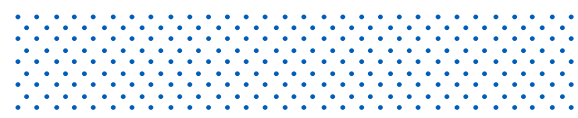


2021 Technology Trends: The Year of Acceleration



CAPTECH TRENDS | PODCAST | EPISODE 14



Dennis:

Hello, and welcome to CapTech Trends, a place where we meet with thought leaders and subject matter experts to discuss emerging technology, design, and project methodology. You may be wondering about the new voice. I'm your guest host today. My name is Dennis and I'm a principal with CapTech Consulting. I founded our agile practice and I'm a long-time technology and management consultant. But today we're discussing trends for 2021 and we're mixing it up by moving Vinnie from host to guest. If you've listened to other podcasts, you'll know Vinnie as the CTO of CapTech and part of his team's responsibility is to forecast trends in technology and innovation. So, let's dive in and talk about the trends for 2021. Welcome to your podcast.

Vinnie:

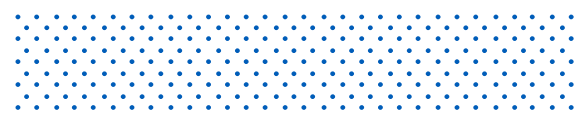
Thank you. It's fun being on this side.

Dennis:

Yeah. So, 2021 is going to be a much better year. We're all excited about it, but as we talk a little bit about 2020, it was a big year of uncertainty and change. That's not a news flash for anybody here. We had social unrest, political upheaval, and just massive life-changing interruptions thanks to COVID. Let's not talk anymore about that. I think we've had enough.

Vinnie:

Well, we have a couple of podcasts out about that if people do want to go listen to that. I think one of the big takeaways from last year that we can move into our discussion on trends is that the organizations that had healthy methodologies and had healthy architectures—and we can get into what that means—were well-positioned to succeed, macro conditions aside. I mean, if you're in travel and entertainment obviously there's not much you can do. But for the bulk of the companies, they were able to weather the storm and actually increase or improve their delivery for their customers in many ways because they were set up to do so.



Dennis:

I totally agree. We've seen that part of our business. We get to work with lots of different organizations and see how they're adapting and help them with that change curve. And in addition to being ready for change and being able to accept that change, I think we also had to all accept that consumer behavior is changing. My guess is that's something that is going to continue. I'm feeding this of course because I read your paper.

Vinnie:

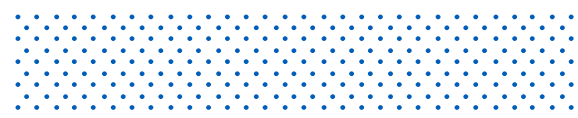
Since you said that, why don't you plug the paper really quick.

Dennis:

A little plug. We won't take too long on it. What we're talking about today is that Vinnie has actually published some of these things and this will be an interview about that. So the [trends for 2021](#), you can find those on www.captechconsulting.com/insights and it's a fairly in-depth discussion of key trends. What we're going to talk about this more today is, Vinnie, some ubiquitous changes that we expect will affect a large portion of our listeners and the different organizations they work with it. There are a lot of other changes, but we're trying to nail this down to something that makes sense for the audience. How would you change what I just described?

Vinnie:

We do this every year. A large part of our job is to listen to our clients, our own development teams, account managers, and business development, and synthesize all of that information against the good engineering discipline, rigor, and usability standards that we know. What's interesting about this year is that previous years were a little more direct and obvious. When mobile was coming out and replacing the desktop as a platform, we were ahead of the curve on that. At the time, that was a new technology trend—same thing with smart speakers, Machine Learning, computer vision, and augmented reality. We can make predictions based on those and valid use cases over the last several years. This year, we're not predicting a new disruptive technology.



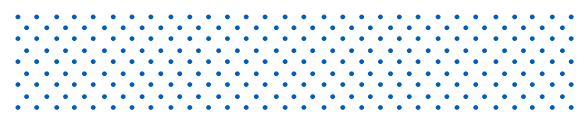
The way I'm looking at this year is that all of those things that were cutting edge are now table stakes. They've been vetted. People are using them. They have a good surprise and delight factor—a good brand factor. And it's more about a maturity and integration of those technologies. If you're doing voice without Machine Learning, you need to consider adding that in because it gives you so much more effectiveness with it. So, it's really the integration of the trends, and the maturity of the trends, and the maturity of the platforms that, when done well, are going to increase the user experience and the value of the applications and services companies provide.

Dennis:

I think that should resonate with a lot of people who are in the technology world. We're not seeing major changes in technology that are being launched right now. What we are seeing are opportunities to adapt and adopt to move your game to the next level. I think that was something I took from reading [our trends](#). One of the terms that I think you might have used in there is “change surfer”, right? So that's something that I wrote down in my notes, that companies need to be able to surf on the change that we're all experiencing together. The ones that are going to be successful have certain qualities that they bring to the game. There are certain ways that they roll that is allowing them to be more productive. What are some of the things that you're seeing that will allow others to ride this wave?

Vinnie:

Taking a kind of half step back from that. A lot of organizations have a disconnect between reading a white paper, knowing that they have to change quickly, and knowing that they should be agile and then taking action. They need to follow agile more closely or implement it consistently across an organization so you can embrace these ideas about failing fast, being flexible, and being nimble. But if you don't have the architecture, methodology or DevOps in place— if you're not in the cloud, or private cloud doing instant provisioning, then you're asking your teams to do things that you're not providing an environment for. So, it's really critical when you look the companies that did well in COVID, and the companies that will continue to do well now, are ones that know that flexibility, agility, and fast delivery of functionality comes from discipline. It comes from having a good architecture, data governance, and data pipeline. It comes from good methodology. It comes from good



DevOps. It comes from good design. If you don't have that as part of your muscle memory, then that gets into the dysfunction of why teams don't perform well.

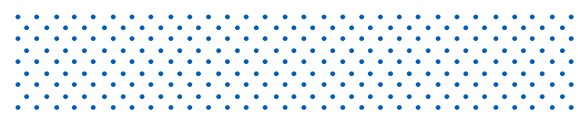
Dennis:

I totally agree. I think that, in the past, we've talked about the need for these kinds of changes and innovations in your organization, because they're going to help you go faster and get more product that's more innovative in the hands of your customers. But this has really highlighted for me the core that lets you pivot. You can pivot and you can capitalize when changes like this are coming down the pipe. You can move quickly enough to get ahead of it. I think that that's fairly self-explanatory now looking in the rear-view mirror. We see that with so many of the folks we work with so there's no going back. The change we've experienced is locked in and it's going to continue to sail forward. But what we can talk about is how we use this moment to continue to accelerate. And there's four big trends that you called out in the [2021 trends paper](#). I'd like to hit each one of those and give people a flavor of what we're expecting in the space.

The first one being, "More complete data will lead to leaps in actual insights." Unpack that for us.

Vinnie:

Sure. Everyone knows the five V's of data, right? Variety, velocity, veracity, and value. What is happening now with IoT, not just devices in manufacturing or things like that, but wearable technology, home automation, smart devices, IoT devices are in a world now where 5g is available. So, we can push more to the edge. We can capture more at the edge. We can do more Machine Learning at the edge. And it's about how the amount of data we're collecting, the accuracy of the data we're collecting and the amount of trust we can put into the data that is all going up at the same time. So much more data is coming into organizations. And that means is you can apply Machine Learning models and AI against those data sets in ways that give you a much better accuracy in the predictions and in the results. What's frustrating is that you see the data increase and yet the value to the customer or the Machine Learning and AI does not see it. I think one example that kind of resonates with most people is— you buy something like a pair of running shoes. And then for the next



four weeks Facebook and everything else is pummeling you with ads to buy running shoes, something you've already done. So, it's frustrating that we have all the data that we need, and these platforms know a ton about us, and yet they don't benefit us in a way that's more subtle and more valuable. It's like the technology hits you over the head and it's often wrong. It leads to frustration not increased satisfaction.

Dennis:

Right. When it's done well, it's a helper and it's making your experience as a consumer better. But when that example that you gave, we've all lived through that and think, "Thank you very much, I've got my running shoes." But then you're going to hear about it for the next three months. And when you look at the four V's—variety, velocity, veracity, and value—veracity is the one that jumps out that we need to know. We need to be able to say, "I know these things about my customer, and I can connect them in such a way that I actually have a true picture of what it is they want." And it sounds like, as I read through your statements and compared it to what I know, is that's the piece that has been missing – to be able to really have veracity in the data and have a useful picture of the customer.

Vinnie:

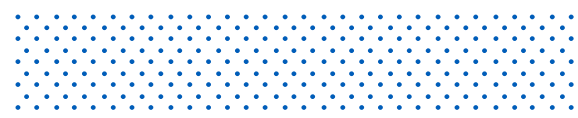
Actually, there are five V's—volume was the fifth one. You're right with veracity. You have to trust the data and that actually plays into a trend we didn't talk about in the paper, but we'll be talking about throughout the year and that's compliance and regulations as it relates to data. So, knowing what you have and knowing that it's accurate is a core value to organizations that are relying on making decisions based on their data, as well as complying with new privacy regulations.

Dennis:

Right. And as we expand this data footprint with more volume, we also see more truth in that data. As we look across the industry, what are some of the examples you see?

Vinnie:

One I think about a lot is healthcare and wearables. The amount of data that your body is



throwing off all the time, even subtle motions, can be used to make a lot of predictions about your health and wellbeing. For instance, there's technology I've read about that can measure the gait and movement of an elderly person walking, how many stairs they're going up and down, the rate they're doing it, the way their body leans, et cetera. And sometimes someone who's elderly can fall and break a hip, or sometimes their hip breaks and they fall, right? So, what this information can tell you using that Machine Learning information is, that a week before you're going to fall and break your hip or break your hip and fall, the smart device may be able to detect that you're changing your behaviors in a way that's consistent with people who in the future will have this condition or this fall. So, you can go in and start getting rehab services and physical training exercises to do at home to help prevent that before it happens.

Dennis:

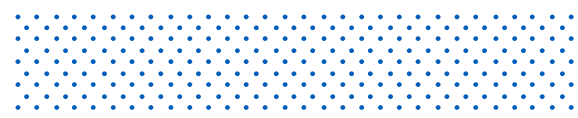
That's a great example and sign me up! We all want to know we're volunteering our data for a purpose. So that's the kind of purpose that people can get behind.

Vinnie:

Right. And you could do other things with all sorts of edge computing, edge devices, manufacturing, transportation, and a lot more. For example, imagine the life cycle of a perishable deliverable like the home chef services where they send you a box of food and just the ingredients you need, and the directions to cook them. Imagine affordable sensors on these boxes, that note temperature, vibration, duration at a temperature, etc. You know, you can have a freshness value and predictor based on those things that would make a lot of people feel more secure about the food they're ordering.

Dennis:

Let's jump ahead to one of the next trends that you identified. So, if we look at the second one in the paper, it was, "Enhanced cloud capabilities will advance digital transformation." The way I process that, is that when everyone is aware, it's time to move to the cloud. There's a lot of benefits to doing that, but how do you actually get more value out of doing it other than just being in the cloud? What are some of the cloud benefits that aren't being utilized?

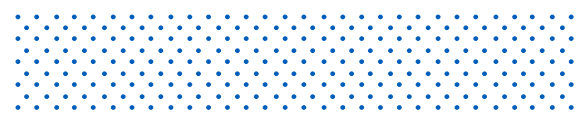


Vinnie:

So really what I focus on isn't that moving to the cloud is good. I think that most people have already made that shift in their brain. And actually, there are cases when people shouldn't. But I understand that in talking in the large majority most of the companies we're working with, I don't know of one that does not have some cloud footprint. A lot of them work in a hybrid model, but for some reason some still want to have some things on-prem while some are completely in the cloud. So, people have adopted the cloud, right? So, I'm not making that prediction for 2021 like electricity is going to take off, right? What I am saying is that 10 years ago, eight years ago, five years ago, coming to the cloud meant some of your best architects, you know, had to roll their sleeves up and develop complex solutions in the cloud. They had to take advantage of new architectures that were really the same design patterns but implemented in new architectures and new ways.

But there's some risk involved in doing that because you're creating a lot of the plumbing and infrastructure type code. We've gotten to a place now where cloud is so mature that there's dozens and dozens of frameworks that do that for you. So, in a lot of cases, you can just do configuration as code. And this means a lot of things. If you're doing application rationalization and you're trying to go from three different platforms down to less, you can look at Software-as-a-Service like Service Now, Salesforce, or Workday using force.com from Salesforce to put some things on that platform. You'd have a much smaller, tighter set of architectures that you're deploying applications on that are robust, trusted, super sound architectures in the cloud. And a lot of that can be configuration-based as opposed to having to develop everything from scratch.

The second thing generates great impact is now you don't have to have your top developers doing that infrastructure work. They can be solving really difficult business problems focusing on the algorithms and Machine Learning models, et cetera. And some of your strong business analysts who maybe have some technical background can start doing configuration in the cloud and start adding value in that tier. Whereas before it might've been a little bit too complicated or a little bit too close to the metal for them to be effective in that role.



Dennis:

Let's take an example because I always find that helps. If we think about healthcare as an industry where they've gone through massive change recently, how have you seen that change, or do we predict that change to be manifest in 2021?

Vinnie:

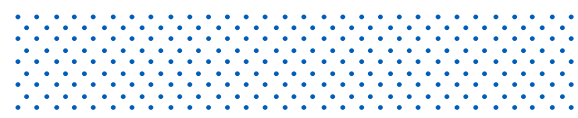
For cloud and healthcare, to me having APIs that are available to collect all the information and have all the end points available to all interested third parties are important. And skating the very complex technical environment, obfuscating that complexity behind a well-structured cloud-based microservices tier allows for flexibility, adaptability, and agility to deliver new services and functionality quickly to your population. So, from a, from a healthcare perspective, I would lean to the more traditional benefits of the Cloud.

Dennis:

And doing so in a way that's HIPAA compliant and meets your regulatory concerns with any of that kind of data. That makes sense. All right. Let's jump ahead. Number three, "C-suites will embrace modern delivery."

Vinnie:

So, you probably heard me get on my soap box a couple of times if you listen to these podcasts before. When it comes to modern delivery, everyone has some level of dysfunction in terms of being on a modern architecture, both data and application, or modern methodology, or modern DevOps. No one's perfect, I guess is the way to say it. Understanding where you are in that maturity curve really helps. The problem that we see often is misalignment. People have different definitions within an organization across business units of what Agile means, how it should be implemented, how the team should be structured, or how enterprise architecture should fit as a guild with cross cutting concerns. That makes it difficult to predict velocity and accurately estimate story points to deliver reliably. Right? But you're the agile expert so you'll fill in these gaps for me. But one of the things from a COVID perspective was that organizations that figured this out also had the side benefits of empowered teams, teams that knew how to do estimations, teams that knew how to overcome roadblocks independently and that had decision-making power.



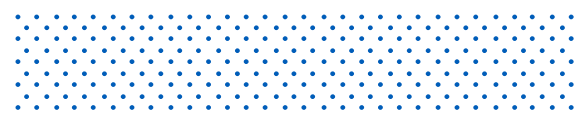
That lesson has now been learned by a lot of other companies who've had to force themselves into modernizing their methodology because of so much remote work. And they're starting to see the benefits of that. So that adoption, growth and the maturity of methodology, DevOps and architecture has to continue for these companies, or they will lag. A lot of that really is hard work! It's not an easy thing to get people to agree in an organization on how these projects should run, how the teams should be built and what the different terms and the methodology mean.

Dennis:

We're a lot further along than we were a few years ago. If you look at the [State of Agile report from 2020](#), there are not a lot of organizations saying that they haven't already adopted some aspects of agile. In that survey, 95% of respondents said, "Yeah, we're practicing agile," but then you start to see differentiation where 76% had DevOps in place and only 35% had moved to any form of scaling where you allow your teams to work together on big programs more seamlessly. So, it's not about saying, "Hey, we're agile. We practice scrum at the team level." But thinking about how an organization can be more agile, flexible and pick up some of the methodology and frameworks that allow you to chase ROI in a more efficient way. I think that I agree with your premise that that's going to continue rolling next year.

Vinnie:

Well, in the last 20% it gets increasingly harder. I don't know if it's logarithmic or a square or whatever, but it's like when you try to charge a Tesla battery or any battery for that matter. The first 70% to 80% is fast. If I was able to charge to 70% in an hour, it still may take me six more hours to get to 100%. So, organizations can say, "Yes, we're implementing Agile. We're doing DevOps. We're doing these things." And they're 80% of the way there because they do have teams doing it. They are having some success, but that last 20% of really being a mature shop has huge value. It's also a huge lift because as you get closer percentage wise it's more subtle and more difficult to close that gap.



Dennis:

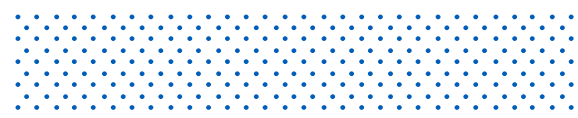
Yeah. The low-hanging fruit is long since eaten up and gone. And you're looking at entrenched culture process and mindset changes, and those are just difficult to overcome. Change is hard. So, when leaders embrace this kind of change, I think it makes sense that we'll see an acceleration of the kind of outcomes that we saw in 2020 from a certain population of organizations that really rose to the occasion. Organizations have to empower people. They have to encourage more iterative learning and more experimentation. You talked about failing fast, a hundred percent. You build it, test it, assess it, and move on if it's not working. So, I think one of the other things you talked about was the "minimum lovable product;" can you talk more about that?

Vinnie:

Yeah, sure. Minimal viable product has been the term for so long. The reason why I like the word lovable in there is it speaks to the human aspect of it. Where we really believe that from a digital transformation perspective engaging honestly, directly, and authentically with the user is what helps establish brand loyalty and repeat business. So, it's not necessarily about having 100% of the functionality in the early releases, and you could talk about minimal viable product in that way. But from a minimal lovable product, you want to make sure that even the first things you're putting out really are engaging. Some of that's design and brand standards, but a lot of it too is this integration of all the technologies we've spoken about. So, if I am asking a smart speaker or a question that's running through your services, and then I pick up my phone to do something with your app, it should already know the problem I'm trying to solve. That experience should be so seamless across this omni-channel platform. If I then make a request on the chat bot, it shouldn't ask me what my problem is. It should say, "Oh, here I see you're working on this issue. Right?" So that seamless integration of user experience is the lovable aspect of it. There's surprise and delight when you talk about things that you don't expect to happen like that. But from our independent research, those things that are technical innovation are embraced and loved as they serve a functional purpose not as a standalone item.

Dennis:

I think that's the connection point here; that we want to be iterative in our delivery, but we



also want to fund and support products that work and thrive and not be afraid to prune off what isn't working. Well, we got one more here. Number four, "Rising user expectations will continue to impact customer loyalty." How are we going to captivate our customers moving forward?

Vinnie:

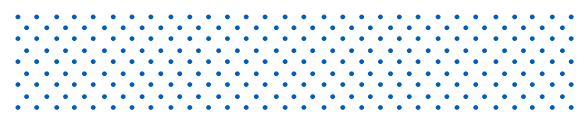
So, there's the obvious and then there's a little bit of vagueness after that. The obvious thing is what came out in our [customer survey](#), as well as the way it was phrased, which I disagree with. The way it was phrased was that brand people don't have brand loyalty anymore. That that's dead. I don't think that's necessarily true. I think people care about brand every bit as much as they did before. However, I think the factors that impact how you value a brand have changed. So, there's a change in expectation from customers that if you don't follow, they're not going to like you the way that they used to. Their expectations and what they value in a brand has shifted under your feet. One of the first ones that we've seen, that's not surprising but interesting, is sort of a social mindedness about this. Customers care about how a brand or an employer treats their employees. If you're going into a grocery store, a restaurant, or even a state government building, and at a time of COVID, and the employees don't look like they're in a safe environment, Or, that they're not being treated well. That impacts the brand greatly. So, you wouldn't think that how you treat your employees has a direct and measurable impact on brand loyalty to your customers, but it really does.

Dennis:

Social awareness is big. And I think our criteria changes.

Vinnie:

It did. And also, things like customer service have often been thought of as human touch points. We learned this pre-COVID. We were working with different hotel chains. And I noticed this as a business traveler. There was a point in time when the person helping you check into the hotel was behind the counter. And then at some point in time, it switched to them walking around the counter to interact with you directly without that physical barrier, trying to increase customer service. But in fact, it's creepy. It kind of breaks a social norm when I'm expecting there to be this desk between us. So, what's happened with COVID



now is real expansion of that. People don't want you interacting with them face-to-face. They want curbside pickup. They want contactless delivery. They want more voice-based smart speaker services. They don't have to go somewhere and talk to a physical person. So, doing that well while maintaining your corporate voice, and still making it a fun and enjoyable experience, is really important. But how do you do these things without it being sterile? How do you do these things while still demonstrating that you get it? You still want your customers to feel part of something, right?

Dennis:

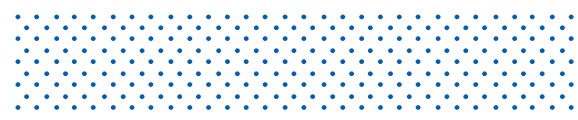
Yeah. And just a quick reference for our listeners of the survey you referred to, it's called [Captivating Consumers During COVID-19](#). We conducted this survey, and we have a paper out if anyone's interested. I think there were some good metrics in there. If you know, 72% of consumers are now comfortable with new tech, that is a greatly increased number. We're all having to move into this world, but the other things you talked about around safety and cleanliness now being part of brand definition and the way you're a socially aware organization and employer, it's all now a part of your brand. Additionally, convenience. We've all been trained in this period with our buying patterns and motivators for buying have completely changed. It's not going to go back anytime soon and often these changes become a lot stickier than you think they might be.

Vinnie:

Yeah. One thing we found in that survey was that consumers are much more willing to try a competitor now than they ever have been. And that does suggest that brand is less important as mentioned before so I'll give that some credit there. But if you don't feel safe going somewhere, you will go somewhere else. If you don't think that someone has your values today, you'll go somewhere else. And that's been a huge change.

Dennis:

Yeah. I think that's the important distinction. It's not that brand is no longer important because it is if I'm choosing between a brand I know and a brand I don't know. The brand I'm familiar with typically wins unless there's one of the other criteria that's out of whack, but it's less important than it used to be. Now it's about all these other factors we talked about.



It's about the convenience and it's about the experience. How easy can you make this for me as a consumer?

Vinnie:

See, I argue that is still a brand play. That those things, because it's shaping your opinion and how you feel about a company, that becomes part of their brand. So, it is semantics and it's subtle. But that's sort of the point I'm trying to make —that brand is every bit as important as it was before. It's just the ground has shifted underneath it.

Dennis:

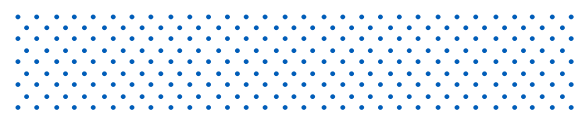
I've changed that, thank you. That's actually really interesting for me, because I don't normally think of those things as brand. But your logic is sound. We're all seeing it. That the way we define the accompany has a lot to do with our impressions of them, our experience with them and in different ways than we're used to.

So, let's wrap it up and talk about from a conclusion standpoint. We're starting to see that the trends that we're in, that were moving forward before, there's nothing that new this year. What we'll see is an acceleration and deepening of some of these trends seen before.

Vinnie:

Yeah. If I was going to bring it down to three words it would be acceleration, maturity, and amplification. A good example of amplification might be this: if you have a small wave in the ocean that comes by, you jump it. If two small waves come by, you jump those too. If those two waves hit at the same time, you might have to jump higher. And so, putting multiple waves together gives you massive wave. That's amplitude. When you look at technologies like Machine Learning, voice and IOT, it's not about those individual waves. It's about them hitting at the same time, at the same moment for a user and creating that amplified effect of a really positive user experience from an acceleration, integration, and maturity standpoint. It's that last 40%-20% of maturity that most people are in now.

So now it's about getting tight. Think about a sports team. You have all the players on the



field or on the court. Now it's making sure that everyone is crisp. They know their position. They know how to interact with the other players and the coaches and they're executing at a high level. You can't just have cloud and a couple Software-as-a-Service and think you're done. It's those players on the field. How do you make sure that the players on the field are executing at a high level?

Dennis:

Right. You need to execute at a high level, but you also have to close that 20%. Everyone is racing for that 20% right now. That's right. Get there first. The other thing I took from the paper that—just to get your opinion on to see if I'm reading this right—is that all of these things are accelerators. They're all trends that we've seen recently as differentiators for organizations, but even with more so with complete data, truthful data and genuine innovation. That's still the only way to continue to thrive and please your customers. Did I get that right?

Vinnie:

I would agree. And I would say consider innovation in the broad sense. A lot of times people think of innovation in a small technical sense of a new technology. That's doing something that wasn't done before. And while that is innovative, there's a lot of processes that are also innovative. There are a lot of user experiences that are innovative. Also, the way that you can connect with and transact with people can also be very innovative.

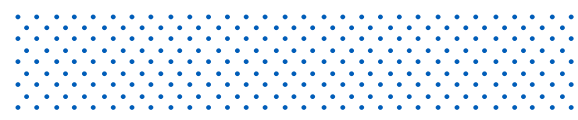
Dennis:

Innovative products aren't just limited to tech. Right.

All right. Well, thank you Vinnie for your time today and for walking us through this. We will have in the show notes links to both of the articles we listed as well as we'll have a link to your paper for 2021 trends.

Vinnie:

Thanks Dennis. Appreciate it.



Dennis:

Thanks everybody for joining us. If you haven't had a chance, please go ahead and subscribe. And that way you won't miss any of our future episodes, and we will see you next time.

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