

Data Center Development with Chad Fowler

Dan Breslin: Mr. Chad Fowler. Welcome to the Rei Diamond! Show! How are you today?

Chad Fowler - HED: I'm great thanks for having having me, Dan, or doing.

Dan Breslin: Yeah. So so for the listeners here. You're with hed design. And you're on the mission critical team, which is mostly focused on data center development. I guess data center design throughout the Us and around the world. Or what's the deal with that.

Chad Fowler - HED: We're primarily in us, based.

Chad Fowler - HED: the global market is there. And it's something that we have done a little bit of work and and future expansion into.

Dan Breslin: Perfect. So this will be a little bit of a diversion from probably a lot of the topics that we have on the show here. But I think this actually fits for a few reasons. Number one, we're talking about real estate development. I'd argue one of the most niche

Dan Breslin: value

Dan Breslin: I I would probably guess this is the highest value per square foot transactions that we saw in 2024 and 2023 if I had to guess on a price per square foot basis, like \$2,300 a square foot, I think, was one recently traded in Elk Grove Village, which our Chicago audience will know that name, but maybe not so much the rest of the folks around the country.

Dan Breslin: So we have real estate development really high price niche kind of real estate that we normally probably don't look at. But I thought, Hey, this is really an interesting topic, and I think you, I'm hoping we can get a nice little overview of the industry on today's podcast. Episode. Chad, what else did I miss from the short introduction here that might help fill in any holes.

Chad Fowler - HED: I'll I'll expand a little bit.

Chad Fowler - HED: I am an architect by training, so that is, my background is architecture. Hed is an Interdisciplinary Company concentrating on promote and

advancing our world. That is a it is where we focus on positive impact and and the future of what we can offer to our built environment and our communities.

Dan Breslin: Very cool.

Dan Breslin: Okay, so

Dan Breslin: why don't we start with defining a data center? What is a data center? And maybe it's like you're defining one in the last 18 months, because I'm betting that this industry has moved a whole lot in the 20 or 30 years that you guys have been designing these things.

Chad Fowler - HED: No, certainly has. Yeah, yeah, it's a whole different world now than when it started. Very exciting, very exciting time. So data centers.

Chad Fowler - HED: we are interacting with a data center. Right now.

Chad Fowler - HED: how you and I are talking. Virtually our everyday lives are becoming connected to data centers. The more and more technology we use.

Chad Fowler - HED: So that's that's driving this this rapid expansion in the market. And and a lot of other factors. So

Chad Fowler - HED: what are they? What are they? So they're they are information, storage locations, their information.

Chad Fowler - HED: they're information hubs transferring from one location to another location. They are areas that do calculations. There are areas. AI, so let's just jump to the AI AI learning AI calculations. AI data is all stored, developed and figured out in a data center.

Chad Fowler - HED: They are. They can be large, huge, large facilities. They can also be small facilities.

Chad Fowler - HED: Every office function has a need for some

Chad Fowler - HED: a small, small or medium data center component

Chad Fowler - HED: they can either be housed within by themselves

Chad Fowler - HED: and operated by themselves, or they go to co-location providers, which are larger facilities, and they become part of that larger infrastructure.

Dan Breslin: On the on the small end versus the large end and number of square feet, just to kind of talk real estate. What are we thinking, I mean

Dan Breslin: 200,000 on the large end.

Chad Fowler - HED: That's a good, that's a decent size medium building, 200,000 square feet.

Chad Fowler - HED: The smaller ones could be 10,000 square feet 1020, 50,000 square feet. That's that's kind of on the smaller side.

Chad Fowler - HED: larger. You're getting into up to a million square feet.

Chad Fowler - HED: and the power consumption of those are really are are really astronomical when you're when you think about it. So let's say, the 200,000 square foot building you're talking about.

Chad Fowler - HED: 2, 3 years ago. We're looking at 36 megawatts of it. Load so it's infrastructure load. That is the power that is going to the servers, which is what is housed within the data center.

Chad Fowler - HED: Then on top of that you have to add all the power that is associated with with cooling. As you're using that power, it generator generates a significant amount of heat, and you have to. You have to provide the cooling in order to heat. Reject that

Chad Fowler - HED: and then and then just the overall loads within the building.

Chad Fowler - HED: So we're looking at for 36 megawatts.

Chad Fowler - HED: You're looking at 36 plus megawatts for total power consumption within that building. It's really depending on the efficiency. You are there?

Dan Breslin: We were

Dan Breslin: put that in context, like, what is that? Is that like 600 houses worth of power, like.

Chad Fowler - HED: You are close.

Chad Fowler - HED: Yeah, yeah, you're talking about towns, towns.

Chad Fowler - HED: And this is going into a 200,000 square foot facility. So when you, when you look at that, all all within a spot that is, that is enormous amount of power in there.

Dan Breslin: Wow! So that was 2 or 3 years ago. You said right.

Chad Fowler - HED: 2 or 3 years ago.

Dan Breslin: What about now?

Chad Fowler - HED: So now. Now, we're getting to the point where we're not even sure how much power we can fit in that 200,000 square feet. Ai has really changed the change. Our environment in our world to be something completely different.

Chad Fowler - HED: Nvidia, you you hear a lot in your new in the news. A lot about Nvidia, what they're doing, what? What other of these companies similar to them are producing

Chad Fowler - HED: their rollouts are are taking an enormous amount of power and putting them in a very small square footage space.

Chad Fowler - HED: So if we take that 2,000 200,000 square foot building

Chad Fowler - HED: 36 megawatts, let's say in there. That would be right now. Today.

Chad Fowler - HED: you're almost doubling that power to that same squares, square footage.

Dan Breslin: Wow!

Chad Fowler - HED: The challenge is that that is, that's driving is, how do you? How do you take all that electricity, that heat that is generated in a smaller footprint. And how are you handling that

Chad Fowler - HED: so historically? That was done by

Chad Fowler - HED: air air distribution going over the servers? And air management. So the the supply air, which is cooled is forced through the inlet of the servers. It is then separated as it comes out. The back of the servers, which is the hot air, and then that recycles back into server. You can get

Chad Fowler - HED: You can get into the servers in this, an individual server to server is roughly 2 foot by 4 foot, let's say, and it can vary. Let's say it's 8 feet tall. So that's 1 server. So one server, is, is was historically somewhere between the 8 and 10 kw. Per per cabinet.

Chad Fowler - HED: Now that same cabinet, that same footprint, instead of that. Let's say the high end, and that's 10 kw. Power we're looking at.

Chad Fowler - HED: We're looking at 30 kw. 40 kw. 50 kw. Even more.

Chad Fowler - HED: So.

Dan Breslin: Mostly mostly that's the AI trend. And then Nvidia's new chips and that kind of thing. We hear a lot about.

Chad Fowler - HED: We're hearing all about those. Those are facility and the ability in order to do all that compute power in such a small area.

Chad Fowler - HED: And so and so efficiently.

Chad Fowler - HED: So now, in order to get there, you're actually providing a liquid based, or or some transferable based

Chad Fowler - HED: cooling medium that is transferred. And it's going directly into the

Chad Fowler - HED: the servers are the individual pieces within a that cabinet which is 2 part 2 foot by 4 foot piece it's going directly into there. And in some cases directly to that chip to provide the cooling exactly where you need to provide it at those densities. So those technologies.

Dan Breslin: It's almost yeah. It's almost following the the trend of the automobile. Right? I think the early Henry Ford, you know, model t's were air cooled right. And now you got a radiator in the car and

Dan Breslin: you're using antifreeze and a water pump, and you got the radiator kind of in the front, catching the catching, the air, going with a liquid base. That's amazing. That computer power now requires that technological leap.

Chad Fowler - HED: Yeah, yeah, think about you're sitting there. You're sitting at a computer right now, that computer is gonna have a bunch of wires for that's your that's your power and your in your connectivity to the outside world, and provide

another a couple of other connections there, where some sort of liquid is going in there just to cool what's inside your your small little computer. You have your desk.

Dan Breslin: That's wild. So we we have a a challenge, too. Right? So now you're

Dan Breslin: you're generating all this power. I remember a few years ago. I read something I can't remember if it was a book, or what Bill Gates, probably 5, 7 years ago, and I remember he was

Dan Breslin: kind of pitching the platform of nuclear power. So we're gonna run out of energy. And I'm thinking to myself, well, man, it's you know, because obviously electric cars are coming, and I get where he's coming from. What a nice guy that he wants to get us on nuclear so that we could have plenty of power for our air conditioner refrigerator. And now I'm coming to the realization he knew AI was a thing. They had data centers everywhere. Microsoft is

Dan Breslin: one of the, you know, most cutting edge companies certainly in in tech, and maybe in the world right now. And I'm like, Oh, he saw this coming, and we need, we need nuclear power to like power these data centers. So I guess it was more of a sort of a business initiative on his part, do you think that package nuclear power plant facilities are in our future here in the next 5 to 10 years, Chad, like where a data center is now gonna have its own uranium pellet. That's providing this kind of power.

Chad Fowler - HED: It's an interesting thought. In the yes, in the short term. I think something, if not that it's gonna be something similar to that that we see happen.

Chad Fowler - HED: right now you're seeing you're seeing the large tech companies, such as Microsoft and other they're looking at acquiring locations and restarting nuclear power plants.

Dan Breslin: That's okay.

Chad Fowler - HED: Within the the northeast. Now, what you were talking about is the is the kind of the small nuclear reactors, the module pieces that could be located on on on locations. That is a that is a hot topic. I think there's a lot of

regulations that that need to be kind of figured out. And how do you? How do you get those in in certain locations and jurisdictions?

Chad Fowler - HED: How is the community understand what it means to have that. It's a scary word, right?

Dan Breslin: Oh, yeah.

Chad Fowler - HED: I grew up in in in the 20 30 40 years ago. 50 years ago. That was certainly something that was that was not necessarily viewed as positive

Chad Fowler - HED: and and kind of the market.

Dan Breslin: I still don't know. What was it? Fukushima went like a few years ago, and like that was kind of a big deal, and it was scary and still is scary. So it still is scary to think we would have these

Dan Breslin: little trailers dropped off with little miniature nuclear devices in them that's gonna be powering, not my backyard.

Chad Fowler - HED: Yeah, exactly. Yeah, and and I think, and when you mentioned Bill Gates, his, what he's doing there's it's it's evaluating new technology and how that can be safer than what it was historically how we've been using it and what our our our views are on that. So. I believe, and I know I don't know a lot of information about it.

Chad Fowler - HED: in somewhere in the in the West. I think the Wyoming area. I think he's he's actually rolling out a

Chad Fowler - HED: a a trial of that technology.

Chad Fowler - HED: that's my belief, right? I believe.

Chad Fowler - HED: And once that happens. I'm I'm assuming that'll help open the doors for more of that to come.

Dan Breslin: Yeah. And I think his had to do with using the spent rods from the nuclear facilities, which is a big problem to store those in New Mexico. I think in some mountain somewhere like we're gonna run out of place. Put that stuff. And this new technology is supposed to kind of recycle that. And I guess I guess we're out on a limb calling nuclear a green technology. I mean, I think it glows green. So we do have that.

Chad Fowler - HED: Let's do that. Let's do that. Yeah, yeah, it is. Yeah, they all have. They all have their their upside and their downside. Right? Yeah, but it. But I think it's it is

Chad Fowler - HED: right now, the technology that's not fossil

Chad Fowler - HED: fueled that can efficiently provide the power that really the country is is looking to move into

Chad Fowler - HED: as as we move off, fossil fuel,

Chad Fowler - HED: driven appliances and and and cars and all that stuff. There's still the the power has to be generated in some fashion in order to get it to those those points. So the advancement in that technology or other technologies is gonna be vital in order to keep going.

Dan Breslin: Must happen. So while we're on the green topic, are there some.

Dan Breslin: you know, green design techniques that maybe were developed in the last 2 to 5 years that you guys have installed in data centers that might

Dan Breslin: be helping with the problem of the you know, the pooling, the large amount of power. Maybe just the way that the properties look. I don't know.

Chad Fowler - HED: There's a lot of that going on.

Chad Fowler - HED: it's it's it's hard to point to one specific thing. I will say,

Chad Fowler - HED: the data center market uses an enormous amount of energy. There's no if ands or but about but about that. Now, what you want to do is make the usage of that energy as efficient as possible.

Chad Fowler - HED: So so there's a metric that is, that's called that is used in in a tree. It's called

Chad Fowler - HED: PUE.

Chad Fowler - HED: Then now the Poe measures the amount of power that goes to the building, and then the amount of that power that is used for it the in source, the servers

Chad Fowler - HED: so

Chad Fowler - HED: historically. If you're looking back 2030 years ago you were looking at facilities that the Poe were was was 2 bus

Chad Fowler - HED: which which was which was meaning for every amount of power that was going to the server. You were using that same amount of power to your building and to cooling technology.

Chad Fowler - HED: So 2 2 is not a good number one would be the would be all the power going to that building. Is going straight to your it. Now we're designing the facilities that that are much closer to that one. So 1.2, 1 a little bit, one below that, 1.1 5 and and so

Chad Fowler - HED: you can see where we started and where we currently are. I mean ideally, somewhere, we'll get into them into below one right? And where we're actually generator power and pushing it back.

Chad Fowler - HED: but so how do we get there? And how does sustainability come into that? Answer. So

Chad Fowler - HED: the market drives a lot of research.

Chad Fowler - HED: a lot of motivation to make that more efficient. So cooling technologies.

Chad Fowler - HED: The advancement over the 5 years of how efficiently the cooling technology is is distributing that air to the servers. And just functionally how much power it takes to to make those work has grown substantially the large

Chad Fowler - HED: tech companies, the large reits that are developing. They're all working with manufacturers in order to help

Chad Fowler - HED: those manufacturers develop equipment that operates the most efficiently that it can. That means more money in your development, right in the end of the day. You're saving money on the operations and overall

Chad Fowler - HED: other aspects in technology is certainly I mean, in sustainability is is with the building itself.

Chad Fowler - HED: I think there's more of a concentration to make buildings themselves, either some sort of lead level, higher carbon carbon footprint.

evaluating how all that goes into the buildings, what material you're using, what's what's the efficiency there? Also, location location becomes a big driver.

Chad Fowler - HED: geographic location is is the power you're going to ultimately utilize. Where does that come from? Pacific Northwest? There's a lot of hydro power up there. So that's I mean, there's the the good and bad of hydropower, right? But it's

Chad Fowler - HED: generally a green power source

Chad Fowler - HED: and then we're talking about nuclear before. So if if it's new, nuclear sourced, but by far most of it's still fossil fuel driven.

Chad Fowler - HED: And so.

Dan Breslin: When we when we talk about the location, Chad.

Dan Breslin: You can't just put these out in the middle of Wyoming, either. Right? Don't they sort of have to be near the population base, due to distance or with the technology for data transfer, can it literally be halfway around the world? And it doesn't matter.

Chad Fowler - HED: It's really what's happening in the data center.

Chad Fowler - HED: some of some. I, some of the AI stuff that's going on right now really can be in the middle of Wyoming. Cause it. It's it's a it's actually self perpetuating. It's working within itself. And then it's sending information out. It's not it's not as critical. How? How? We'll we'll say latency, which is how much time it takes the information to go from that server to you.

Chad Fowler - HED: But there are things that are latency dependent. Right? So at night, if you're gonna go log on to Netflix, and and you want to start up your movie. You don't want to sit there and see that will spinning for for even even 10 seconds. You're going. What's wrong.

Dan Breslin: Seconds.

Chad Fowler - HED: Right? Exactly. That's an eternity.

Chad Fowler - HED: So those are the areas where you want your you want that that proximity is is vital. And then certainly, if you get the financial World stock market you're getting, you're getting. Certainly milliseconds is is is critical as well.

Dan Breslin: Yeah, I mean, you mentioned the AI can be slightly latent.

Dan Breslin: And I think we're

Dan Breslin: forgiving right now, because AI is a new technology. So you go in and you do deep research. And AI Gemini Google's version you set up your prompts and then admit what? 5, 10 min later you get back this nice report. That report probably could have been done by Mckinsey or something, and probably would have taken 30 days.

Dan Breslin: We're willing to wait 8 min for that now, right? But what's that gonna look like in, you know, 5 years from now? Is it? Kind of kind of be like dial up modem. And all of a sudden this, you know, Wyoming, AI data centers who's gonna rent that that thing bankrupt? What idiot thought that was a good idea.

Dan Breslin: But one thing on AI. I I took a call. I can't remember what the call was, but I remember thinking

Dan Breslin: there's a big, pregnant pause.

Dan Breslin: I think this is AI. It felt like latency now. I didn't ask it if it was AI, but the voice sure sounded robotic.

Dan Breslin: and it was some kind of confirmation called, you know, customer service thing somewhere. AI certainly would be plugged in. It. Got whatever I was looking for done because I don't remember being frustrated at the end. But I remember thinking.

Dan Breslin: there's this odd, long pause, and maybe that's the latency of the distance to the data centers that they're using now, right.

Chad Fowler - HED: It could. Yeah, it could be. It could be. I had. I had a well, I I unfortunately, I answered, a robo call yesterday, so I was thinking of something else, and I had a similar experience where I started to say Hello! And then there was a there was a pause. I'm like, Oh, maybe no one's there. Then someone started to talk, and then I responded, then there was the pause, and I'm like, Okay.

Chad Fowler - HED: and then.

Dan Breslin: Talking to a machine.

Chad Fowler - HED: Machine. So so and certainly in our future, that's gonna change. It's gotta change right? There's gonna be some sort of prompt. There's gonna be a point where you're you're not. We're not gonna know what that is. But I think AI is a huge boom in AI, and how and what we use it for. I don't even think we know how we're gonna ultimately use it yet. Sure somebody does. But

Chad Fowler - HED: but it's gonna continue and continue and continue to improve as it as it as it develops. And really, the facilities data centers that we're doing now

Chad Fowler - HED: are are really facilitating those AI to to become what it will be in the future.

Chad Fowler - HED: Because there is, there is a learning environment to AI, it's it's gotta.

Chad Fowler - HED: It's not our learning per se. But it's gotta have that data. And you gotta

Chad Fowler - HED: feed that data into the into it in order to be able.

Dan Breslin: Do, do you think I mean you've been present, and operating as an architect for the past 30 years, which which was what you mentioned before we started the call here today.

Dan Breslin: So that would have put us

Dan Breslin: through the.com. But a boom and bust.

Dan Breslin: and we're in the AI boom right now. And I wonder, from your perspective, with the number and size of centers and the kind of money that's thrown around for these things. I believe they over built the data centers in like 96, 97, 98, 99, 2,000. They were building and building and building and built way. More capacity than we needed up until about what was it? Oh, 3, 0, 4, 0, 5. When video finally came online suddenly, we didn't have enough capacity anymore. Do you feel like we're

Dan Breslin: at the peak of Data Center development.

Chad Fowler - HED: Yet, or maybe I'm totally off base, and we still have such a humongous runway to go. It's it's like unexplainable.

Chad Fowler - HED: And and certainly I think about the.com days, certainly. and and when that's coming again

Chad Fowler - HED: I don't think we're there yet. I mean, I think

Chad Fowler - HED: I think that was that that was way

Chad Fowler - HED: before it's time the.com kind of boom

Chad Fowler - HED: as we we saw it was kind of prepping for something that never wasn't happening at the same

Chad Fowler - HED: hey?

Dan Breslin: That's right.

Chad Fowler - HED: Yeah, but

Chad Fowler - HED: But now what? I'm my understanding of of

Chad Fowler - HED: the people that are driving this market, what their plans are over the next year. I mean the amount of money that they're they're pouring into this is is mind boggling, and will continue to grow, probably for for the foreseeable future. It is gonna change. When will that happen? I I don't know, but it's not going to be in the next, I would say not. Certainly not. The next 5 plus years.

Dan Breslin: Okay, wow.

Dan Breslin: So I guess we should all buy more Nvidia stock, then, is that kind.

Chad Fowler - HED: Know? That's yeah.

Chad Fowler - HED: Yeah.

Dan Breslin: Yeah.

Chad Fowler - HED: I mean, that's just starting right? That's that's gonna that's gonna

Chad Fowler - HED: there's gonna be more of them. They're starting everybody. There's others that are developing it,

Chad Fowler - HED: and and where, I mean, where we are in the data center development. And what those mean is we we don't understand what that means to the buildings still.

Chad Fowler - HED: right now, in order to deploy like a Nvidia lineup. You're you're going into, say, a 60,000 square foot.

Chad Fowler - HED: computer room. That's that's what we call white space, where, where, historically, would be lines and lines and lines of cabinets and servers. You're going in a room. And and there's 10% of that room being utilized for the Nvidia servers. That's it. So it's a big empty space. So so really, how we plan and how we.

Chad Fowler - HED: how we, how we plan the buildings.

Chad Fowler - HED: And how do we? How do we make these buildings more efficient is something that that is coming, and will start to happen

Chad Fowler - HED: over the next few years, as we, as we see how we can

Chad Fowler - HED: provide all the the backbone of the equipment and get that.

Chad Fowler - HED: get that cooling and that power to such a small space.

Dan Breslin: So so are you telling me that you know someone built? How big is the actual bill? Is it like 80,000 feet to make a 60,000 foot

Dan Breslin: white space.

Chad Fowler - HED: So when I when I say 60,000 square foot, white space there there could be. There could be 6 of those within a 2 200,000 square, that 200,000 square foot building.

Chad Fowler - HED: you're saying there's well, actually, that one would have less than 6 of them. But yeah.

Dan Breslin: Understood. Understood.

Dan Breslin: So 10% is the Nvidia build out? Is the other? Is the rest just vacant for future expansion, or like.

Chad Fowler - HED: It's vacant because there's no additional power to be used there. And I mean, that's an extreme event. That's an extreme.

Chad Fowler - HED: Okay? And.

Dan Breslin: We're not building a bunch of empty data centers as we speak. That's not happening.

Chad Fowler - HED: It is. It's it's it's what what, what's that's driving change in the industry. And so

Chad Fowler - HED: it's, it's it's exciting to see what's gonna happen.

Dan Breslin: Would you mind breaking down sort of the owners like, you know, we mentioned reits, and we think, you know, reach just like renting out the space. Are we talking? 200,000 square feet, and the whole thing is rented to Amazon web service? I mean, they probably are building their own for aws, and they are 100 full, but like, what's the makeup of? A 200,000 square foot building with

Dan Breslin: 3 60,000 square foot white spaces, I mean, are they all one tenant, or they're like 17 tenants, you know what's kind of the business model behind the scene, Chad, if you know.

Chad Fowler - HED: I I it's it's any and all above to be really right now.

Chad Fowler - HED: the large tech companies, like, as you mentioned Amazon, the Microsoft's. All those of the world.

Chad Fowler - HED: are expanding so fast that they're they're they are. They're building their own facilities and operating their own facilities. They're also going to

Chad Fowler - HED: the these reits and taking an entire building that they've built and developed

Chad Fowler - HED: just just because they can get that online faster than than how then they can develop their own buildings. So that's the speed of market that they're working under. so that's that's a big impact that's happening there now. But historically.

Chad Fowler - HED: there's a mixture. I think different companies have different philosophies on how to do that. There are. There are a number of of reits that kind of

Chad Fowler - HED: develop the the and then and then they lease. It's very much co location. So they're they're either leasing. They're leasing cabinet space so it could be one cabinet to a client. It could be 10 cabinets in a in a room that could that could house a thousand cabinets. So there's a breakdown on that and then there's the in between that you have.

Chad Fowler - HED: you have. companies that that need the compute power of

Chad Fowler - HED: 6 megawatts, 8 megawatts, 10 megawatts of power, and they lease the the entire room.

Chad Fowler - HED: So that's all the room in order to do what their their requirements are

Chad Fowler - HED: so any and all above.

Chad Fowler - HED: But by far the biggest impact right now is from those large tech companies there where you're taking hold buildings down.

Chad Fowler - HED: That's really, that's really the ultimate goal in that world.

Dan Breslin: Yeah, so so are they built on spec. And then they

Dan Breslin: put them out as like sort of a co-location. And Microsoft's like, Hey, we need all we need it all. Here's a lease. Is that kind of how they're going down.

Chad Fowler - HED: Kind of yeah, you and you might have to tweak. You might have to make some adjustments in order to to

Chad Fowler - HED: to cause their their their kit that they put in there, which is all their servers and things might need to have a few different requirements than what that spec build has

Chad Fowler - HED: so you might have to make some modifications in order to ultimately.

Dan Breslin: So that would that would be the developer or the owner of the building is making those modifications on their dime. And now Microsoft comes in, and we'll take that for 5 or 10 year. Lease something like that.

Chad Fowler - HED: Yeah, yeah.

Dan Breslin: Okay.

Dan Breslin: I guess one of the risks. If I'm the developer and I build a site.

Dan Breslin: I mean some new chip could come in. AI could design some better version of itself in a in a Utopian world.

Chad Fowler - HED: Yeah, yeah.

Dan Breslin: Yeah, right? And and suddenly, you know what used to take 60,000 square feet happens on one server rack. And now we're overbuilt.

Dan Breslin: And then the other thing is that the technology is moving so fast I would imagine you would know more than me. But in 30 years how fast technology move where, after Microsoft has gone

Dan Breslin: now the layout where they were all air cooled servers.

Dan Breslin: Now they're all liquid, cooled servers like I don't know what

Dan Breslin: more modification will be necessary for that, landlord? But you'd have a pretty big bill to sort of upgrade the technology at the end of each lease right.

Chad Fowler - HED: There is.

Chad Fowler - HED: but I mean, there's there's still facilities that are operating that were built 20 years ago in these co-location spaces. Some of those were long term leases, but they do flip there's still a market that people do not need these high densities that we're talking about.

Chad Fowler - HED: It's it's it is. It is the hot topic in our world in Data center design, right now that these these enormous loads, because that's driving all the change. But there's still a strong market of of people in the smaller

Chad Fowler - HED: avenue that can still accommodate the historical loading power densities that older facilities were designed for.

Chad Fowler - HED: But I mean as designers.

Chad Fowler - HED: Forward thinking, I mean, you can't. There's there's there's a lot of unknown what it's gonna happen. But you do

Chad Fowler - HED: want to design a facility that is purposely built for what it's doing today.

Chad Fowler - HED: But in many cases some philosophy or thought is given in order to if it needs to change

Chad Fowler - HED: can you.

Dan Breslin: Give me an example of a design decision that fell into that latter category.

Chad Fowler - HED: Sure so.

Chad Fowler - HED: and it's actually very common right now. Will it need liquid cooling? Well, when you're when you're building this, when you're designing a space, and you're building it on spec. Will it need liquid cooling, will it not need liquid cooling? You don't know. You don't know what those requirements are so so what you're you're you're looking at the facility and and looking at ways

Chad Fowler - HED: you might. Your base design will not incorporate liquid cooling.

Chad Fowler - HED: but your planning will allow that to come in

Chad Fowler - HED: down sometime down the road. Hopefully, it's still in design, or or if it's being built, it's easily flexible in order to pivot

Chad Fowler - HED: without having to adjust

Chad Fowler - HED: really the bones of the building. Right you the you need it. You need to have your structural loading in order to accommodate. You don't want to go back back in and reinforce everything you want to have your clearances able to accommodate the additional equipment without relaying out the whole building and and possibly losing

Chad Fowler - HED: some leasable space. So those things are are kind of

Chad Fowler - HED: those are the things that we're looking at now in the planning to make sure that there is flexibility for what we see

Chad Fowler - HED: possibly coming down the road now.

Chad Fowler - HED: And is that.

Dan Breslin: As simple as a 24 inch, you know, between or underneath of the floor, where the servers sit with flexible panels, or something like that that would allow someone to modify that at a future date.

Chad Fowler - HED: Somewhat right now.

Chad Fowler - HED: Right now the raised floor system is less.

Chad Fowler - HED: less and less facilities are using that.

Dan Breslin: Okay.

Chad Fowler - HED: 24 was is kind of a low density. Lower density. Height. We're getting, commonly we're 30, 36 inches or more in order to get

Chad Fowler - HED: the the air up to that 10 kw, kind of what we're talking about before. But now

Chad Fowler - HED: Now the race floor is going away, and the room is actually being pressurized in order to do that. So air management is critical. So there's there's a there's a there is a

Chad Fowler - HED: planning.

Chad Fowler - HED: When you're planning the facility it is important to plan. You're you are planning hot and cold aisles

Chad Fowler - HED: kind of what I was talking about. The servers have intake. That's where the cold air comes out, and then it has exhaust. That's where the the hot air comes out. So you never want those 2 to mix. So so there are. There's containment

Chad Fowler - HED: that that actually surround the servers, so that those 2, the cold air being blown within the space, and that hot air being pulled back to the units to be

Chad Fowler - HED: to be cooled again.

Chad Fowler - HED: Don't cross, which is which they like.

Dan Breslin: Were they like that?

Dan Breslin: Were they like that like 1520 years ago, too.

Chad Fowler - HED: So when I started my career, you'd walk into a facility, and and the servers were blowing hot air into the one ends of the intake, and then it was it was a disaster. And so and so it's funny to look back and think that's what was going on. And now and now it's unheard of. You would never do that. Why, you you'd walk in, and and and that management philosophy would be

Chad Fowler - HED: certainly the 1st thing you would say, fix your airflow. You gotta fix your airflow in order to be more efficient in your power consumption. So.

Dan Breslin: I mean, I imagine that's that's not cheap to do that, though I mean.

Chad Fowler - HED: No.

Dan Breslin: 20 years ago. If it wasn't necessary, then why would you want to spend all the time with? I don't know. Plexiglass walls and sealant and everything. It's like real expensive to put that. Come on, man, we're just trying to get this thing leased.

Chad Fowler - HED: Exactly. Yeah, yeah.

Chad Fowler - HED: right? And and who who would have thought you would have been in this problem? Got into? But yeah, over the last. Certainly 1520 years. Yeah, 1510, 15 years. There's more of a concentration on making sure that never that doesn't happen in that. In that containment.

Dan Breslin: Yeah, smart. Speak, speaking of the costs to build, do you have any any big

Dan Breslin: big numbers per square foot, or anything like that that you've seen go down. I mean, what's the cost? If they're spending \$2,300 a foot to buy an existing data center? And I think they were going to put another 1 billion dollars into it or something like that. But

Dan Breslin: I mean, what is it? \$2,100 a foot to build it. \$1,600 a foot to build? Or is this like include all the computer equipment as well.

Chad Fowler - HED: So there's a lot there.

Chad Fowler - HED: The the land and the building is enormous cost, because it has all the equipment, but that the it build out of that

Chad Fowler - HED: is is

Chad Fowler - HED: is something I can't even guess for you right now. The costs that I'm seeing on single cabinets and on on some of these servers

Chad Fowler - HED: or multi 1 million dollar range.

Dan Breslin: Wow!

Chad Fowler - HED: So millions and millions of dollars. So I'm not even gonna go to what what the it kit costs to be honest with you.

Dan Breslin: All right, all right.

Chad Fowler - HED: But on developing the buildings.

Chad Fowler - HED: I don't have a good recent metric.

Chad Fowler - HED: I there was a time.

Chad Fowler - HED: that it was we were looking at. We were quoting kind of 10 million dollars a megawatt.

Chad Fowler - HED: But now I think, with with the things that are changing and and the demand on the the sector that those numbers are

Chad Fowler - HED: oh, increasing.

Dan Breslin: Interesting. So it's probably gonna be more than I think. We're spending

Dan Breslin: spending like a hundred \$6 a foot to build a 3 story class, a self storage facility in Lawrenceville, Georgia.

Chad Fowler - HED: I can't just go throw a couple of racks in there and call the data center, and we'll just, you know.

Chad Fowler - HED: But you could.

Chad Fowler - HED: I'm not sure how much you're gonna lease it, for though those tenants are not, gonna be your your return on investment might be a little different.

Dan Breslin: Yeah, we'd have to go after that that old, 20 years old racks that's still operating secondary market. It sounds like.

Chad Fowler - HED: Yeah, yeah.

Dan Breslin: You, I mean 500 bucks a foot 400 a foot, do you think, for the envelope.

Dan Breslin: Yeah, I had to guess.

Chad Fowler - HED: I I think it's somewhere in there. I I don't quote me on that

Dan Breslin: Yeah, no, no. One's gonna call you from my audience and try to build one and be like yo, Chad, you said this was 400. What do you mean? 7, 50. You're like inflation, Bud. What do you want me to do?

Chad Fowler - HED: Yeah, exactly.

Chad Fowler - HED: It's it's a moving target. But yeah, I would say something in the in that range on a square foot basis would be.

Dan Breslin: Oh, what else did I forget to ask that you feel like might be interesting or important for the listeners here before we wrap up.

Chad Fowler - HED: I guess in in

Chad Fowler - HED: something interesting in in this space is is data. Centers have gotten a lot of bad publicity.

Chad Fowler - HED: They use a lot of energy. They're dirty. They're loud, and I think.

Chad Fowler - HED: and I think there's there's there's a lot of concentration on. What we're doing now is is to try to try to educate the the public. And well, one. Well, what is a data center? Right? I mean, why, I mean, do you know, every time you go on social media, you're connecting to a data center.

Chad Fowler - HED: I don't think

Chad Fowler - HED: generally people understand how how that affects their daily lives and what it means to us. So communities are are a little

Chad Fowler - HED: a little, let's say, shy. And and I don't want that development in my backyard right now. So I think I think as an industry we're looking at kind of expanding our education to to the world, on, on how one? How do you use them.

Chad Fowler - HED: They're not scary. If you look at buildings that were done 20 years ago. Yeah, they're gray boxes behind this big security fence. They're they're they're somewhere. You never go. You're not allowed to go there. So so how do you? How do we change that image? There's a lot of?

Chad Fowler - HED: There's a lot of

Chad Fowler - HED: push within jurisdictions and other areas. The buildings are contextually designed to fit within the spaces.

Chad Fowler - HED: So so though that is

Chad Fowler - HED: is a little bit more community. Friendly? Certainly. And then then educating people

Chad Fowler - HED: on how and what and why they're. There is one thing. What are the benefits they bring to to the community in our, in, in lives.

Chad Fowler - HED: and then, and then also educating it is is a market that's growing so much that it's hard to find people to to come in and help

Chad Fowler - HED: design one

Chad Fowler - HED: help operate. There's not enough people operating them. There's not enough people to construct them. The skilled labor associated that with so I think.

Chad Fowler - HED: really seen a a more push in the education front in order to promote

Chad Fowler - HED: communities. Allowing more of these, understanding them, also promoting knowledge, and what it takes to to design, operate

Chad Fowler - HED: or build these facilities in order to encourage people to come into the trades, or the or or design aspects

Chad Fowler - HED: of of the space.

Dan Breslin: Yeah. And that doesn't sound any different than anything we ever get entitled or improved like doesn't matter if it's a single family house

Dan Breslin: a shed or hot tub in the backyard, or you know,

Dan Breslin: storage facility or a giant flex warehouse like they never want it on. Everyone hates it.

Dan Breslin: They don't want the corners, you know, turned into a wawa which the convenience store in the Northeastern United States, where I grew up. They don't want it there. But then they shop there and get their gas there, and they're there like 5 out of 7 days a week. Anyway, it's like, Wait a minute you guys were fighting this, what are you doing?

Dan Breslin: But data, a data center

Dan Breslin: does not necessarily have heavy truck traffic in and out all the time. Once every.

Chad Fowler - HED: It doesn't. I mean, you're you're right. Your your biggest demand is under construction, and when you're building it out, the rest.

Chad Fowler - HED: the the actual amount of people in the spaces is is minuscule compared to the size of the building and the traffic. So there's a lot of benefits. In some cases, a lot of communities because you don't have to upgrade all of your

Chad Fowler - HED: support

Chad Fowler - HED: areas, your roadways, your all that. Because if you're not, it's not a big office space where you're you're you're having

Chad Fowler - HED: having a thousand people go to that facility.

Dan Breslin: Yeah, or a thousand trucks and and.

Chad Fowler - HED: In school.

Dan Breslin: Square foot, you know, bomber of an industrial warehouse is never gonna work

Dan Breslin: before I ask my final question, Chad.

Dan Breslin: is there is there anywhere. Listeners can go to get some more information about this. You, or maybe HED design.

Chad Fowler - HED: Sure I'm happy to have anybody visit. Our website website is HD, dot design.

Chad Fowler - HED: So you learn more about us and what we do. There.

Dan Breslin: Nice and my final question, Chad, what is the kindest thing anyone has ever done for you?

Chad Fowler - HED: That is an interesting question.

Chad Fowler - HED: The kindest thing.

Chad Fowler - HED: I don't think I'd be where I am without many people doing a lot of kind things for me. And certainly

Chad Fowler - HED: How? How? How? How do you pick one of those out out of all of them? That's that's a difficult choice.

Chad Fowler - HED: I guess I mean

Chad Fowler - HED: when you look at it, it falls to family, I think, is the kindest thing.

Chad Fowler - HED: certainly, all my family and my coworkers, and everybody does an immense thing. But I have kids. I gotta say just just when when you're I have 2 sons when one of them runs up and and gives you a hug, and that really is the kindest thing that happens to me any any time.

Chad Fowler - HED: That's it.

Dan Breslin: I love it. I love it, hey? I I have pages and pages of notes here. I really appreciate you coming on the show and giving us your time. What an interesting

Dan Breslin: topic at the forefront of our technological revolution known as human existence here. Thank you, Chad, for coming on the show.

Chad Fowler - HED: I thank you for having me, dan

Chad Fowler - HED: It was great to talk to you.