



CRE Tech Talks

Episode #4: Smart Buildings & the Internet of Things: Why You're Already More Connected Than You Realize, and Why That's Ok.



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Scott: Thank you again for that warm introduction and welcome to this episode of the CRE Tech Talks podcast. Again, I am your host, Scott Sidman. Today's topic is "Smart Buildings & the Internet of Things: Why You're Already More Connected Than You Realize, and Why That's Ok."

New operational technology more and often and heavily touted as a way to provide better service, lower costs, increased sustainability for your properties, but there seem to be a lot of risks involved with that, and the landscape is certainly confusing, so how do you make sense of it all?

In a bit of a change for these podcasts, for us anyway, we've got two terrific guests for us, with us today, industry veterans who are going to help answer those questions, maybe simplify things a bit, hopefully simplify things a bit, and explain maybe what you should really, really worry about.

Tom Shircliff and Rob Murchison, co-founders of Intelligent Buildings and recent award winners at the 2015 AHR Conference. Welcome, gentlemen.

Tom: Thank you. Thank you very much.

Scott: Great to have you both here. Since I mentioned the award, tell me a little bit about that, what that was for, and maybe give our listeners a bit of background on the both of you, and the firm, and how you started all this.

Tom: Maybe we'll take it in reverse order. As a company, we're a smart building consulting company. We focus on three main areas, and that's new project development, existing portfolio optimization, and then smart communities, and those consulting services range from strategy, to architecture, solution selection, program and project management.

We don't resell any products or services, hardware or software, so we're a services company. Thanks for noticing the award. It was called "The Petock Award," which is



named after industry pioneer Marc Petock, so it was particularly humbling to get an award in his name.

He's a friend, and really a legend, in the business, and it was for service and passion to the industry, so it's fun also to get that the "Controls Trends" event at the AHR Conference.

Scott: Terrific, and how did you both get started? How did Intelligent Buildings start? What are a little bit of your backgrounds?

Tom: That was a...

Rob: I'll start.

Tom: Yeah, Rob, you go ahead and tell us. It was a little bit of a "Two men in a truck" story.

Rob: I'm a self-professed technology nerd. I like everything that has to do with technology. About 12, 13 years ago, I start seeing that technology was going to impact what was going on in buildings. Tom and I had the opportunity to meet with each other, and Tom can give you a little bit about this background.

Tom: I had a little bit of technology, not as deep as Rob's, and also some construction and development, and it was really a coincidence that Rob came from the high tech angle, and I came from the real estate angle, and where those things were convergent, and we had a chance meeting, and really connected on our vision, and started from there.

We've been in business...we're celebrating our 10th year this year, so very exciting for us.

Scott: Much like two guys in a garage, two guys in a truck, it all works. Great business...

Tom: Yeah. There's a few more people in the garage now but it still feels fun.

Scott: That's great...

Rob: And a lot of lessons learned along the way.

Scott: Absolutely, yeah, for all of us in this space. This is a big topic, and we're going to do our best to narrow it down a little bit, but maybe we can start by defining in some broad terms Smart buildings and the Internet of Things, and their relationship to each other.

Rob: I'll take that if you want, Tom. I'd define the...IoT is really the third wave of information technology. The first wave that took place in the '60s and the '70s was just



taking manual processes, and automating those, and that was really about lease payments and CAD design on the back-end of operations and facilities.

That second wave of technology was enabling the integration between some devices that traditionally weren't digital, and that took place in the 1980s and the 1990s, and that was when we could automate sequences of operations inside of an HVAC system, so you could program the comfort level to be the same thing every day.

This third wave, the Internet of Things, which is, in a lot of ways, the playing out of the prolific Gordon Moore, who is the founder of Intel, and back in 1965 he said that technology was going to double in capabilities in every 18 months.

What that means today is that a PC in 2005, now the same capabilities can fit on a dime, literally a dime, and cost about the same amount, 10 cents, and this means that there's a lot more technology inside of buildings.

In a typical office building now you have a hundred thousand or more data points inside of that, and Smart Buildings is the practice of harvesting all that technology, all those data points that's in those buildings, and really driving better decision making.

I'll give you a mind-blowing number. By 2020 according to Intel, there will be 200 billion intelligent things, and a lot of those will be sitting in our buildings.

Scott: That's incredible. That's a really incredible stat, and the pace is really amazing. In just keeping it aligned with the things that are going on in the buildings, what are the primary operational areas of a property that are included in these technologies, in the services you provide, or in smart buildings in general?

Tom: It's funny. Rob talked about...and he touched on the back office in the beginning, and then the front-of-house control systems, and then personal technology with the PC.

You think about that range, and there's really almost nothing that is untouched in operational areas of real estate. The tenant experience, facility management, operational efficiency, even budgeting, capital expenditures, it's all impacted by those technologies.

Scott: When a customer comes to you, or a prospective customer, and talks to you about these things, or you're promoting them out in the marketplace, what are the primary benefits? What are the things that people are really hoping to achieve with these projects?

Rob: I'd say that the goals tend to fall into three categories. The first tends to be savings, those things that you can just do better during design, construction, operations in the building. The second category tends to be in sustainability. Really, that's the more efficient use of natural resources. The third is productivity and better experience for the building occupants.



In all three of those cases, a proper approach to organizing what's going on in a data-driven approach allows you to make quicker decisions in a faster pace, in a more productive way.

Tom: We'll touch on also, just throughout the call probably, but in real estate, and to emphasize what Rob's topics were, "Risk is king." Risk of not adopting fast enough, risk of exposure, that's always a theme as well. When you talk about benefits, that's one thing, but one of the big drivers is fear and risk.

Scott: Just a thought, back to Rob and some of those benefits you were talking about, those seem to be primarily internally driven. Do you get a sense at all in the marketplace that some of these are being driven by tenants and occupants as well? In terms of expectations for how buildings should function?

Rob: That's a great, great question because from an expectations standpoint, the vast majority of the occupants in a building today have smartphones, and they expect to interact, in a lot of ways, with their building in the same ways they interact with those smartphones, yet they don't have those capabilities because the average building is over 35, 40 years old.

What we are seeing is ways to start to bring this Internet of Things into existing buildings so that we can start to enable those experiences.

Quite frankly, in a new building, all the technology is there and it's possible, but there's eight-and-a-half billion square feet of commercial office space in North America, and the vast majority of that is 35-plus years old, and it doesn't have the capabilities that are required to meet those expectations.

Scott: But they're certainly eligible for retrofits, and upgrades, and all of the things that are available.

Rob: Absolutely.

Scott: Yeah, big market. Because I've heard you say this, and obviously I'm anticipating the answer, but why do you say that most buildings are actually already smarter and more connected than people realize?

Tom: It's maybe not that they're smarter, but maybe more that they're already high tech, and that's something I think people skip over when they're debating whether we should try to have a smart building approach or not. Whether they're going to have a smart building approach or not, they already have high tech buildings.

What we mean that is that if you've touched a building, or built a building, or even retrofitted a building in the past couple of decades just to have HVAC, and lighting, and elevators, and basic systems like the parking systems, each of those systems is built on computers and servers, local area networks, operating systems, protocols.



That's just the way they work out of the box, so when you step back, especially if you have a decent-sized portfolio, and look out, you have dozens or hundreds, and in some of our customers' cases, thousands, of these computer servers that are running your building, that are a couple of levels down with a vendor that you're not even aware of.

You have a lot of high tech that is both an opportunity. It's an opportunity because you have fairly capable systems that are usually not coordinated, but it's a risk because you're not considering all of them as a technology entity of architecture.

Scott: The logical follow-up there is if you're already connected in some way, how do you put some structure around that? Where do you begin with all the information that's out there?

Tom: That's usually an organizational issue because it just has not been addressed in a traditional real estate development and property management environment. It's usually pushed down to a vendor and just make it work.

A lot of times it starts with a real basic directional strategy and then some fairly basic organizational alignment around this fact, and once you recognize that...it's really interesting. Once we go through an education process with our client, and they just look at the facts, and even a little bit of inventory, all of a sudden everybody starts perking up and getting into the conversation.

Rob: It's also important, just in awareness, that technology alone is not the answer. A lot of times we'll go to our customers and they'll want to go talk about the technology, and the technology is very important, it's the driver, but it alone is not the answer.

Scott: Like most things, begin at the beginning and start to think about strategy and goals before you start thinking about the solutions.

Tom: Yeah, and it's not like...Rob's saying it's not...there's no such thing as a smart building widget you can buy, and just plug in, and watch it go. Real estate is very much an organizational-driven activity.

Scott: I know one of the things that I hear in the marketplace, and one of the things that might be holding people back a bit, is concerns about things like cyber security. We all heard about the target breach, for example, and the vulnerabilities of connected devices and getting things out there.

How do you answer that and how do you assess the risks in terms of outweighing the potential benefits?

Tom: I'll just make a quick point, just to re-emphasize, and then I'll let Rob answer your question about the risk. We talked earlier about how all of these control systems are built on computers, and local area network, and so forth.



Nearly all of them have remote access capabilities, so you can do software updates. They can do remote maintenance and configuration. It's very convenient and useful, and that had just sort of crept into our space.

Back to those hundreds of thousands of servers that are running our buildings, where most of them have remote access capability and almost no cyber policies associated with either the equipment or the vendors, that just sets up a little bit of the risk that we're in. I'll let Rob carry on about the type of risk.

Rob: It's important...one of the ways that we try to relate the risk to the organization is to bring examples that they know in real world, and they fall into two categories. One is what I would call nuisances, and that's similar to ISIS hacking the US Cyber Command, which was in the news a few months ago.

A more damaging type of risk that's associated is something that would actually stop operations, and the example many people know about is the Stuxnet virus, where Iran was hacked and it brought their nuclear production now. Inside of a building, those two types of things can happen.

A nuisance may be something appearing on a digital sign that is bad for your brand versus you have the opportunity...there's an opportunity through hacking to actually trap occupants in buildings, or in an elevator, and you have to figure out ways to address those types of things in the broader sense of things.

Scott: Those things seem to be the types of risk that we're aware of and that people can respond to and react. What would you say, for anybody considering these types of technologies in smart buildings, or are kind of held back from them, what are the real risks that they're facing if they don't move forward?

Tom: You make a good point, the risk if they don't move forward, because if you accept the fact that things have changed, and your buildings are full of technology, we're finding the risk of doing nothing is greater than the risk of being seemingly progressive.

The other thing is when you think about the cloud, and convergence, and these kind of things, you're having a conversation about IT issues, and there's a long, well-established IT industry and approach about cyber security, and reliability, and redundancy, and these kind of things.

What we're finding is that the conversation around smart buildings is elevating those topics, and making more reliable and more secure versus creating new vulnerabilities.

In the past, again, while we were taking on all of this information technology into our control systems, it's was happening without the conversation so we're finding that actually a smart building direction creates less risk.

Scott: It's better to get a handle on it and have a process related to everything you're doing rather than just let it happen.



Tom: Yeah. Being addressed versus not being addressed.

Scott: You mentioned vendors a couple of times, I think both of you have in this, and I'm curious within your customers, the work you do for your clients, has there been any kind of shift or change from the work you're doing, evaluating their own IT and what they own and control versus what they're now licensing and taking on from the vendors that they work with, in terms of evaluation of risk of the vendor technology stack?

Rob: When you look at the vendor technology stack, a lot of times what we see are two types of vendors. One is a vendor that has a deep domain expertise of the buildings system and what's going on. Another is a type of vendor that just...it comes from the IT space, and has the perception that they understand what's going on in the building, but they truly don't know what's going on.

When they come in there with their "Stack of technologies," what happens with the latter one that I was describing, of the traditional IT space, they come in there with a larger stack, or a larger toolset, of stuff that's needed to solve a problem that really isn't as complex as it needs to be if you understand the true subject matter expertise, true subject matter of what's going on in the building.

Scott: That makes a lot of sense. You talked earlier about the three primary benefits for these types of projects and investments. I know it's a very broad kind of answer that I'm asking for, but what do you see, or what are your clients looking for, in terms of their payback period for smart building technology?

Rob: I'd jump in and say that, first of all, if something costs less, which is what we've proven in design and implementation of newer systems, the ROI is infinite. If you can stall the systems in a converged way that allows for you to install those at a lower cost, why not do it that way?

That being said, once you have had that traditional...once you have these smarter, basic technologies in the building, you need a way of prioritizing the technologies that you're going to put into a facility, and what we have done, from an ROI perspective, is first look at those systems, which is an exercise we developed called "The Bullseye Exercise."

Look at those systems, what you're going to do anyway, your HVAC system, your lighting system, and those are the systems, as I described, that we focus on initially.

Once we have that framework in place, we can then look at systems that have a much friendlier ROI, if you will, because the infrastructure is already in place to connect them and to harvest that data, so you aren't looking at having to justify the ROI on the system all by itself. You're getting the vast majority of that cost has already been accounted for in those core systems.

You then...and that's more of a tangible term. The third category is that we then look at more of an experience approach, where the benefits are far less tangible, almost



intangible, sort of like marble in the lobby of an office, but they have a benefit from an experience perspective that allows the organization to do that justification.

Tom: I'll just echo that and say I it's a little bit of a disservice that the smart building concept is automatically associated with an ROI discussion, because we talked about risk, and Rob talked about getting your core systems in order, and there's even something simpler, like the Hippocratic Oath, "First do no harm."

You can get a little bit of a smarter building or portfolio by just realizing when you're buying something that's already been budgeted for, don't buy something proprietary, or closed, or not scalable. That's the Hippocratic Oath, that's a smart building, and that has nothing to do with an ROI.

Scott: That's a great example, great tip. Yeah, I totally relate to that.

You mentioned Moore's Law earlier, so tell me a little bit about where you think we are in the evolution of smart building technology and the adoption of those things, maybe a two-part question, then follow-up with talk about some of the interesting things you're working on now that might be a little different than they were a year or two ago.

Tom: I'll maybe let Rob talk technologically about it, but I'll just say in terms of the evolution in the marketplace, we're in a bit of a hype phase, and it's regrettable but unavoidable because there are lots of great solutions. There are a lot of great case studies. It's really, it's happening, and it's not vision or vaporware anymore.

Because of that, everybody says "They're smart," and everybody's got a PowerPoint to show you, and that's causing some confusion, and again, that's part of the natural process. What we hope that people do, it's a little self-serving, but get a guide, get some direction, and get some structure around your effort.

I say that because, so many times, otherwise very capable business-focused people we see are just stabbing at this, and they say even things like, "I've had 15 vendor presentations and I haven't seen it yet."

Scott: Wow.

Tom: Yeah. It's just hard to understand how they're searching for that. The quick reminder on that is that these folks have existing business real estate goals, and what we say about a smart building, it's not one particular system.

It is really just using technology to get to your existing goals faster and cheaper, and if it doesn't do that, then you need to move on to the next thing, because it's just that simple.

Scott: Great point, and Rob...

Rob: I'll add on from the perspective of really interesting things that we're working on. What you're ultimately trying to do is enable not just new processes, but new



experience, and a lot of the capabilities that we're not interjecting into these organizations, they fully haven't gotten their...fully aren't able to get their hands around, so I'll bring some examples of that up, and we classify those as use cases.

We like to go and name our use cases really cool names, and one of the cool use cases we have is Occupancy Aware, and the idea here is that the occupant now has some ability to not only have awareness of their environment, but they also have the ability to put those preferences around what they want back into the environment.

They now can take that information, and combine that with the Internet of Things, and inputs from lighting, and other systems back into that, and develop a new type of use case that wasn't possible without the Internet of Things.

Scott: That's really interesting. I like the naming convention there. That's terrific. Really good stuff here, but before we wrap up, for anyone who's considering undertaking a project, thinking about this stuff, we always like to give our listeners some takeaways.

What would be the five things you'd ask them to do or think about maybe before they came and spoke with someone like Intelligent Buildings?

Rob: Of the five...it's really hard to just focus on five things. I'd tend to put those more into categories. The first category, which we harped on a little bit earlier, was, "Do no harm."

When we were talking about technology, and the capabilities of what we can do, that there's really, to start out with, is you have the ability to just do things in a better way, not spending more money, but in the process, enabling you to now do things that you couldn't do before, as I spoke with the Occupancy Aware example earlier on. Tom?

Tom: The thing we want folks to really know and be aware of is that things have changed, and when there's change, it requires a response, or you continue to build up risk.

In real estate, you've got the risk of rising cost structures, cyber exposure, deteriorating experience, productivity loss, and even a competitive disadvantage, so that things have changed, it requires a response, and the risks are real.

Rob: I want to add to that last piece because the cyber risk is something that we feel is important, but we struggle with in communicating the message, because what we don't want to do is come across as a scare day tactic that if you don't do something, your building is going to be hacked and you're going to be the next Iran nuclear production facility hack.

But the reality is that we are living in this Internet of Things, like the 200 billion devices by 2020. Those devices are all connected, they are all little computers, and the reality is that the capability now exists for you to touch those devices, and organizations need to have an approach and a posture towards that, and we feel that that is extremely important.



Scott: That's great guidance, and if you just extend your personal life in the things we worry about in terms of security, and all of our connected devices, and instances, and our personal life, and extend that out to what happens in a...you can clearly see that it's going on, and it's something you need guidance on and to get a handle of, so better to do something.

Tom and Rob, really great insights. Thank you for spending this time with us today. Contact information for Intelligent Buildings and our guests is available on our podcast page along with a transcript of this recording. We'll also summarize some of their key points in a downloadable takeaway checklist for you.

I encourage you to reach out to Tom and Rob if you have a project you're considering or just looking for more insight into this really important topic. Thank you for joining us on this episode of CRE Tech Talks. I hope you continue to listen in.