

THE 5 VITAL ROLES

THE KEY
TEAM
MEMBERS
FOR SMART
BUILDING
PROGRAM
SUCCESS.

2023
EDITION

WRITTEN BY:



James Dice, PE, CEM, CMVP is the founder and CEO of Nexus Labs and has over 12 years of experience in the North American Smart Building Industry. James created and teaches the Nexus Foundations course, an unparalleled introduction to smart buildings.



Nexus Labs is a media and education company striving to create digital and decarbonized buildings. Starting in 2019, the Nexus community has grown rapidly and sees new members each month from across the industry. With regular gatherings and daily online discussions, players from organizations all around the world are working together towards digital, decarbonized buildings.



The 5 Vital Roles for Smarter Buildings

The key team members for smart building program success.

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Introduction

As we celebrated the holidays and started to wind down the year, the Nexus Labs team reflected on the progress in our industry in 2022.

One definite area of progress is defining the specialist roles needed to make smart buildings successful. More and more building owners are recognizing the importance of having specialist roles either on their staff or outsourced as members of their team of service providers.

This white paper summarizes the five vital roles that every smart building program needs on the team. We talk a lot about the flashy new technology required for smart buildings. But we must always remember that when we're changing how things are done, it's people that make it happen. Here are the five roles we're going to cover:

1. The Smart Building Champion
2. The Design Consultant
3. The Master Systems Integrator
4. The Network Manager
5. The Commissioning Agent

This version of this paper is just the beginning and your feedback can help take it to the next level. We'd love to hear from you: are you playing one of these roles? What are your keys for success?

Finally, this whitepaper is the perfect compliment to our whitepaper on the evolving technology stack for creating smarter buildings: Nexus Lore. Where this whitepaper covers humans and their roles, Nexus Lore covers the horizontal architecture that the humans are building together for each building and portfolio.

Let's jump in...

Role 1: The Smart Building Champion

Every team needs a team captain. We think of the Smart Building Champion like the captain of the team of teams that comes together for each building or portfolio.



The main thesis of our [Foundations Course](#) is that we need more champions at every position in the industry. People that understand how a smart building comes together, speak the language, and see things holistically. People who "get it". We've now leveled up over 350 people who can call themselves Smart Building Champions. But we still have a long way to go!

Since smart buildings are created by long term programs, not individual projects, it's particularly important for building owners to hire and support internal champions. They understand how the organization works, understand the financial decisions that are being made, and they have the authority or decision-making ability to drive the program forward.

They don't need to be the expert in everything, but they need to be able to collaborate with all their specialist providers to be able to deliver on the tech-driven outcomes their organization needs. Someone who understands how buildings operate, understands how to distinguish the nuances between different technologies and solutions, and then understands the financing and operations of buildings.

In soccer, James' favorite sport, the one who wears the captain's armband is the one that embodies the mindset of a champion. The type of team captain we need for creating a smart building is one that has a mindset of:

- Continuous learning & action
- Collaboration & leadership
- Meeting people where they're at
- Being the glue between stakeholders
- Holistic & long-term thinking

We see so many teams try to muscle through a project without a champion. If you watched the 2022 World Cup, it's like watching the US Men's National Team without Tyler Adams. If you're not a soccer fan, try this analogy: it's like watching the Chicago Bulls when Michael Jordan went and played baseball.

Let's agree: we need champions.

👉 Go deeper on the Smart Building Champion role:

- In [episode 51 of the Nexus Podcast](#), Rachel Kennedy and James discussed how we can all play the role no matter where we sit in the industry. [Check it out the 8 minute clip here.](#)
- Examples of internal champions on the podcast: [Tearle Whitson](#) and [Emmanuel Daniel](#) at Microsoft, [Ryan Knudson](#) at Macerich, [Tom Balme](#) at AMP Capital, [Thano Lambrinos](#) at Quadreal, [Bayron Pineda](#) at Kilroy Realty, [Rob Brimblecombe](#) at Monash University, [Ben Myers](#) and [Jim Whalen](#) at BXP, [Jon Clarke](#) at Dexu, [Jacinda Lofland](#) at Nuveen, [Shen Chiu](#) at Investa, and [Sabine Lam](#) at Google.
- Sign up for the [Foundations Course](#) waitlist.

Role 2: The Smart Building Design Consultant

The traditional design, construction, renovation, and operations processes weren't created with holistic technology strategy in mind. If these processes are carried out as "normal", then [we get silos](#).

Therefore, it's vital that someone takes responsibility for integrating technology into those processes. Someone must help the [Smart Building Champion](#) craft the smart building strategy and apply it to individual projects. That someone is the Design Consultant.

The team of teams needs a clear vision for how technology will achieve specific beneficial outcomes for its stakeholders. Crafting that vision requires:

- Engaging key stakeholders
- Defining the outcomes you're looking for from technology
- Defining use cases
- Assessing existing systems (as built or as designed by traditional design consultants)



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PART 2

THE DESIGN CONSULTANT



In our [Nexus Foundations course](#), we walk students through this process in the first few weeks. You'll notice it's first about human engagement before technology.

"My 80/20 rule is that it's 20% about technology—and there are a lot of technologies in a smart building. And it's 80% about people and human engineering."

—Bruce Duyshart on the Nexus Podcast

Then, when it's time to talk technology, the design consultant must champion the fundamental foundations of a smart building. They must define, educate, and sell the team of teams on the [horizontal architecture](#).

Next, the design consultant must take that vision and integrate it into those traditional processes, from conceptual design to detailed design, through construction to operation.

"We literally take the use cases and I embed them in the appropriate section of the spec. As in, in addition to the Division 25, which is the glue that would bring it together. Each contractor knows: these are your outcomes and these are the people you have to integrate with. And this is the manner in which I want information shared."

—Charlie Buscarino on The Nexus Podcast

Finally, this role is ultimately about addressing pushback and preempting issues. Changing the status quo is about change management, after all. The design consultant must field the

pushback and facilitate the process based on their prior experience solving these same problems.

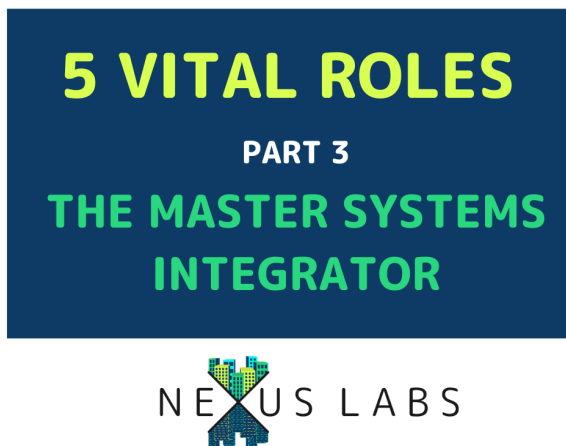
👉 Go deeper on the design consultant role:

- 🎧 [#032: Erik Ubels' insights from The Edge](#)
- 🎧 [#086: Building Science + Data Science = Zero Carbon Future](#)
- 🎧 [#115: The role of the smart building consultant with Bruce Duyshart](#)
- 🎧 [#116: Integrating "Smart" Into the Construction Process with Charlie Buscarino](#)
- Sign up for the [Foundations Course](#) waitlist to level up your design team

Role 3: The Master Systems Integrator (MSI)

The Design Consultant must help the Smart Building Champion craft the smart building strategy and apply it to individual projects. That takes care of the design phase—but what about contracting, construction, renovation and operations phases?

That's where the MSI comes in.



While there's no accreditation or certificate that makes you an MSI, the word "master" implies craftspeople who have proven their skills, plus breadth and depth of experience at their craft. It's akin to the other master trades. You wouldn't build a building without a master electrician, would you?

Unlike the work of master electricians, the work of the MSI is not standardized. Quite the opposite—it's more like the [“flex tape”](#) for connecting building technology in an industry that isn't set up to connect technology. As a result, the MSI needs to get involved as early as possible, supporting the Design Consultant in crafting the overall vision and strategy.

Once the design phase is finished, that's when the bulk of the MSI's work begins. They'll have technical oversight and involvement with the subsystem provider selections—taking a role of peer review over the proposed technology solutions for the project.

The MSI also acts as an independent reviewer of vendor pricing so the best value and outcome for the customer is achieved rather than the lowest or most “economical” price to meet specifications. Essentially, the MSI ensures that each piece of technology is conducive to the customer's vision and strategy.

As Mike Brooman told us on the Nexus podcast, the role has two main parts:

- **Technical**—Knowledge of siloed OT systems and IT networking, system automation and controls, data modeling, software applications, analytics, and support services. Deep understanding of the construction process and the ability to translate the design into practical reality. Integration skills to make everything work together.
- **Social**—MSIs are frequently described as the glue that binds everything together. The glue between each of the subcontractors to help them understand what is needed from each siloed technology. The understanding of user experience (UX) design and the ability to apply it to all the different user interfaces in the building.

Once the systems are in, the MSI works with the Commissioning Agent and Network Manager to ensure that systems are on the converged network, they're set up properly and securely, and communication/data is going where it needs to go, and all use cases that were designed by the Design Consultant are enabled.

Then, during the operations phase of the building, the MSI is responsible for managing changes and additions to the integrations and technology stack.

👉 Go deeper on the MSI role:

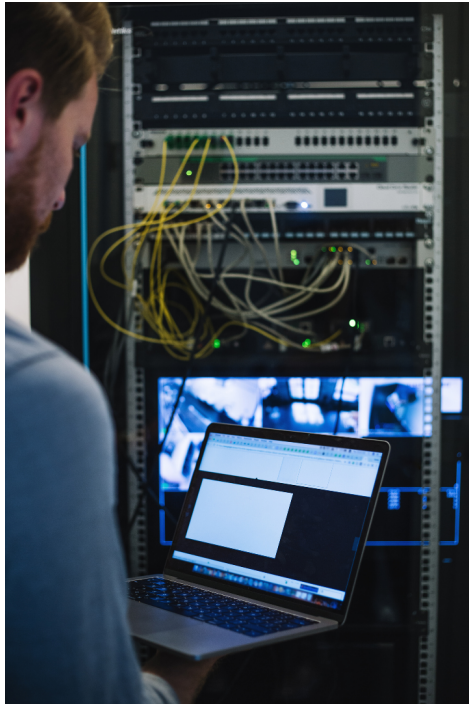
- [The evolving role of the master systems integrator](#) on The Nexus Podcast
- ["The MSI is a symptom, not the final solution"](#) with David Blanch
- [The 3 types of MSIs](#) in the marketplace today with Andrew Knueppel
- Sign up for the [Foundations Course](#) waitlist to level up your integration team

Role 4: The Network Manager

As we discussed in our [Nexus Lore](#) whitepaper, the [Network Layer](#) is a vital part of a smart building's infrastructure. It is:

...a dedicated layer with its own hardware, software, standard operating procedures, and key stakeholders who take responsibility for doing it right. It should be converged, monitored, maintained, and have redundancy.

Most buildings don't have today, do they? Most have a big hole we might call the IT/OT gap.



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PART 4

THE NETWORK MANAGER



There's the IT network or networks, some of which has smart building function and importance. IT teams generally have no understanding of/experience with networked building system protocols and communication methods. And we have this OT network or networks, that's in varying degrees of convergence onto a common internet protocol infrastructure. OT teams, meaning Engineering or FM or their vendors, have experience with BAS and related systems, but little understanding of/experience with enterprise networks and IoT.

Since all smart building use cases and outcomes rely on the resiliency of the building network, someone must take the responsibility for filling the IT/OT gap because a mutual understanding of both IT and OT systems is needed to manage the smart building network effectively. That someone is the Network Manager.

The Network Manager is responsible for the network infrastructure that connects:

- Each building system to itself (devices, workstations, servers)
- Building systems to each other
- Building systems to the cloud

Also critical, the Network Manager is responsible for maintaining, for all building systems, current documentation depicting:

- What is connected
- How it is connected
- Where it is located

While the Design Consultant is responsible for selling the teams of teams on the horizontal architecture and designing it, the Network Manager and the MSI are responsible for its execution. The Network Manager oversees the network infrastructure integration and the MSI works on top of that infrastructure to integrate the connected systems and/or aggregate data.

While the MSI is responsible for achieving the outcomes and use cases via integration, the Network Manager is responsible for ensuring that all physical connections are made, and data flows, according to the owner's standards, building codes, and cybersecurity industry standards.

However, even in a perfect world where the Smart Building Champion recognizes the importance of the Network Layer, the Design Consultant designs it, and the Network Manager and MSI ensure proper installation, we still need someone to manage that network during the Operational Phase.

“A building has an average of four technology-related moves, adds, and changes (MACs) per year (anything from a single security camera addition to a BAS upgrade).

The Network Manager ensures that these MACs are properly configured, connected to the network, and documented. And, a building has an average of four service tickets (questions, troubleshoots, outages) per year.

As the single point of contact, the Network Manager fields these requests, triages with building system vendors as needed, and solves them.”

—Joe Gaspardone, COO of Montgomery Technologies

And since most existing networks weren't built in a perfect world, they probably have a lot more issues than that, right? Most existing network layers [are in shambles](#). So we also need someone to help craft the owner's network standards and go out to each existing building to do the ugly, unappreciated work of upgrading existing network layers to meet those standards.

👉 Go deeper on the Network Manager role:

- [Nexus Lore: The Network Layer](#)
- [🎧 #027: Joe Gaspardone on how a base building network enables the smart building](#)
- [🎧 #052: Rob Huntington on the shift to Converged Networks, MSIs, and the "sun setting on the BMS"](#)
- Sign up for the [Foundations Course](#) waitlist to level up your IT or OT network teams and close the gap

Role 5: The Commissioning Agent

Even before you talk about smart building technology, today's buildings in general are only getting more complex. We need a coordinated and systematic approach to testing and verifying that all of a building's systems are working together properly. That's where the commissioning (Cx) agent comes in.



"There are literally millions upon millions of things that all have to go right in construction: to get the building to stand up, to get the windows to open and close, to make the heating and cooling systems perform, etc. The commissioning industry came about because there just needed to be some sort of quality control."

—Elliott Alvarez, Altura Associates

The Cx agent makes sure the building's systems and components are designed, installed, tested, and operated properly.

This includes:

- Working with the design team to develop a detailed plan for the building's systems and components. This plan includes specifications for each system, as well as performance and efficiency targets that the systems must meet.
- Coordinating with the contractors and other stakeholders to implement the plan.
- Conducting thorough inspections and tests of the systems, and verifying that they are working together effectively.

- Documenting and troubleshooting any issues that may arise during the commissioning process itself.
- Reviewing system performance and making recommendations for improving the performance and efficiency of the building's systems.

The commissioning agent and the MSI roles are complimentary. While the commissioning agent focuses on verifying that the systems are working properly, the MSI focuses on ensuring that they are integrated and can work together seamlessly.

Proper commissioning is vital for at least two major outcomes building owners need today: decarbonization and indoor air quality. By testing and verifying the performance of a building's systems, commissioning agents can identify opportunities to optimize HVAC systems and balance the competing demands of minimizing energy consumption and maximizing fresh air.

In other words, the commissioning process enables smart buildings. But it's also true that smart building technology enables better commissioning. In my opinion, analytics software **must** be used to supplement the commissioning agent's expertise and boots on the ground. Some common use cases include:

- Collecting and analyzing data from the building's systems to identify patterns and trends.
- Monitoring the building's systems in real-time to detect any problems or anomalies.
- Generating reports and visualizations that help commissioning agents communicate their findings and recommendations to the building's owner and other stakeholders.
- Automating functional testing to allow more equipment to be included in the scope and allow more testing.

And then once the commissioning process is complete, the analytics software should remain in place throughout the warranty period and the operations phase to supplement an ongoing, monitoring-based commissioning process.

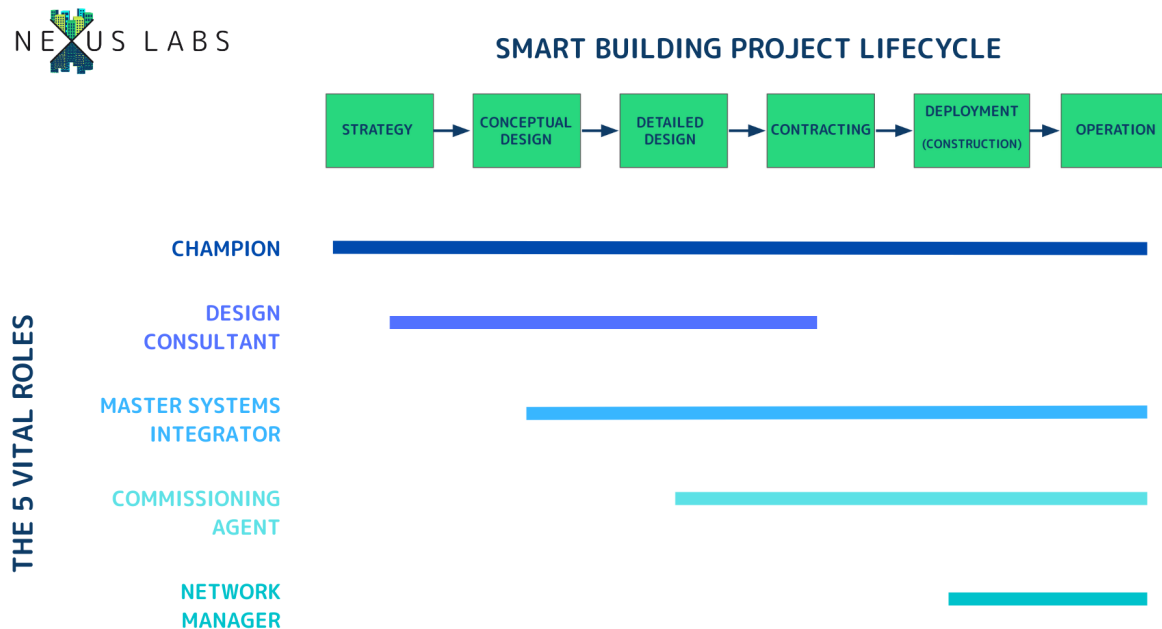
👉 Go deeper on the Commissioning Agent role:

- 🎧 [#088: From connected commissioning to connected construction](#) with this month's sponsor Altura
- 🎧 [#055: Ruairí Barnwell on designing and commissioning smart buildings and IAQ](#)
- 🎧 [#126: Decarbonization from the trenches](#)
- [How can analytics go mainstream?](#)

The Smart Building Lifecycle: When To Engage Each Role

All smart building programs are different, and procurement processes are no exception. Regardless of the processes used, the smart building program or project is going to have several major phases where things can potentially go wrong if the 5 Vital Roles aren't filled and engaged.

The following graphic outlines when each of the 5 Vital Roles should be involved across the smart building project lifecycle. In general, the industry needs to start getting these roles engaged earlier. Most projects go far too long without involving the right technology experts.



If you're interested in learning more about the smart building project lifecycle, check out the [Nexus Foundations Course](#).

Checklist: Filling The 5 Vital Roles On Your Team

In review, here's a handy checklist for finding the right people to fill these roles on your smart buildings team.

✓ Smart Building Champion Role Checklist:

- ☐ Champion mindset (see above)
- ☐ Vision for technology
- ☐ Influence to implement smart building program
- ☐ Technical understanding (IT and OT / building systems)
- ☐ Familiarity with current building operations
- ☐ Engages and educates other stakeholders
- ☐ Pulls stakeholders together, facilitates dialog

✓ Design Consultant Role Checklist:

- ☐ Champion mindset & ability to play Smart Building Champion role as consultant
- ☐ Deep technology expertise (IT and OT / building systems)
- ☐ Intimate understanding of the design & construction process
- ☐ Ability to write plans, specs, etc. for procuring smart building tech and work with traditional design professionals for integrating with their plans, specs, etc.
- ☐ Ideates and workshops technology use cases to improve users' workflows

✓ Master Systems Integrator Role Checklist:

- ☐ Champion mindset & ability to play Smart Building Champion role as contractor
- ☐ Knowledge of siloed OT systems and IT networking, system automation and controls, data modeling, software applications, analytics, and support services.
- ☐ Deep understanding of the construction process and the ability to translate the design into practical reality.
- ☐ Integration skills to make everything work together.
- ☐ Ability to coordinate with each of the subcontractors to help them understand what is needed from each siloed technology.
- ☐ The understanding of user experience (UX) design and the ability to apply it to all the different user interfaces in the building.

✓ Network Manager Role Checklist:

- ☐ Champion mindset & ability to play Smart Building Champion role as service provider
- ☐ Deep knowledge of IT and OT networks, including network design, wifi, network equipment, cybersecurity, operating systems, remote access, physical security, etc.
- ☐ Ability to manage moves/additions/changes of connected devices on the network.

- ☐ Ability to coordinate with each of the subcontractors to help them understand what is needed from each siloed technology that will use the network.

✓ Commissioning Agent Role Checklist:

- ☐ Champion mindset & ability to play Smart Building Champion role as service provider
 - ☐ Deep knowledge of building system (HVAC, lighting, etc) design and control strategies, energy efficiency, indoor air quality, and demand management.
 - ☐ Ability to translate the design into a practical commissioning plan and execute the plan.
 - ☐ Ability to manage issues log and work with the right stakeholders to get the issues resolved.
 - ☐ Skill set to deploy analytics software to supplement and enhance the commissioning process.
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As we conclude the 5 Vital Roles, we'd love to hear from you:

- What are the keys to playing each role?
- What do you see as the obstacles to success for these roles?

Let us know [on LinkedIn](#).