently non-members do want to be associated with the Society in some manner!) That board member asked what people “want” from ISA. The vast majority of responses were asking for what the Society already offers, and has for a long time! How is it that these people are either unaware of what we offer, or are aware of what we offer, but don’t perceive any benefit? All the promotional material we’ve produced over the years lists what we offer (i.e., training, certifications, standards, publications, and conferences). Active members are able to connect the “what” to the “benefit” it offers both to them, as well as to their employer. They use our products and services as a result. Simply put, passive and non-members don’t make the connection, and therefore they don’t use our products and services. Yet our products and services are exactly what they’re asking for to make them and their employers more successful! We simply need to make the connection more obvious.

As an employee, are you looking to increase your technical knowledge and make yourself more valuable and competitive in the marketplace? Are you looking for a way to advance your career more quickly? Are you looking for ways to make your employer more successful? If so, ISA has just what you’re looking for!

As an employer, are you looking for a competitive advantage? Are you looking for a way to increase the competency of your employees, or a place to find competent prospects? Are you looking for a way to increase your operational excellence (e.g., safety, security, efficiency, profitability)? If so, ISA has just what you’re looking for!

And all this fits in perfectly with our new mission statement: Advance technical competence by connecting the automation community to achieve operational excellence. We’re advancing the technical competence of everyone in the industry (not just members) through publications, training, certifications, standards, and conferences. (We give our members extra benefits!) We do it to make people and their employers more successful. Who wouldn’t want to be a part of that?!

Oh, and, like all my predecessors, I’m honored to be your new Society President. I’ve been an active volunteer for 30 years and have served in essentially every area of the Society. I naturally would like to see the Society achieve certain goals over the next year, but those goals will need to be discussed and approved by the Executive Board at our first meeting in January, so I won’t announce them yet. Stay tuned!

Paul Gruhn PE, CFSE, and ISA Life Fellow, is a Global Functional Safety Consultant with aeSolutions, a process safety, cybersecurity and automation consulting firm. As a globally recognized expert in process safety and safety instrumented systems, Gruhn has played a pivotal role in developing ISA safety standards, training courses and publications. He serves as a Co-Chair and long-time member of the ISA 84 standard committee (on safety instrumented systems), and continues to develop and teach ISA courses on safety systems. He also developed the first commercial safety system modeling program. Gruhn has written two ISA textbooks, numerous chapters in other books and dozens of published articles. He earned a bachelor of science degree in mechanical engineering from Illinois Institute of Technology, is a licensed Professional Engineer (PE) in Texas, and both a Certified Functional Safety Expert (CFSE) and an ISA 84 Safety Instrumented Systems Expert.
From The Vice-President, of Industries & Sciences, ISA - Graham Nasby

Message to BAS Professionals

We as a society spend most of our time in buildings. Whether it is at work, at play, in the home, or at bedtime having somewhere that is clean, dry and comfortable is something that we take for granted. However, maintaining the indoor environment that we have all gotten used to does not come for free. To have a comfortable building requires a great deal of design effort, careful selection of products, construction, and then operation/maintenance. The operation of buildings represents a considerable investment in human capital and energy. Based on a recent study by the International Energy Agency, some 36% of all global final energy consumption is used by buildings and nearly 40% of total direct and indirect CO2 emissions can be attributed to buildings. And the energy demand from buildings and their construction continues to rise.

As Automation Professionals in the Building Automation field we have an important role of play when it comes to reducing the human capital energy footprint from buildings. If we can make building energy systems even 5% more efficient, the overall global impact on energy consumption and greenhouse gas production would be staggering. Even if reducing energy usage and CO2 is not your thing, investing in energy saving technologies on making the building as comfortable as possible for those inside. Automation, and more importantly the intelligent application of automation, is how we can accomplish these goals.

So do we do this? By encouraging the adoption of smart building technology that can ensure that the various subsystems of our buildings can work as efficiently as possible, and focus their energies on making the building as comfortable as possible for those inside. Automation, and more importantly the intelligent application of automation, is how we can accomplish these goals.

I will leave it up to all of you, as members of our ISA Building Automation Division and the greater building automation community, to help bring the benefits of applying this new technology to the building construction and management sector. Thank you for being part of the path forward!

New ISA Standards

ISA/IEC 62443-4-2-2018, Security for Industrial Automation and Control Systems: Technical Security Requirements for IACS Components, provides the cybersecurity technical requirements for components that make up an IACS, specifically the embedded devices, network components, host components and software applications. The standard sets forth security capabilities that enable a component to mitigate threats for a given security level without the assistance of compensating countermeasures.

The new standard follows the February 2018 publication of ISA/IEC 62443-4-1, Product Security Development Life-Cycle Requirements, which specifies process requirements for the secure development of products used in an IACS and defines a secure development life-cycle for developing and maintaining secure products. The life-cycle includes security requirements definition, secure design, secure implementation (including coding guidelines), verification and validation, defect management, patch management and product end-of-life. The ISA/IEC 62443 series of standards is developed by the ISA99 committee and adopted globally by the International Electrotechnical Commission (IEC). Previous standards in the series cover terminology, concepts, and models; establishment of an IACS security program; patch management; and system security requirements and security levels. All may be accessed at www.isa.org/findstandards.

Other ISA Standards News

ISA and The Open Group have agreed to a liaison Memorandum of Understanding to facilitate cooperation in advancing and harmonizing the development of a multivendor, interoperable, secure control architecture for application across the process industries. Activities will include sharing of best practices, document review, and joint forums.

The Open Group is an industry consortium of more than 625 companies and organizations that develops open, vendor-neutral technology standards, and certifications. The new liaison agreement pertains specifically to The Open Group Open Process Automation™ Forum (OPAF), which is focused on developing a standards-based, open, secure, interoperable process control architecture.

The widely used ISA/IEC enterprise-control system integration standards (ISA-95) and ISA/IEC 62443 standards (ISA-99) for the security of automation and control systems are key elements of the OPAF specifications. In addition, elements from ISA/IEC standards on alarm management (ISA-18), process safety (ISA-84), and batch process control (ISA-88) are being considered for inclusion as part of the OPAF specifications.

Graham Nasby, P.Eng, PMP, CAP has 15 years of experience working as an automation engineer and project manager for a variety of industries. His multi-company and multi-industry experience includes construction, pharmaceuticals, semiconductors, software, manufacturing, and the water sector. He currently holds the position of Water SCADA & Security Specialist at City of Guelph Water Services, a publicly-owned water utility located in Guelph, Ontario, Canada. Within the ISA, Graham is active on numerous standards committees and holds the elected position of Vice-President of Industries and Sciences. Contact: graham.nasby@guelph.ca
Building Automation System according to Wikipedia is:

“the automatic centralized control of a building's heating, ventilation and air conditioning, lighting and other systems through a building management system or building automation system (BAS). The objectives of building automation are improved occupant comfort, efficient operation of building systems, reduction in energy consumption and operating costs, and improved life cycle of utilities.”

New market research reports in the next three years foreseen the BAS market is expected to reach USD 99.11 Billion, this almost double the value this market had at 2016. This increase is driven by the demand for energy-efficient systems, growing need for the automation of security systems in buildings, and advancement of technologies as:

* Internet of Things: IoT;
* Robots;
* Virtual reality: VR;
* Artificial Intelligence: AI;

All this as part of the 4th Industrial revolution.

BAS is going to be part of our daily life not only at Commercial and Industrial level but at Residential communities & Smart buildings. Will not be too far when people will be driven to their job and their cars will be in direct contact with their job BAS system to find and guide their vehicles to a free parking lot, after parking and at the entrance a face recognition System will search in the BAS database to identify them and permit their entrance, with a kind greeting; in the way to their office doors and gates will open in front of them by the use of any biometric technology and always in connection to the BAS database to verify their access rights.

The lighting of the corridors will light up as they walk towards their offices maintaining a balance between use of utility or green energy sources not compromising their safety.

When they arrive at their office the temperature will be conditioned in the comfort zone and a computer will show the latest reports informing them visually and verbally about their tasks and meetings for the day and will allow to make web meetings using real-time connections of voice, video and data and holographic systems. This will be part of their day, while BAS continuously monitors, all the building supplies and systems as energy, access controls, HVAC, water, networking and always be alert for any emergency or safety in the building.

These are already some of the characteristics of a BAS for a commercial building. However the requirements for other sectors such as hospitals, industries, research centers and others are even greater considering the large number and diversity of variables to monitor and control.

The challenge for a Professional in the field of Building Automation is vast and varied, the very broad opportunities and the possibility of actively participating in the implementation and development of BAS is open.
Director – BASDIV : Rathan Bala

**Rathan Bala** has 40 years of experience managing in aerospace, building automation, and factory automation projects. His experience includes top management in business enterprises in small and large business units and has worked with internationally known management experts. He was Director – Consultant in BNI, a leading international business referrals organization. He is currently founder and Chief consultant of RS Biz consultant, LLC, USA - a business consulting firm specialized in manufacturing, engineering services, digital transformation, technology adoptions & growth strategy.

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Secretary – BASDIV : Ram Kerur

**Ram Kerur** has decades of experience in managing Industrial, Defense and Building Automation Products and Projects. Have worked at Siemens India Ltd for development of PLC and Drive Products. He has worked at Tata Institute of fundamental Research and a at top management of MNC Software Companies. Currently he is Managing Director of Sunlux Technovations Pvt Ltd engaged in Aero Space, Defense, Industrial and Building Automation Sectors.

Served as ISA Bangalore Section President for two terms and also as Student Liaison chair for 3 years. Currently one of the trust Member of ISA Bangalore Section and Immediate Past President.

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Country Liaison Representative BASDIV

**India** : S M Nayak

**S M Nayak** is having 25 years of rich Experience in Automation, Robotics & Engineering Services.

He has implemented Automation & Robotic projects in several Industries like Automobile, Railways, Heavy Fabrication, Batteries manufacturing, Aerospace & Buildings. Currently He is working as Asst. Vice President Engineering (Automation & Robotics) in Godrej & Boyce Mfg. Co Ltd, Mumbai, India.

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Membership Chair – BASDIV : John Lake

**John Lake** is the Director of Automation and Controls for DPR Construction, CA. John is a lifetime member of ISA and a Certified Automation Professional® (CAP®) and a USGBC® Leed Accredited Professional (LEED AP®). John has 35 years experience in the Process and Building Automation fields. John participates in technical committees of ISA as Subject Matter Expert. He is former CEO, Owner and Managing Director of a BAS Engineering and Control contracting company. Key member of a team that managed three large Biopharmaceutical projects that each earned the ISPE Facility of the Year Awards.

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Country Liaison Representative BASDIV

**Canada** : Dzhamshid Safin

**Dzhamshid Safin** has 11+ years of experience and 40+ completed Control and Automation projects in Oil&Gas, Construction and Building Automation industries. His experience includes design, programming, troubleshooting, project coordination and management. Currently works at Honeywell as a Control Systems designer.

He has a PMP certification and Ph.D. degree in Engineering. Joined ISA in 2015 and has been participating in Building Automation Systems Division activities since 2017.

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Standards & Practice – BASDIV : Noorul Hassan

**Noorul Hassan**, PEM has over 18 year of diverse experience in HVAC, Electrical and Building Automation system. He involved in wide variety of energy management, system optimization and building automation projects. He previously served as electrical design engineer for SKM equipment, Building Automation System Design Engineer for Sauter Middle east. Currently he is working as Building Automation System Service Engineer for Schneider Electric Building Australia. He is a Certified Professional Energy Manager (PEM).

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Newsletter Editor – BASDIV: Orlando Pezantes

**Orlando Pezantes** with an ASS Degree in Electronic and Specialization in Nuclear and Conventional Instrumentation and Control have a background of 30 years of experience in Automation and Control in the Industrial Commercial and Residential sectors like Manufacturing, Nuclear Research, BA and Military and now collaborating with the purpose of supporting the diffusion of technologies related to BAS.

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