Hello friends, welcome to the Nexus podcast. I'm your host, James Deiss. Each week I fire questions at the leaders of the smart buildings industry to try to figure out where we're headed and how we can get there faster without all the marketing fluff.

I'm pushing my learning to the limit and I'm so glad to have you here following along. This episode of the podcast is brought to you by Nexus Pro. Nexus Pro is an annual or monthly subscription where members get exclusive writing, podcasts, and invites to members only Zoom gatherings. You can find info on how to join and support the podcast at nexuslabs.online without further ado, please enjoy this episode of the Nexus podcast. Episode 54 is a conversation with Ben Birnbaum, partner at Keyframe Capital. This is a fascinating look inside the mind of a technology investor who's invested in several past Nexus podcast guests including Passive Logic, AquaCore, and Buildings IoT. We talked about what brought Ben into the building technology space, why he's here to stay even though he's learned about all the barriers, and what it takes to succeed as a founder in our space.

Without further ado, please enjoy Nexus podcast episode 54. Ben, welcome to the show. Can you introduce yourself? Hey, James. Thanks for having me on. I'm Ben Birnbaum. I'm a partner at Keyframe Capital.

Cool yeah, we got a lot to unpack today. Can you start by giving us a little bit about your background? How'd you get here? How did I get to this show? Or how did I get to Keyframe? Not like how'd you commute to the office today, but like how'd you get to working in this space? Maybe start by your educational background, that type of thing. That's too far to go back. And how I got to this show is too forward to go because I got a little worked up about building controls, which took me down an internet rabbit hole. And you were the only person I could find on the internet who was saying or doing anything about it a year ago.

You are still one of the few who still are, and that's how I got to the show. But a little bit about my background. I started my career working in a totally different space in education, actually. Always in corporate jobs. I've always been obsessed with how disruptive technology can be to legacy industry. And I started my career at McGraw Hill Education, focused on the change there was the growth of Amazon and the digitalization of education, which you're super familiar with as someone who runs an online course now. But there's a bunch of big textbook companies. And so my first job was working in corporate strategy as this big education company was a 125-year-old company. So I've always been focused on big incumbent industries. Was being transformed from what it had been, a big textbook publisher, to needing to become digital and facing this existential threat of Amazon.

And just all the breadth of corporate strategy work that I won't necessarily unpack because I don't know that's that relevant for today's topic. But that was what the beginning of my career was, which was super exciting and interesting. And it wasn't where I had decided to spend my career.

And I was looking for a similar experience in a different industry. And then I moved to a company with similar on paper characteristics called MV Transportation. That was similarly incumbent and around a couple of billion dollars in revenue, a big private company that is a transportation operator. And the businesses for folks who on this podcast who probably aren't familiar, like most of public transportation is outsourced. So the bus in whatever city you're in or the paratransit service, or if you live by water, a ferry or the rail crew or commuter services, or all of that is outsourced into 10 to 30-year contracts to large contractors that bring all of the technology, all of the capex, all of the labor, the insurance, everything into a giant package and sign a long-term contract. They're like big public processes.

They're not that different from the kinds of building service contracts that people sign for long-term HVAC maintenance and stuff like that, or an ESCO contract might be more of a comp. But anyways, I was looking for something that was similar, but in a totally new space so that I could get incumbent strategy experience in a space that had a new existential threat. And it was around 2015, 2016 when I was looking for that. And that was like the rise of Uber. And the company that I joined had the biggest paratransit business in the US. And people were asking them, is your business going to disappear because Uber exists? And it was honestly, it's a pretty valid question. So that's basically what I joined to work on was for the biggest paratransit business in the US. I joined as the head of strategy. What are we going to do about this? What actually the company did about it is now like when you order, I don't know if I should say it's on a podcast, but they won that battle.

They're doing just fine. And so I worked for a couple of years on figuring out how to maintain incumbency position there. But what I didn't really anticipate was I joined a big old company just with an interest in how technology was disrupting market structure.

What I could never have anticipated was transportation was going to become so cool. And I joined in 2016. There was no autonomous driving companies then.

And yeah, sure. Tesla was a company, but every single vehicle in the world wasn't going to be electric. And there wasn't a war between line versus bird on every corner in the country and like connected infrastructure and just, it became this space while I was there, while I was set a strategy that, that there was just like a crazy rush of venture capital and of, of auto OEMs trying to evolve themselves and of all kinds of strategics wanting to do really new and interesting things.

And I joined this company that was like really supposed to be, it was supposed to be very boring and it turned out to be like, so not boring. And, and that, that sort of, it, it, it put, it put me in a position where I was, I had worked on a very specific problem and then it, that morphed into, so we had this contract layer that I described the cities and that morphed into, we were like, when you, when a city hires you to do transit, that means you're the city's representative to get people safely and efficiently around, around the city and fulfill transit means fulfilling things like, like equity for the city and access and accessibility and stuff like that. And that contract layer means you owe the city those things over a 30 year period. You basically like you represent those values for the city, like between the city and the private sector and everyone who you source into those contracts for decades. And so if there's innovation in a city, that means the mayor's office and the department of transportation and the budget office and everybody looks to you and they say, okay, if there's an autonomous driving company in our city, like how are you going to ensure that there's accessibility, there's access, there's safety, there's sustainability.

Like how are you going to ensure that those things are happening in our city for the next three decades? And then are you, how are you going to do it and how are we going to pay for it? And like all of these like crazy complicated issues. And so it just, it became like, it just, it was such a blessing. It was like, I just got so lucky that I was out, I was not out looking for that, but it just came, it just became, you know, technology is it's everywhere.

It's like changing every space like that. But I was in a position where just so much technology was flying everywhere all at the same time. And so I just, and, and I don't know if I mentioned this, they operate over 200 and like around 250 contracts in the U S so like basically every major city in the U S. And so I was like, sometimes I was in four cities a week in a different DOT and just meeting with folks and hearing like, what are your goals? And then I was, and then I would go from hearing the city's goals to going to some tech company's office and just ping back and forth between the two. And so I got this super unique perspective on what is the, why does the public sector operate in the way that it does and how does it go about engaging with, with innovation and in a, in a way at a time period where other people were just trying to, you know, not necessarily respect the value of like the transit values that I described.

Anyways, that was my background. But when I, when I started to, it was, there was so much breath that of, of technology that when I started to understand the kind of infrastructure development that was going to go, that was going to need to happen to achieve the like infrastructure development goals across all types of municipalities, urban, suburban, and rural, just in transportation alone. But especially when you looked at vehicle electrification, like how that links to energy, even before I knew about the things that need to happen in buildings is like way before I knew anything about like building controls, HVAC and stuff like that.

It just became apparent that there was companies like mine, we're going to need a new kinds of finance. And that's what led me to where I am now. That's when I basically, I linked up with a couple of folks who are now partners of mine at Keyframe. One who was in a very similar position to mine at Rivian Automotive, who wasn't then, but is now a giant EV company. And another who was a career investor and operator in energy and transportation, who was, was seeing this change in infrastructure and was, we were, we didn't exactly plan on starting an investment firm at the time, but we were all just something, something's going to happen here and we should do something. And here we are. So that became Keyframe Capital.

That became a couple of things. All right and at what point, so one of the things that you and I met like a year ago, whenever you've searched on Google for people that talk about building controls, whenever that was you and I met, and since then I've learned that you are quite the connector, like you, you know, everyone and you're always connecting me with other people. And so I'm wondering at what point, how did you learn to do that? And why do you do that? How did I learn to do that? And why did I do that? I want to say thank you first, cause it's awesome. And so I say it in a, in a, in a praising way, how can other people learn to be like you? I liked the way that you phrased it before, because I'm not sure that anyone should be necessarily aspiring for, for the way that you phrased it the second time, but people could definitely be learning to, to, to network, which I do spend a lot of time on. And while you're thanking me, I'll thank you for deciding with, with limited plan, really to just start endlessly blogging and interviewing CEOs and, and starting a community focused on building controls because without it, I'm not really sure it would have been possible to figure out how to start investing in the space.

There's not really that much high quality information on the space out there, especially on the, especially on the real problems in the space. Sorry the questions were why and how did I learn and how, what should others do? I'm re I'm reframing your questions into ones that I feel like I can answer. How can people learn to be more like you? First of all, I'm a generalist as a person. I did, you asked my started me to start my education, which I didn't, but I like, I have a, you're an engineer. I don't normally say this out loud and we're on a recorded thing, but I'm at, I have an accounting degree.

I have a good reason for it, but I won't pour everyone with it. I've never worked as an accountant just while we're getting things on the record, but I'm a generalist. And one reason why is there's just no way I could have good conversations with specialists. I learned from them. That's one reason why the second is I think more, more in a broader sense than that careers are so complicated and, but they, and people are complicated and it's, we tell ourselves a lot of, a lot of complicated stories when we're alone by ourselves and things that don't make sense, but experience is just so insanely valuable. And most people are really excited to share their experience with others.

It's pretty fulfilling to share your experience with others and almost no one gets asked to share their experience with others. If you take a look at like almost anybody's career, most people only have, especially in the first decade of their career, two or three really high leverage moments that make a difference for the trajectory of their career. So figuring out how you can learn from the experiences that other people have had and lean into the right high leverage moments can just completely change the arc of your life. And I have no idea when I learned that, but since I learned that I have become an absolute addict of learning exactly when those moments were for other people. And honestly, not even just for like successful people in their career, but like happy people just where did that happen for you? You don't switch jobs often. You don't move many times.

You only make a couple of big decisions in your life. And if you boil it down to like decades, which is like the amount of time that I've been working. So anyways, I've just become like a total addict. The lessons that I have are like, I only connect with people on LinkedIn who I would expect if I asked them to connect with someone else, if I asked them to that's where my bar is. And then I offer that up to anyone that I connect with.

So if I am talking to a college senior and they're a high quality person, I can say to them, look through my LinkedIn. And if there's anyone you want to meet, no ask is too high or too many. Almost no one takes me up on that.

But for the people that do and they want to meet some CEO, I actually know that person. And most of the time that works out, that's probably my number one lesson for me is that that's where I keep my bar. The others are just normal human being stuff. I try to act, listen and learn because that really benefits me. And I try to connect people with like as much selflessness as possible. I think you probably don't give yourself enough credit here though, because like you started a giant community in a space that doesn't have a community.

And so you're probably a different LinkedIn philosophy. I connect with anyone so that they will see my posts. I want them to see my writing and hear the podcast more than I care about maintaining quality network.

Is that positively impacting your stats? Oh, absolutely. Yeah people hear the podcast and they're not necessarily reading my writing yet, but they'll come to LinkedIn to connect. And then the next Tuesday, when I write an essay they'll get a notification because we're now connected.

They'll see my writing. You're more likely to join the community from there. So I get it you just, you don't have the time to personally have a conversation with each of them. Nope but you could have the time to like automatically send them a note or something like that. Yeah i have a offline database of people that I meet with and connect with. And that's where I do my connecting rather than on LinkedIn.

Yeah i was thinking about this the other day. I feel like I don't feel nice about this, but I probably rejected like five times as many LinkedIn invites as I've, as I have accepted. It backfires on me because I accept every invite, but then someone will send me a message right after that. And I'm just like, I don't have time to respond to five messages a day.

So then I'm like being an asshole at the same time. Yeah it probably deserves a purpose for you, but you could never then use your LinkedIn network. Like how I use mine, which is, these are just actually people I know and yours is like, these are followers that I have. Social media is a tool. How are you going to use it? When you get a real job, if you ever get a real job, you'll just need to start fresh again.

I guess I'll just delete it and start over, but I'm pretty employable at this point. So before we get. Chris, you're a slave to the Nexus community. Yes yes i am at everyone's service. No one's service individually.

Before we get into buildings, you've had enough. The Nexus has become Nexus. Yes, I have you had an announcement last week about a new startup that you founded, which I didn't even know about. You guys were in stealth mode.

Can you talk about it? Can you tell us about it? Yeah, sure. It's actually an old startup, but that we founded that was in stealth mode for three years since the beginning of 2018. I'll speak about it briefly since it's a different space, but it is a infrastructure company that develops, owns, sort of operates and finances electric transportation infrastructure. Super briefly, as inspired by the career story that I told, I left the last company that I was at with the view that vehicles were all electrifying and there's, as probably resonates with a lot of folks who listen to this podcast, if you plug every vehicle in at say like a logistics hub, if it's electric, you will have sort of like peak load similar to skyscraper and those sites. But in addition to logistics hub, that's true for anywhere where concentrated electric vehicle charging is going to happen. So I'm not talking about fast charging sites, like a Tesla supercharger or something like that. I'm talking about a municipal transit hub, a fleet of Ubers, the post office, FedEx facility, things like this.

But we have in every municipality all around the country, there are thousands of these locations, truck stops, stuff like that. If you do that, you have a peak load that is similar to a skyscraper. And these locations were not cited for that kind of load.

And in the US alone, folks say estimate between one to $2 trillion of additional infrastructure development. And there aren't specialized asset owners for that. And I see this as the company that we've been building is a specialized asset owner for that. We've been for the past couple of years, acquiring property adjacent to these kinds of sites, as well as building the kinds of capabilities that a company like that will need. And the announcement that we made is we recently brought on as CEO, a woman named Neha Palmer, who was previously the head of energy for Google. She took Google from eight data centers to the juggernaut of an energy footprint that they are today, as well as being a net zero emissions. So I'm sure many people who listen to your podcast are very familiar with the energy hog that data centers are, but that asset class is actually super similar in giant load characteristics in a new place. And so I'll let that analogy complete itself.

Yeah, but that's the company. And so we're excited to have it finally something that we are not only talking privately about for the past three and a half years. Cool that's really exciting. And then somewhere along the way, we were a little nuts and apparently don't like to sleep. So somewhere along the way, we also started to fund. Okay so same people that you started key frame with, you also started terawatt with, and in the meantime, you just decided to start a fund.

That's very ambitious. So much of getting terawatt off the ground was a creativity and a realization of the need for asset financing and capital across the structure for physical infrastructure businesses of which everything in HVAC and controls is out in the physical world. So getting the business off the ground, the things that I described, a lot of that is about capital structuring. And so we were so focused on the capital structure side of getting the business off the ground.

And we were just very engaged with the market all along the way and pretty frustrated by what we were seeing as the failures, frankly, of capital markets in support of physical infrastructure companies. On one end of the barbell, you have the very blunt instrument of venture capital that is good in the spaces that it's good by SaaS companies or consumer companies that have a very specific margin profile. And in the spaces where it's not good, where businesses might have services or assets or something like that, so many businesses in the built environment like this, but businesses go to venture capital firms and say, I am an innovator. I am a startup. You're the person I'm supposed to go to to raise capital from. And they are told you don't fit my criteria. So instead of just building their business to meet their market and their customer requirements, they try to change their business to meet investor requirements.

And sometimes that's good. Like in the case of you're a SaaS company, yeah, there's a reason why venture capitalists have those requirements for SaaS companies. But like, if you are not, and you are a different kind of company because you operate in the physical infrastructure category, making sacrifices in your business model or sacrifices to your customer value just to meet the check boxes of capital markets is a failure that we couldn't let go. That's how we ended up starting a fund and probably how we'll end up doing everything we end up doing. We were very capital oriented in getting the terroir business off the ground. It's a capital oriented business. And then we were like businesses across all of physical infrastructure experience this need for more of a customer orientation.

And we felt like we should try to do something about it. So we built Keyframe as a fund that actually has the flexibility to be able to invest both in like normal venture capital stuff, which we do as well as on and off balance sheet, equity and debt. We just, we listened to businesses more about what is the optimal capital structure for them that we can like growth stage businesses, what's the optimal capital structure for them. And we can do things like project finance for earlier stage businesses because we have the flexibility that we have versus just you didn't meet the pre set criteria that I have.

So like change or leave. And that actually is on the other end of the barbell that is available to later stage companies. But that's available from, you know, Goldman Sachs when you're ready to go when you're a big company, but when you're a small company, you don't get to walk into Goldman Sachs and be like, bring me all of your tools and do something custom for me. They don't care.

So then when you guys decided, Hey, we're going to invest across the entire infrastructure stack or all these different verticals, you're the one that drew the straw for buildings or how did that work? Yeah, that's a great question. It was a complete accident. I'm pretty sure I still regret it. I don't know it's a fascinating space. It's still a, it's still a market. You can't even, it's still a market that I can't name. You can't even name it. No one could really name it. I used to call it energy efficiency.

It's not right. Cause it's really, there's operational efficiency is 10 times larger than energy efficiency. So we had invested in this company called Wonder Capital and we'd work there, a FinTech company in your neck of the woods in commercial solar. They do a very short story, financial products and solar are weird and they require FinTech.

That's the shortest I can tell that story. And so we worked with them on an equity investment and a debt investment, Googleable, if anyone's interested. So there are companies that work in the built environment that do something similar for energy efficiency. And so we thought, Oh, that, that's easy. Let's do that again.

What we just did in the commercial solar space, but in the commercial building space for energy efficiency. If anyone's listening and you do this, I want to meet you if I haven't met you, but there's going to be a hundred more companies that do this. Everyone knows we haven't tapped this yet. And I'll explain why we haven't tapped this yet.

And this is why I'm still here. We were like, okay, so, you know, it's going to be easy, but then you find out you get on the FinTech side of things, the commercial real estate market is so large, but it's also the depth and fragmentation of the market is hard. And it's not just because of the customer type being corporates and whatever else, like you can underwrite those things. All of the various types of contractors all the way through are weird and multifaceted and fragmented.

And in every type of building system that touches operational efficiency, HVAC controls energy and all the other major food groups of building systems, you have different types of general and mechanical contractors and then specialized contractors, which is obviously not stuff that I knew at the time, but stuff that I know now. Anyway, so we had started there and we were like, oh, we'll just do that thing. And then we started digging deeper on just like solutions that, but we were really focused on asset financing of energy efficiency related projects, which I still think is one element of Holy grail opportunity.

The other to me it's like non-cap X energy reduction solutions. And so you have a bunch of those out there as well, but how I got specifically to HVAC and the controls is we were very much looking for, okay, so there's this big energy opportunity. Like buildings are something like 40% of the emissions footprint. And there's all these reasons why people are excited for that to go down and operational savings and good payback of lowering that. And so if you could just implement a solution that lowers that clearly, obviously it makes sense to implement that solution. And so we started looking at all the solutions that you could do that with. And I started understanding why none of those solutions have grown. And there have been many of those solutions that have had really great technology to be able to identify how you would go about making a building more energy efficient with software. If it's controls were capable of doing so that is when I basically found your website. And that's around the time also when I met Troy Harvey from passive logic, but that's when I came across the fact that black box solutions, algorithms for lowering energy efficiency, tenant comfort stuff, anything related to machine learning or AI buildings, you name it.

Basically all of it's a lie, less building controls are fixed, which I believe that is possible. And I believe obviously we're invested behind it. I haven't really spoken about our investments, but that to me is the other sort of Holy grail. So that's how we got here is like we were focused on the flexibility of our firm is going to enable this massive retrofit opportunity, or it might enable people to implement this like zero cost down energy savings.

But then I realized there's no point if buildings don't have the infrastructure in place for that. Now I've been cursed with knowing all of you people and all the things I know about all the companies that put us in this God forsaken situation over the last couple of decades, but I'm hopeful that we're going to get out of it and they'll see their reckoning. Well, I love that you now call it like you're using the we term.

It's our problem. I'm in yeah, I'm in i'm literally and figuratively in. Yeah so talk about your, your guys' investments. You guys have made quite a few investments in a short amount of time. Can you, what can you share? Yeah, for sure.

It feels like a long amount of time, but it has been less than a year. I'll talk about how we view the landscape and perhaps because we're investing across the landscape and, and what we believe to be the market structure of the future. So we, I think those were like, I pointed out what I think is like the Holy grail, which is there's actually a third element that I'm not aware of, but which is like those, those two, those two types of opportunities. But I don't, I just don't think we can get there until we have a better infrastructure in place in buildings. So we're kind of being patient and investing in that, that type of infrastructure. So where we are invested so far are in passive logic, which is in like a open architecture controller. I feel insufficient to describe that to your listeners, but we need open architecture and for data to be able to flow in both directions in this space. And without that, we're just, we're not going to be able to process anything that looks, I don't even know that we really need machine learning or in buildings, but that's a different, that's a different question, but we need to be able to do more than today's sequential controllers can do for us. And we certainly don't, we just, we can't, we aren't going to be able to survive on the amount of labor that goes into programming controllers.

And so if only we just make them capable of, of being able to be programmed the way that they should be able to be programmed. We achieve a lot. We are investors in AquaCore. They are a fault detection and analytics platform. They're also very focused.

I would say their, their main focus is on, is on workflow tools and reporting to aligned stakeholders around specific outcomes, whether it be projects or reporting and they work with many large portfolio clients. I think I'm listing things chronologically here. Turn Tide this is probably an example for us of what's possible when you have the ability to, to plug and play their, their software controlled motor. You can do, they're just like retrofitting motors, a lot of rooftop, a lot of building efficiency, a lot of rooftop units, but all across the building landscape, doing a lot of interesting things. But this is, I think, example, example for us of across hardware and components where you make it seamless for the customer base to be able to swap things out without the, all the complexity of the way that, you know, an Esco might go in and complexify things, or I don't want to use the big company's names, but the big companies might go in and complexify things. Like we're just, we're just saying like for like units that just operate better at a cheaper price. So anyways, this is Turn Tide Technologies and then latest investment of building IoT that I think represents two different pieces, which I think one is a critical piece of technology.

And the other to me is like one of, is like this third Holy Grail type of opportunity. The first is data, interoperability, but they have incredibly powerful technology for, for data interoperability across a system type and it's open source. And I think that has giant potential to, to shift the landscape. They historically were a controls contractor, but they, their business model has, has shifted to turnkey contracting for like monitoring and predictive maintenance and ongoing related services.

And to me, that is the third sort of Holy Grail opportunity that I think just changes this space and basically breaks the market open. Once we have the quality of controls in place that we need to be able to have high quality data and we have interoperability of that data, then we can actually start to implement the energy solutions and whether they're zero cost energy solutions or CapEx related energy solutions, those are just different sides of the same coin to me. But what I think is also apparent is no one works at a real estate company that knows what to do with any of the technologies that we're talking about. And so it's not that I believe that a, like the HVAC services companies need to go away.

It's just a new kind of complimentary services company also needs to exist and one doesn't. And so that a third element, I don't know why I've started calling them. I've made a lot of biblical references over the past like 20 minutes. So I think I threatened some of the big companies with some they'll have their day of reckoning too.

I apologize to them for that. Maybe I don't, but I haven't had turntide on the show yet, but I've had, you mentioned passive logic, Troy Harvey was episode five, Logan Sawyer for Opcor was episode 18 and then Brian Turner, Bill anxiety was episode 34. And then we've talked about master systems integrators and that type of services firm on six different podcasts.

So I think you and I see along the same lines and a lot of different ways here. Hey guys, just another quick note from our sponsor Nexus Labs, and then we'll get back to the show. This episode is brought to you by Nexus Foundations, our introductory course on the smart buildings industry. If you're new to the industry, this course is for you. If you're an industry vet, but want to understand how technology is changing things, this course is also for you. The alumni are raving about the content, which they say pulls it all together. And they also loved getting to meet the other students on the weekly zoom calls in the private chat room.

You can find out more about the course at courses.nexuslabs nline all right, back to the interview. We'll have to check the dates of our investments to see if they were made before or after your podcast. I got to start getting some cuts on some of these deals.

You should be demanding. You should be reaching out to the whole investment community. People reach out to me and they're like, where am I supposed to learn about the space? And I'm like, I just send them the link to your podcast. And I'm like, don't talk to me about this space or ask me questions about it until you've listened to this guy's podcast. Because anything I tell you, I'm just going to repeat things that I hear on James' podcast. Thank you for show me you're serious by quoting James Dice to me. You are among my number one salespeople. So I appreciate it. Yeah, I'm the one who should be asking for a commission here.

Selling the free podcast. Anyway, so how do you think about. So you mentioned all the reasons not to invest in this space, right? Incumbents, split incentives, fragmentation, you said all those things. What makes you confident that all of that's going to. I mean, it sounds like it goes back several years in your career, several jobs, but what makes you think that all of that is going to unwind itself eventually? Yeah. Yeah the incumbents are agreeing that it's going to unwind itself with their actions. You seen Honeywell drop Forge and Open Blue is out there and I don't track everything that the incumbents are doing, but they kind of.

It's kind of a writing on the wall situation, I think, for the incumbents. And so I don't necessarily feel alone in thesis here. I think what I do feel alone in is there are a ton of people who are not really focused on the controls side of the space, who really invest in the energy stuff. And I don't think that the control solutions and the analytics and the services marketplace and the retrofitting offers or the utility programs or things like that are mature enough necessarily yet to support the kind of scale of the things that I was calling Holy Grail before. So I think there still might be some maturity of the part of the space that the Nexus is really focused on before the world can see the kind of results that it's asking for. If you think about the Biden infrastructure bill and what they might want out of the built environments and emissions reductions, it's cool, but we got to implement new control systems in lots of buildings before we can start implementing these energy savings programs and stuff like that. And so I just think anyways, but focusing on controls specifically. Yeah ditto for grid interactive buildings and a lot of the stuff that's coming out of the lab, solving controls. We're not going to solve climate change without solving controls. 100% yeah yeah, exactly so same thing is true of demand response. And that's what you have like grid controls. You're not doing that with buildings and doing it in a way that doesn't screw up all of the underlying building systems.

Maybe you are for some, but you're not doing that at like massive scale. And I think there's a little bit of talking past one another there by various stakeholders. But the reason why I think that this is happening now is like specifically now is the sort of the real estate operators I feel have been lied to about the ease of the economic opportunity that has been available to them for the last, I don't know how long they've been lied to, but they've been lied to for a period of time. And for the last decade or so there has been resistance to giving them their data. And that's what this whole open data interoperable data standards thing has been about in my opinion. And the reason why Forge and OpenBlue are things now is because you have a list of analytics companies on your site. Your list is not even comprehensive because it probably got boring to keep building a list. There are, I don't know, there might be a thousand building analytics companies.

There might be more honestly, like globally there's definitely more. And if Honeywell was there, you know, you guys said it, if Honeywell was giving building owners their data, there would not be a thousand building analytics companies like no way, but they weren't, no one was giving building owners their data. But for some reason, a lot of people felt the need to start analytics companies to just get data out of buildings and into the hands of building owners. And so, because the people that otherwise had that data weren't doing it. And that's been happening for the last decade. And every single one of those companies value propositions are based on the fact that data says there are operationally efficient things to do with positive economics in your building.

Every single one. Some of them also say, and it's good for the environment, or you should also buy our hardware product. But literally every single one is like, based on the data that we have, you can save money today.

And like the existing companies that serve them didn't tell them that. So I think there's this moment where maybe somebody already knew that, like maybe like the building engineer knew that or the chief building engineer. I don't even know if that's a job title.

Is that a job title? Yeah, pretty much. Sure yeah all right whatever the leader of the building engineers, some people probably knew that, but it's hard. You know, building systems, those are hard. They're made harder because the service providers have not invested in the kinds of things that they could invest in on the technology side. From my understanding, I have not known a lot about this space for more than like 12, 18 months, but from my understanding, people have been asking for updates to the big controllers, architecture and software products for two decades and haven't been getting them.

And they're like, we want to be able to do things better. And that has led to companies outside of them, like Skyspark existing and to be able to be built on top of them. That's led to the existence of a master systems integrator when that could have just existed inside of a product.

And so just product development has never happened. But we're at this point where like cats out of the bag, they've got all customers have data. And I'm not saying that there is, aren't impressive things to make building systems operate the way that they do, but there's a much wider stakeholder base now that is like, Oh, I better understand the economic opportunity.

That's not why I think that now is the time, but I think that is like a lot of kindling for a fire. That's what I would call like up to 2018, 2019, and then 19, 2020, and certainly increasing, you know, the customer is an investor. They're an asset owner. And so the way that their business works is they raise capital from banks or other capital markets and they buy assets and they get loans against those assets. That's generally the way that real estate works.

And then the people that work for them, fill them with tenants and manage the buildings. They have NOI in the last two years, we have seen a shift in capital markets and this is only increasing all across capital markets. Like financial institutions are meeting certain ESG characteristics. They are getting their funds pulled or they're getting penalized for not doing so.

That comes from the people that give them their money, like LPs, like big endowments and pensions and folks like that who manage the hundreds of billions of dollars that move our financial markets. So like you have folks who now can't access capital markets. You want to buy a new office building. You need to go and raise that capital and then go to the bank. You need to raise your equity, go buy that office building, be able to develop it. At the same time as you have this increasing awareness of projects that you could get done, which could increase your NOI, but you have other things that can increase your NOI that might be less of a pain in the ass. Like maybe you'll just increase rent by 1% and you don't have to figure out what's going on in the boiler room. But you have an increasing awareness of what's going on and the opportunity that you have. And then you have a lender presentation coming up and they're like, if you aren't showing me what you're doing to reduce your carbon footprint, my committee says I can't give you a loan.

And that's really happening. And in a whole other pocket of the world, you have utility rebate programs. Maybe you have a national infrastructure bill. I don't think those things are really necessary because the economics have always existed, but they drive it a little bit more of a narrative.

You have things like local law 97 in New York on the negative side, really harsh if you are not compliant with it. So I think it's those things. I think the economics have always existed, but if we go to this place where you can't do your core business anymore, unless you show your results, then I think that's where the market goes from a nice to have to a need to have. We're so excited about it because the economics, they have made sense for a really long time. Like it's made sense to upgrade your controls. It probably has made sense to upgrade your controls like for as long as there's been controls. That's probably always, I actually don't even, I'm now I'm just making stuff up, but I'm further back in history than I'm aware of.

But like when Tridium started as a company, like that was probably their pitch then. Right oh yeah before that yeah even before that, all the, all the energy engineers out there are sitting there going, I am confident I could find a stream of energy savings with good controls in almost every building that any of us ever touched. Yes yeah like you could show up at any building and even an efficient one and be like, I can find some amount of savings to sell you. I don't know if that's a hundred percent true, but you know, it's part of why I moved on like from going into buildings because it was like smarter about going into this building and finding energy conservation measures.

I need to get smarter about all the reasons why they're here showing up in the first place and no one can seem to get them implemented. That's why I had to kind of move on. Yeah well, that's fascinating. I'm wondering, do you agree with what I just said? Yeah. Yeah well, I'm wondering like most of what you just said was focused on bigger office buildings in that whole market and maybe even smaller office buildings as well. But how do you think about all the companies that you've invested in? Obviously maybe not AquaCore, but the other companies you named they're, they're hitting every vertical.

They're hitting K 12. If you want to put a turn tide motor into a rooftop unit, you can do that at a Walmart or you can do that at any buildings. How do you think about the other verticals and is there a why now reason for them as well? That's a great question. Is, is there a reason that office buildings are leading and they're going to pull the rest of the markets along? Is that what you think? I don't necessarily think about it that way, but I think this is an important question to answer. Full disclosure, James is working on a white paper on this for a key frame, but, but I, I is still focused on office buildings a little bit. It's I think it's focused on office for the ability to have some amount of scope, but I think about it more like larger buildings have more square footage and generally more ability to cut operational costs and the ability to, it seems the ability to sell to them for solutions oriented companies is just higher value. And so just the payback is there when there's more square feet and when there's more energy intensity.

But if you look at a building like a warehouse, like that's a very large building with a very low energy intensity. And so that's not always true. Yeah yeah so of course there are exceptions. I just, and I think as you, you go to smaller and smaller buildings, primarily I'm excited about the results of the white paper, but I just, I think market penetration is not very high yet. And so because the problem hasn't been, for example, retail can be just as large, not larger than office. So, but market penetration is not very high yet. And so the market is focused on larger buildings because the value proposition connects more.

And so projects are customers are probably more profitable. And I'm just, I'm not sure what it's going to take to get to the long tail of buildings. Like right now, the solutions companies are, are pretty fragmented in what they provide.

Even the way that you categorize them is just generally pretty fragmented. And I just don't see how that works. Like I just don't see, I understand how that works for a large building, but honestly, even for a large building, like who wants to deal with so many different kinds of solutions because the pitch is always the same. The solution is just different. And so it was just a different part of the solution. And then you got to figure out how it all gets integrated together. And so I think as we think about smaller and smaller buildings, it's like, we need more, something that's more coordinated. I don't exactly know what that is. Yeah yeah the way I think about all the different verticals besides offices, is it the same like strata technology strategies and technologies really they fly across all of them.

It's just that each vertical needs its own like special touch. Like you, you mentioned all of the factors and external things happening in the office space. That similar, some similar set of confluence of drivers is happening in healthcare and it's happening in retail and it's happening in higher ed, like think about higher ed.

That's a huge one. So all of those things are happening. It's just that technology extends into each of them and then needs to be tailored from a business model standpoint to hit that vertical in the way that hits hardest. And then on the small building things, what Ben's talking about is we're going to do a white paper. We're in the middle of doing a white paper on how energy efficiency and controls potentially analytics can scale into the other 50% of the buildings that we haven't touched yet.

And I think where I'm going in that, like in that direction, my perspective so far is that like you're saying, we it's the same stuff that I've been hitting on in my writing and on this podcast. It's just, we have to streamline things to make it not so messy. Like you're talking about the different categories. I think I have seven categories in my vendor landscape and you're right.

They're like all very similar, but also fragmented and somehow, yeah, it's tough. So people should be looking out for that white paper in about a couple of weeks after this podcast comes out. So everyone will see an email about that. I asked for no spoilers about it.

So I feel like I was betrayed just now, but cool. So as we wrap up here, let's talk specifically about if I'm a founder of a startup in this space, what advice do you have for me given that you've seen a bunch of pitches and are not active investor? It is a great question. You kind of are a startup in this space. I think the first thing is probably listen all James podcasts, get all of your team pro memberships at Nexus, put all of your new employees through the Nexus course. That's all the top of the list.

Now you don't need to put the ads on the, on the episode. I think that there's like a couple of things that are probably like pretty generic, but one that is very specific to this space is to be really conscious of what it's going to take to scale in this space. One building with performance is not 10 buildings with performance and 10 buildings with performance is not a hundred 10 buildings with a big portfolio is not necessarily a path to a hundred buildings with the same portfolio. And there are elements of that are technology related, depending upon what your solution is, that you have to have a pretty thoughtful understanding of the way that your solution is supposed to scale when it's implemented and what you rely on for the implementation process, especially if you need to be in buildings for that, or whether or not you need to be in buildings. If you rely on some part of the buildings controls architecture for it. It is unbelievable to me that on the energy side of the space, just don't know that there's like a building controller and that they're not getting access to it or like where their data is going to come from and the cost of scaling it and stuff like that, or how they're going to make changes to the operating conditions of a building. And just because that was something that worked for a specific client, a specific building and they did it in some way that was taped together and worked in one environment with one controller or even 10. I just see that super often when it gets into the technology.

And so I think there's a technology aspect of that. And then there's a customer aspect of that, which is like, how are you designing your business to scale? And if there's a certain respect that you need to pay to the way that this industry is structured, the chain of commerce in this industry that I was talking about at the beginning of this episode with generalist contractors and specialist contractors, which you rely on and who you need to be swimming upstream with to be able to get paid from you are not going to be able to do business with. There are some epic failures, if anybody wants to call me and talk about them, of folks who have had great technology that have tried to go to market to sell directly to building operators and have signed a bunch of contracts with building operators and have not had successful companies.

You need the integrator to be someone that you can work with. So anyways, there's a lot of examples like that, but I think that's a technology that's designed for scale that respects the space and a business plan that's designed for scale. The second thing I think would be sustainable unit economics of the product. I see a lot of folks who are not necessarily always thinking about the fully-costed economics of operating the business on really variable costing. Everything that goes into the implementation and scale of what you need to do for a customer seems interesting and end up having a sort of uncomfortable conversation.

Like this doesn't actually look like it's profitable. That ties to another element of it, which is an understanding of the working capital and capitalization of the business, which might be an implementation cost. It might be a capex cost. It might be a services organization that is realistically going to need to exist. I have a lot of startups thinking about themselves only as SaaS companies when realistically they have hardware units, they have ongoing services that they provide to customers that they're just calling their technology and R&D team that's really continuing to spend time with customers, but they're like, we're not going to need to continue to do that. That's got to really understand our business for what it is and think about what our unit economics really is. What is our true profitability? That's not a thing that an early stage company obviously knows about its maturity, but to have a thoughtful point of view on where it is today and where you're hopeful to get it to and how you want to invest in getting it there is something much more impressive than trying to bury it and say, we're something we're not. And then the last thing is really generic, but I think people get excited to raise capital.

I think it should be approached with intense humility. I made the comment earlier, you have a couple of things in your career that changed the arc of it. How many times are you going to raise capital in your career? Twice. It's hard it's also hard to invest for what it's worth. You should prepare very thoughtfully for it. You shouldn't rush into it.

You should think about it being the right time. Think very detailed about how and why you would use the capital to create value. A lot of people don't have a detailed use of proceeds. They provide a financial model and within their financial model is an implied budget, but it doesn't say on a page anywhere, here's how I would use capital and here's the value that I would hope to create. That would leave that up to the assumptions of an investor to try to come up with that. And why would any entrepreneur want a bunch of investors coming up with their own ideas about what you're trying to imply there? The last thing is having a good set of advisors about that.

That checkbox thing about venture capital is so real. So everyone's going to tell you no. And so you should just be prepared. They're going to tell you reasons why your business sucks, but they're going to tell you those reasons in the form of questions. And so if you have like a bunch of technical advisors about your product and a bunch of customers who are there, don't abuse those people's time, but if they're there and they're prepared to have high value conversations for you, they make a big difference because they provide you with a lot of credit.

Totally those are three great points. Thank you the startup will be grateful for that. Not a real startup. If you're a real startup, man, so am I. I started Keyframes at 16 months old. The most important point was, I'll repeat it, pro membership for Nexus.

I said it slow. Oh God all right let's wrap up what are you excited about the rest of this year? What are you looking forward to besides the white paper, of course? No, I can only think of the white paper having a giant mental block. And two hours ago, the Biden administration put on Instagram that we don't have to wear masks anymore.

I'm hopeful that that means that what seems like it's been a better year than last year will keep going. Awesome thanks, Ben thanks for coming on the show. Thanks for supporting Nexus. It's always fun to catch up. Yeah yeah i appreciate you having me.

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