ViZZ Technologies - Know It All

Episode 3 – With **Mitch Hughes** (Chairman of the Board of ViZZ Technologies) **and John Hester** (Owner and Chief Consultant of Hester Consulting, LLC).

Digital Twins, Smart Buildings, and AI are important topics when we think about the future of the construction industry. The latest episode of our Know It All podcast, titled **The Age of AI: Integrating People, Buildings, and Smart Cities,** dives into these new advancements and how they bring intelligence into our buildings.

While AI and Digital Twins provide the AEC industry with unrivaled access to data and insights to inform design and building management decisions, Smart Buildings help integrate all systems to communicate with each other and work together to operate a building.

Mitch Hughes, Chairman of the Board of ViZZ Technologies, and John Hester, Owner and Chief Consultant of Hester Consulting, LLC, discussed the impact of AI and Digital Twin technology on smart building systems, including Hester's work at 30 Hudson Yards in New York City.

As Hester explains in the episode, "My boss told me that we need to move into a building that's not obsolete by the time we get in. That was basically our marching orders, to have an innovative, state-of-the-art building that we were moving into and not something that was going to be old, as can happen in four or five years. So that was the start of it. And we delivered on that. We delivered one of the largest smart buildings, as far as I know, with several hundred thousand points over 12 disparate platforms that converge and work together to operate the building."

Read the full transcript below and explore key insights.

Episode 3: Mitch Hughes & John Hester

Mitch Hughes: Welcome to Know It All, a podcast for the AEC community.

Hello, my name is Mitch Hughes, and I am the founder and CEO of DSi-Digital, the authors of the ViZZ Technologies platform. Today, we will be speaking with John Hester of Hester Consulting. Before we get started, let me tell you a little bit about John's extensive career and why we feel so fortunate to have him with us today.

After 26 years of service, John recently retired as Executive Director of Global Building Engineering Services for Warner Medias Global Real Estate Team. Yes, this was formerly Time Warner. In this role, John provided strategic and technical direction for building engineering services across Warner Media's extensive portfolio.

Additionally, he leads Centers for Excellence, COE, and organization for best practices in a host of areas. This includes things like equipment maintenance, HVAC, critical systems, fire safety, life safety, utility operations, infrastructure – I could go on and on. For those of you in the building and facilities, engineering and management areas, this will be a particularly interesting topic, but for all of us, this will be an incredibly exciting discussion because where John has spent his career lays the foundation and continues to advance the integration between people, buildings, businesses, and smart cities.

Today's discussion touches all of our lives, especially as we enter the age of artificial intelligence and digital twins. Currently, John is the owner and chief consultant of Hester Consulting, LLC. They're located just north of Atlanta. So, it should be no surprise that Hester Consulting specializes in helping facility managers and other consulting firms and energy management, billing, operations, smart building applications and project management.

Let's start by touching on some of John's extensive experience so we can understand why I am so excited to have him with us today. So, John, tell me a little bit about some of the products that you've led and participate in. And first off, thank you for joining us.

John Hester: Thank you. It's really great to be here.

It's an honor to have this conversation and, of course, always fun just to have a conversation with you. Well, I wasn't born in media. I was lucky to participate in some really interesting, complex, and innovative projects. Some of those include the build-out, or the construction, of the Time Warner Center at Columbus Circle in 2001, and 30 Hudson Yards where Time Warner relocated their new headquarters to just last year, and several of the Turner Broadcasting buildings that were built in Midtown and downtown Atlanta. So, I've been really lucky to be a participant in broadcast-related and innovative projects around the country.

Hughes: You mentioned 30 Hudson yards. And for those of you that don't know anything about that project, or don't know much about it, I encourage you to go out and do some research on this project.

It is a truly amazing facility. John, the work you and your team did on that is nothing short of incredible. If you like to understand where our buildings are going today and how people in buildings can interact and benefit from them, this is a great project for you. Do you mind telling us a little bit about that job specifically, John?

Hester: Of course not. You know, that project, was really conceived back in 2014 or 2015, when Warner Media had the opportunity to consolidate all of its Manhattan properties into a single location. All our leases were coming up. We were occupying about 2.4 million square feet throughout Manhattan and the head of real estate decided it was an opportunity to consolidate in space and in the number of leases that we had. At the same time, our landlord at Time Warner Center was building this brand new, highly innovative, multi-building and multi-use development site, called Hudson Yards down near the Hudson River in Midtown Manhattan.

So, I guess we got an offer we couldn't refuse. My boss told me that we need to move into a building that's not obsolete by the time we get in. That was basically our marching orders, to have an innovative, state-of-the-art building that we were moving into and not something that was going to be old, as can happen in four or five years. So that was the start of it. And, we delivered on that. We delivered one of the largest smart buildings, as far as I know, with several hundred thousand points over 12 disparate platforms that converge and work together to operate the building.

Hughes: So, I should give everybody a heads up on our discussion. John and I have had dozens of discussions like this, where we talk about projects because I've been fortunate to know John and his wife, Lisa, for well over 20 years. In fact, we used to live pretty close to each other on the same street, literally.

So, we have sat on the back porch and in family rooms and in the midst of events where everybody else is talking socially about all types of things, and John and I are talking about where's the future of construction and intelligence and artificial intelligence and computer technology and control systems and building construction, and where it's going. So, we've had a lot of fun discussion around this. And frankly, some of that has led to the advances in the software we develop because we focus a lot on how we bring intelligence to buildings. So, you were talking about all the systems that are integrated in Hudson yards. Explain some of those and what you had to do to integrate.

Hester: We included in our integration, of course, your building automation system, your BMS, your lighting control, the power monitoring system. Hudson Yards was also the home of HBO and CNN in New York, so we had a lot of critical electrical infrastructure that had to be monitored and controlled, so that's part of the platform we integrated, the generator control.

We separately integrated the computer room, HVAC and power distribution systems. We didn't tie the computer room into the BMS but took their operating system and tied it directly into our master systems integrator.

We included the thermal monitoring of the electrical systems, a system of leak detection. I'm probably missing several more because there was about 10 or 12 systems by different manufacturers. All of our metering is tied in as a separate system into the smart building system.

And what we did is we integrated those into a common fault detection, diagnostics, analytics, kind of system or software that helps integrate and it helps these systems communicate with each other. And then it also delivers a single graphic system, a single pane of glass they like to call it, where you can be talking to any of these systems, but you don't know you're switching from one to the other.

As a matter of fact, we would overlay points from the different systems in a single graphic, so you can get a comprehensive picture of what you're looking at. You know, when you're looking at your graphics. Then, we leveraged data from one platform to another. For example, occupancy information from the lighting control system helped inform the HVAC system, like how many people were in the room. It also integrated with the AV system, which I didn't mention earlier. So, if there's a conference scheduled for a conference room, all the systems come up, HVAC system starts up, the lighting comes up. So, it was those kinds of integrations that were really interesting and fun to do that we were able to accomplish at Hudson.

Hughes: That's such a fun project. It's nice to see something done on such a large scale like that. For one thing, it impacts so many people. I mean, we talk about smart cities, a facility of that size is, by itself, a small city. It's such an impressive project.

As you know, we do a lot of work in digital twins. And for those of you unfamiliar with digital twins, basically it takes anything in the world and brings it into a computer, a digital replica. So, it's not just a physical representation. It can actually bring in historical data, like the entire background for the design of a building through current day and how people have interacted with facilities. And you can do that all the way up on a global scale, through smart cities and so forth.

You have both a physical representation that you can go through, like in gaming. I mean, you could walk through a building and digital version of it without being there for facility management and that type of thing. Were you able to incorporate any of that in 20 Hudson Yards? And, if not, where would you like to see that go?

Hester: That's an interesting question because even the terminology 'digital twins' is sometimes differently interpreted by different people. And lots of companies called what we did a 'digital twin' because we actually created graphics that duplicate what the building looks like in mostly a 2D situation, and then brought up all the digital information.

But, if you're talking about, a 3D model that has information on all the materials and each surface for each piece of equipment that's embedded, we didn't really do that yet. And I think that technology is here and it's going to be more prevalent as we go forward.

Certainly, I see digital twins contributing to building management in the future and not only for building operations and control, but for space planning, for capital planning. For 'what if' scenarios, you can actually simulate what would happen if you made this physical change in your space and what would happen from an energy standpoint, from an operation standpoint and use that intelligence to simulate situations that can help determine what kind of capital investment you make and find out how it works before you have to actually have to make the investment. Those are the right ways to use digital twins.

Hughes: Yeah, those are great ways to use digital twins. It's funny, I just did another podcast and I was doing research on digital twins and found out this interesting thing.

People think digital twins are a recent thing. They started in 2015 or so. That's really when we transitioned from BIM, building information modeling, to digital twins. And I found out the first successful use of a digital twin that was actually used in the real world not just, you know, speculation.

But it was actually used back in 1962 by NASA for the Apollo space mission. They actually did an entire digital twin of the Apollo spacecraft of every switch, every system, of everything on it. So, if something happened, they saw it happen on earth when it happened in space and it was that system that they could go in and manipulate.

They knew how much duct tape was left on the spaceship and how much hadn't been used. And that allowed them to problem-solve and then come up with solutions that brought the astronauts back safely when they had problems with their oxygen system. So, it's taken us a while, but you know, over 50 years later, we're finally starting to apply that technology to buildings and doing it on scale.

It's fun when somebody breaks a window and hits it with a baseball or something, and you can go in the equivalent of a gaming platform and touch that window and ask it who supplied the window, what size it is, what color, how many panes, all the information – all that data being collected in the building is just so valuable.

And, even in the systems you have, even though the digital twin is different on 30 Hudson Yards, you're using similar technologies from the air conditioning systems, the energy systems, the fire life safety systems, and so forth to integrate that. And you touched on how some of those can be used today. How do you see those going forward? Where do you see those going?

Hester: I think you're going to have the intelligence get better and the integration become easier. For this project, the integration wasn't an easy thing to do with different platforms that still have to communicate with it with kind of a middle hardware system. We had some challenges in making the systems talk to each other.

I think the first thing we're going to see is ease of integration. We're going to get closer and closer to plug and play. I think we're going to get less hardware that has to be used to help the systems talk to each other. And then you're going to have an explosion of data, of usable data that's available that's going to make what we're able to do today seem like a walk in the park.

So, I think we're going to go through two steps. One is to make the integration easier, and then you're going to have the artificial intelligence that's going to have even more data available in an explosion of use cases and opportunities for improving the user experience as much as anything else.

Hughes: Yeah. Data can be so overwhelming.

One of my partners Arol Wolford was one of the founders of Revit. He was in the group that started Revit. And so, at the same time, we were really developing BIM and we looked at all the advantages of having 3D models of buildings and that type of thing and collecting the data during the design process.

And what we didn't realize is that we were contributing to this disparity of knowledge that it used to be when you finished the design of your project, the trucks rolled up, you put all your drawings and all your documents and everything in the truck. And it went to the facility, and they put it in a plan room. Although it wasn't particularly efficient, it was very easy to get the information and how to describe to other people how to get to it, that the hanging files or the current drawings and the ones in the flat files or the revisions, the history of revisions and the specifications are over here, and your equipment manuals are over here.

Like I said, it's not that efficient, but at least you can put your hands on it. And, of course, the all-encompassing rule is that nothing leaves this room, so you make copies because you never want to lose the originals. That was one of the risks, but at least you could get to it.

And now what we've done with BIM is everybody's using different applications. They use AutoCAD, they use Revit, they use Navisworks, on and on. The poor owner and facility managers, you know, you send them a link, disc, USB or jump drive or something with tons of data created and dozens of programs and it's data overload. I mean, what owner knows how to get to that information, who knows how to run Navisworks, Revit, AutoCAD, and every other application that was used during the design process.

That's an area I'd really love to see building intelligence move. And that's what we're trying to do with ViZZ. How do you think it would help technologies?

I know we've had these discussions about digital twins and artificial intelligence and where it's going and actually touching our lives. How would you like to see that contribute to facilities like Hudson yards, whether they're massive facilities like that, or smaller facilities, as far as the human touch?

Hester: When I mentioned tenant experience and user experience, that's part of what I was talking about. And you kind of touched on a couple of different things. The ability to get that massive data that you're talking about that's now a data dump rather than a set of drawings. That, as you point out, is a really difficult thing to keep up because when we build these digital twins, keeping them up to date, I think is one of the greatest challenges.

As we do the renovations, as we make modifications to a building, then you have to go back and update the digital twin. And like you said that skillset isn't all available. So, I think the intelligence that's going to develop to make it easy is going to be one thing.

I think then the user experience is going to improve. Even now, you've got the capability of people in office spaces to use their iPhone to adjust the temperature in their space that the system knows where they're located in. If they're hot, it'll find out where they're at, and if they're sharing a space with multiple people, it can even do voting and averaging to what people want and make 90% of the people satisfied.

But I think it's going to be the step further. I mean, people are going to have the ability to just look at their iPhone or their badge or walk in the building and the elevator immediately comes to them, takes them to the floor without them pushing a button. If they're there after hours, for whatever reason, it'll turn on the lights and air conditioner. And when you leave, it'll do all the reverse.

So, it'll be energy efficient, very energy efficient, because it will only spend the energy necessary for the people that are there. It'll know where people are what their likes are. It might even be able to talk and ask if you want to order food from the cafeteria. I think those things that sound like the *2001: A Space Odyssey* movie from when we were growing up are not that far off.

Hughes: I have to admit, there are things about artificial intelligence that we are probably all afraid of. And we need to acknowledge that. Today, we all have to assume that our actions are being monitored and analyzed by computer systems. This could be scary for people in buildings, but in truth, what we're trying to do, and what we're striving to do, is improve the quality of life of people.

A computer doesn't have a conscience, so we tell it to do things and satisfy these needs. And it goes down that path, regardless of whether it's making good or bad moral decisions. Sometimes we don't understand the implications of it. But in building technology, to save energy and to have the building more comfortable for the user, it feels like there's so much less intrusion.

I think that's stepping into a smart city where the city, not just where you work, but where you live and the restaurants you go to and so forth, are starting to cater to the desires of the audience, of their customers.

Hester: Yeah. You're right.

It's kind of uncomfortable knowing that what you're saying is being heard. But if it knows what you don't like in terms of the temperature in your home or the lighting level, or whether you want your curtains open ord closed, it's kind of like having an automated servant catering to you and you don't have to say anything.

It might pour that bottle of wine for us too.

Hughes: Yeah. As you drive down your driveway, your garage door opens, your lights adjust, the thermostat goes down and that isn't tomorrow's technology. I mean, my home does a lot of those things right now.

But it's important to do that right at the beginning. And it's nice to do that on such a large scale because it gets complicated quickly. It's one thing adjusting the thermostat in the home. It's an entirely different thing adjusting a system that has hundreds of data points throughout a building and monitoring air quality and where people are and their activity level.

And that brings a level of sophistication and intelligence that really starts to change things. And it's an exciting technology.

Hester: Oh, it is. It's exciting and it's fun to be part of it now. And to, to make those things happen is a pretty rewarding, I think.

Hughes: You know, we have this saying in our company about the 2%. People don't realize it, but the average lifespan of a building, depending on the construction and location, is 60 to 120 years old.

But most of them are in that 80-to-120-year range. And, oddly enough, you would think wood-frame buildings don't last as long. In truth, wood-frame buildings are right up there at the same life expectancy before they're renovated or, I should say, before they were removed and replaced with something else, or hopefully it turned into a park.

But the design cycle and construction cycle of a building is only 2% of the entire life cycle of a building. I found this so interesting. If you think about it, it takes about two years to design and build a building from the time somebody says go to the time it's built now. Something as large as Hudson Yards, I imagine it took you a little longer.

Hester: Yeah. It was about a five-year process, I think, from the time that we talked about it and wanting to go, to the time that we moved in.

Hughes: So even with Hudson yards, a large-scale project like that, it's 5%, for a building that has a life cycle of a hundred years. So, you're only spending a small percent of the time on the design for how that building is going to be managed and operated for a hundred years.

This was the big surprise for me – the cost of operating the building, even if you take out the manpower, the people that are in the building itself, if you take all that out, the cost of operating and maintaining that facility far exceeds the cost of construction, very rapidly.

We spend so much time worrying about saving a few dollars here and there on what type of stairway we use, whether we use concrete treads or something else. Or whether we use fill or insulated blocks. All those types of decisions – we spend so much time on and really where it matters is the energy and the people cost and the low maintenance and having the information where people can get to it to know when their warranties are ending and when service is due so that a $10 repair doesn't turn into a $5,000 mediation.

Intelligence is changing so many things and it's such an exciting field. I also know that, I should mention, Congratulations. I remember you won some awards recently that I didn't say congratulations for, but John's really had an impressive history. I mean, even starting back in the late nineties.

So over 20 years ago, John was winning awards with ASHRAE. He was engineer of the year in Atlanta and more recently. You won? What, what was the award you won? And a few years ago?

Hester: Yeah. I was fortunate to be the AEE's International Air Energy Manager of the Year. That's probably the premier award that I was fortunate enough to win, a recognition from my peers of our energy management accomplishments at Turner Broadcasting at the time. So, yeah, that was a good one.

Hughes: You know, when your peers are saying you're the best in their industry, that's a pretty good pat on the back. Congratulations for that.

What brought you into this career? I mean, it started off one way and it's ended up going all the way to artificial intelligence and building systems, and we're talking about where it is today, but how did you get here?

Hester: Oh gosh, I don't think a podcast is long enough, but let me try. Like you mentioned, I started with Turner, which at the time back in '93 was not part of Time Warner back then, they just needed an engineer to help provide the mechanical /electrical coordination for their project and their project managers.

And somehow at some point, my boss said, I need some help with managing the energy. And he hands me all the binders with the history of utility bills. And he says, 'here, you take care of this. You make sure that we don't spend too much money on energy.' And I dug into that and it was successful.

And, you know, I did the things like meet your utility providers and get to know them, find out what's out there, that kind of thing. And then from there I was always kind of a geek. You know, I'm an engineer. And controls and digital stuff has always been kind of interesting. So, I made sure that I kept Turner on the leading edge of technology as far as building controls were concerned.

So, between that and energy management. We did some pretty innovative projects. We've put in a natural gas engine driven chiller at Turner that allowed us to use natural gas instead of electricity, which is cheaper to really save us on utility bills. Those kinds of big projects not only got me recognized but also gave me a bit of responsibility.

All of a sudden, here I am doing some big controls for a big project. So, it just kind of evolved, I think. Maybe I'm making this story too short. All of a sudden, I woke up and 26 years later here I am.

Hughes: So, John, was that project when you put the chiller in, was that the one that we went down and saw that huge helicopter come into Atlanta and put the chiller on top of the facility?

Hester: That was part of the project when we put the cooling tower for the chiller on the roof of the CNN Center. Helicopter lift was the only way to get the equipment there. And we had to shut down some roads in Atlanta on a Sunday morning. It was kind of fun, you know, doing a helicopter, I'd never done that before.

Hughes: That wasn't any normal helicopter.

Hester: No. That was a pretty heavy load that thing had to carry.

Hughes: It was like a crane. It had three blades on it. It was massive.

Hester: It was. It was massive. That was an interesting project.

Hughes: It felt like we were watching a science fiction movie. You're looking at that chiller hanging over your head, you know, it was quite impressive. Fun project. Well, what are you doing now at your consulting firm? Where are you specializing and spending your time?

Hester: I ended my career with that smart building system at Hudson Yards. And I have all these years of experience as an energy manager, so I'm trying to use that experience to help either other building owners or other consultants save energy, give them some guidance on the smart building landscape. As you and I both know, smart buildings are coming and more and more people are going to do it, they're going to have to do them to stay competitive.

You know, I had a lot of lessons learned in my smart building project, and I think I would be able to help owners avoid some of the mistakes I made and make some good decisions along the way as they implement this smart building.

Hughes: Well, I can tell you from personal experience, if you need somebody that is truly an expert in their field, if you want somebody that is fun to work with and enjoyable and knowledgeable, it's hard to do much better than John Hester.

He is the epitome of a professional and just a kind person to work with. Um, John, if people want to get in touch with you, how do they go about doing that?

Hester: Well, they can go to our website: www.hesterconsulting.net. They can email me at john.hester@hesterconsulting.net. Those are probably the two best ways to get ahold of me, or they can call you, Mitch, and you can tell them how to get ahold of me.

Hughes: That's true. Well, John, I so appreciate your time today. Is there anything you'd like to add before we wrap this?

Hester: First of all, thank you again for this opportunity. I'm really excited to be able to work with a good friend and a good person like Mitch.

I look forward to doing more things with you and with ViZZ, and I hope that we're both able to help a lot of folks out there that have these questions and need help in the smart building industry or in the energy industry.

Hughes: Well, John, thank you so much for your time today. It was a real pleasure, as always. And, join us again next time for another episode of Know It All.