



Digital Aspirations in Education Podcast – Series 1, Episode 2

IoT in Education: Connected Buses and Smart Cities

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Jared Heiner: So, welcome back to the next installment of the Aspire Technology Partners Podcast where we're focusing on education. If you heard us the last time, I was on with Dr. Lance Ford from Cisco, as well as Brian Schillaci, who is also a colleague of mine at Aspire Technology Partners. And I've invited Brian back. Brian is a client engagement architect for Aspire. He specializes in IoT. Previously, he was working as a technical solutions architect for IoT at Cisco. Prior to that, he was a Systems Engineer at Cisco. Before his tenure with Cisco, he worked in education as an information technology advisor and telecommunication specialist at one of the regional information centers. So, we're really, really fortunate to have him with us today because he brings a tremendous amount of experience when it comes to all things education-related, and IoT is on the front and center. Brian, how are you?

Brian Schillaci: Good, Jared. How are you?

Jared Heiner: I couldn't be better right now. Although, let's just cut right to the chase, Brian. We are in the middle of a situation where a lot of folks are working from home, especially in the education field. We've got a pandemic going on, and it has changed everything that's going on from a technology standpoint and education standpoint. And I'm sure you're probably seeing a lot from the Higher Education standpoint, and the K-12 standpoint. What are you seeing through your lens?

Brian Schillaci: Sure. Active projects have shifted to remote workers and helping remote workers get access securely to resources that they use day-to-day. So, I have shifted my focus as well, and I'm helping customers do that. As an example, an IoT project that I'm working on

now with a city, engages them and the local school district on connecting students without access to the internet. I'm focused on those types of things around connectivity.

Jared Heiner: Brian, you've probably been engaged with both customers at some point in time, meaning the city you mentioned. Obviously, the school is in the city. Has this conversation ever come up before or is it the fact that we are now in a quarantine with pandemic? Has that really brought this conversation to life?

Brian Schillaci: It has come up before, and it's always been sort of a nice to have thought. But now that it's a necessity, we're fast tracking a lot of those projects.

Jared Heiner: And so, again, I think part of what I want folks to understand is that the IoT is this almost magical unicorn term. We like saying it. It's become very marketable. But the reality is, and you've said this before, it really is about data, and collecting data, and making it useful. Would you agree with that?

Brian Schillaci: Yeah, absolutely.

Data's Central Role in Education Technology

Jared Heiner: And so, in this time, we're looking at changes in workforce. We're looking at doing business differently. We've left some of those physical structures. How is data taking a front and center role? And what can I do if I'm working in education, whether it's higher ed or K12, to say, where is the data? Where am I looking?

Brian Schillaci: Today, we're working with healthcare providers to track COVID-19 test cases. We'll help fast track them to see a doctor rather than send them to a hospital because they're sick. From an education perspective, we track whether the school has tracked students without internet access. We'll take the data about students without internet access to a city, maybe, and use it with any type of data map the city has, and we'll plot how to find areas where we could populate wireless access coverage for those students.

In the future, I envision using data with different systems to make informed decisions about student access, student safety, and student health. We're in the midst of a crisis now so we're rushing projects.

Jared Heiner: It's interesting because the Smart City Project that you've been working on is something that's been there for a long time. I think it would surprise people because no one really anticipated ties into education, but, now, we're looking at those students without connectivity and applying it to the Smart City concept. Once you go down that path, supporting those students will be easier because you've set this up.

Brian Schillaci: Absolutely, absolutely. The thought now is 'let's create a separate network for those students.' Today, the school district fiber-optic network is not connected to the city's fiber optic network. So, we can accomplish connectivity between both networks through VPN tunnels. Once set up, they could use it daily or turn it back on if there is another crisis.

Jared Heiner: So, I'm going to go back to the piece of the equation that I always go back to, having worked in education, and this is for most industries: we tend to solve the problems that are sitting right in front of us. If someone had said to me, when I was working as an IT director in a school, "Hey, you know what? Let's go have a conversation with the city and see what we could potentially leverage." That conversation is going to go too far. You've probably had more experiences in your role here at Aspire Technology Partners of being able to go out and say, "Hey, here's how we engage. Here's how we connect." So, my question for you is, how does that process start? Because it's a big leap unless you're sitting in front of a pandemic.

Brian Schillaci: It's all about having multi-service network architecture and multi-service data platforms, so that when I'm solving a problem day one, I can anticipate issues and plan for them. I want to solve problems with multi-service architecture and data platforms instead of starting over again. When we work with a customer, our approach is to solve specific problems and then ensure that the infrastructure will solve future problems.

Jared Heiner: You'd be able to assist when those problems appear. We want to make sure that we're being mindful of data protection. We want to be mindful of cybersecurity. You can cover all of that.

Brian Schillaci: Exactly. That's one of the core components, and one of the first components that we tackle before getting into any sort of solution. First, we understand what the business outcomes are, what's important to the customer, and then we start with security and build from there.

Jared Heiner: So, that's very much a K12 environment. I know you worked on the Connected Bus project. Here's another instance where the idea was providing students with access to the internet and, ultimately, their classwork, during long bus rides between home and school. Are we starting to see those buses connected and used as access points?

Brian Schillaci: We are. We're deploying Connected Buses to a couple of school districts that have students without connectivity. The buses are equipped with Cisco routers with 4G connection. It gives Wi-Fi to the area. Students can use 4G connect into the school or directly to the internet.

Jared Heiner: Ultimately, the school still filters the connection with policies.

Brian Schillaci: Correct. Depending on the district, and what they have in place, and what the budget is, we can create a connection from the bus to the school and filter at the school, or we could use something like Cisco Umbrella, and then do filtering right at the bus when students connect to the internet.

Jared Heiner: If I'm working as a superintendent, for example, and I say, "You know what? I'm interested. I know these things exist. I've got to start budgeting." Maybe I've got a one-year, three-year, five-year plan in place. And now is the time to start saying, "Jeez, how are we doing things differently because it could happen again?" Do you have a process that you can walk me through? Because I'm going to reach out and I'm going to say, "Okay. I know that you can essentially help me brainstorm. But are you going to be able to help walk me through what to do from a financial perspective? Because we all know I'm going to be making investments every single year to invest in my IT, but are you going to be able to help walk me through what this looks like to expand into that world of IoT?"

Brian Schillaci: Sure, absolutely. It's specific to what we're doing with the coronavirus today. If we're prepping for another pandemic, I would think about "lessons learned." What did we encounter when we went through the COVID-19 pandemic? What can we do differently? If we do put something in place, what other problems can we solve with technology? We want to think about other problems beyond the immediate one. We walk through everything from the business outcomes, the lessons learned, and the solution design. What else can it be used for? And then, of course, we'll put together the budget.

Jared Heiner: And that's great to know because, again, we've had this conversation before on the last podcast. We brought Dr. Ford in. It's hard to look at the silos that have been created in any organization and try to pull them together. It's a very difficult task. And so, again, having a partner out there that's been down that road—you've worked in education, I've worked in education, you've worked in IoT, we're focusing on these pieces--is hugely helpful.

Remote Learning Obstacle

From a Higher Ed standpoint, they shut down and students went home. What are some of the biggest obstacles you've seen with students and remote learning? What could colleges have done differently? And what should they be thinking about in the future?

Brian Schillaci: I would say go back to your business continuity plan, and not really focus on any specific technologies, but go back to your business continuity plan, do that lessons learned, and see what needs to be adjusted there. And then, start talking about solutions. From an IoT perspective, I'm sure that a lot of the Higher Ed institutions wish they had access, remote access, and remote monitoring to a lot of their staff uses from home. From a Facilities and IoT perspective, that's something that I think, going forward, after the pandemic's over, we'll be addressing with many customers.

Jared Heiner: And you just touched on something interesting, whether it's Higher ed or K-12 facilities. We know IoT takes the facilities piece and ties it together with the technologies piece. Talk a little bit more about some of the latest and greatest from a facility perspective. I know there's lots of different monitors out there. I mean, the pandemic alone has brought us to an interesting place. We're starting to see sensors for germs, correct?

Brian Schillaci: Correct. I think we'll see a lot more monitors, not only for germs, but for patient health monitoring and things like that. Did somebody have a fever? Are they exhibiting some symptoms that are consistent with the symptoms of a certain virus? The technology exists. We need the technology to make sense for the customer and what the problem they want to solve. From a facilities perspective, quarantine type technologies are still up-in-there, but there's already a lot out there—everything from sensors to video analytics. I always return customers to what they have in play today, their problems, and the best way to solve their problems.

Some of the things that we're doing in facilities is just basic connectivity. I mean, a lot of these systems aren't connected at all. Once they're connected, now, we can start gathering data from those systems and bringing them into a single platform for visibility, and then create a workflow to notify first responders or notify facilities. So, it's about the connectivity, and the workflow, and the data that we're gathering.

Jared Heiner: Originally, the question was, 'how do we create networks for individual structures?' This is a mind shift, right? We're no longer building infrastructure for organizations. We're building infrastructure that connects anything and everyone.

Brian Schillaci: Right. I mean, if you think about it, networks were built to support computers - computers and maybe servers back in the day. And that's where we focus. With IoT, we're adding all these different sensors. If you think about any problem that K12 or Higher Ed experiences, there's some sort of technology and connected sensor behind the technology that could solve a problem. And now we're adding those for the network. We need to focus on security more. All these connected devices have broadened the threat landscape.

Organizations use a plethora of technologies, which need to be configured to secure their environments. New technologies emerge already configured. For example, Cisco acquired a company named Sentryo one year ago. They made a sensor, like the Firepower firewall, that can be used in rugged environments. The sensor knows industrial protocols. Technology and industry were tied together. The result is a comprehensive security overview of the network.

We want to concentrate on security as much as we concentrate on developing technologies for enterprises and operations. New IoT tech is coming. We need to secure it.

Jared Heiner: You made a great point, Brian. You said this stuff is coming one way or the other. It's going to be here. It almost sounds to me like I need to start preparing for this because I'm going to be the person who ends up running an organization that has too many dashboards or too many siloed systems, and I'm going to put myself in a situation where I'm overworking my staff, and I'm not going to be as efficient as I want. So, the planning needs to happen now.

Brian Schillaci: Exactly. I can imagine that the manufacturers of some of these sensors, along with application developers, will use the quarantine as an opportunity. We see organizations with all these systems that don't talk to one another. A lot of that exists today. I see it all the time. It's important to have a trusted partner that can lead you through the process, and make sure that you're making the correct decisions.

There's not one type of management platform or operation dashboard that an organization can use for everything. If there's a company out there saying there is, they're not offering a realistic solution. You're always going to have a couple of different go-to platforms, but the trick is to minimize that, and to make sure that it's easy to use, and that the platforms integrate. And, at the end of the day, again, I go back to 'what's the problem we're trying to solve? can those systems solve a problem working together?'

Jared Heiner: Well, I'm glad to hear you say that. Obviously, we know that Aspire has the mantra: "We power business and education transformation." Moving in the direction of the initial strategic goal of the organization is what it's all about, right? Your technology is supposed to support your strategic initiatives and move you forward. To your point, we don't want to sidetrack things by heading down a different path. We want to continue down the path of business transformation, of education transformation, and put a mindful plan in place.

Energy Consciousness in Education

One of the biggest pushes in education has been energy consciousness. How can we become more energy conscious? We're in a situation that has impacted budgets. I think a lot of folks are

going to sideline the energy initiative. What's your recommendation for maintaining the energy initiative while remaining aware of the circumstances and the potential for impacted budgets?

Brian Schillaci: Right. So, when we're talking about energy savings, it's about getting in early on any type of existing initiatives or maybe something that's coming. You already have a set budget. Going back to the planning piece, getting a partner like Aspire in there to go through and look at what is being proposed is important. Together, we'll explore where can we save on some of those efficiencies, whether it's installing a traditional light today that might not be LED, or doing LED with network connectivity so we can get data from it and report on the energy savings. For budgeted energy saving projects in which you don't need to retrofit systems, you might need a platform to calculate my energy savings and to control PCs and monitors during business hours and off-hours.

But there are energy grants available to organizations that we can seek on their behalf and then bring them in. When we do that, we'll receive funding to pay for the platform as well as funding to pay for more energy efficient solutions, such as building lights, connected controls within a building, or something like that. So, there is money available. It's just about knowing what's available then putting together the request for the grant.

Jared Heiner: I think it's important to know that, because one of the first obstacles is, "Hey, if I'm going to do anything different, I've got to have funding for it." That's going to be the first in any educational setting. Whether it's Higher ed or K-12, the first thing everybody says is, "I'm not going to have money for that," especially if it's something new. But to know that there's potentially funding resources out there, and that you're aware of them, and you can bring them to me, solves a tremendous problem.

Now, I'm going to sit here and say, "Wait a second. You're telling me about all these different sensors. You're telling me about how they come together." I think it's worth knowing that it's not a pie in the sky.

The Aspire Internet of Things Lab, Powered by Cisco

JH: Aspire built IoT Labs in conjunction with Cisco. Can you tell me a little bit about those labs and what I might see if I'm coming in from an education industry?

BS: Yeah, absolutely. We have two great labs - one in Albany, New York that's co-located with the Capital Region BOCES, and one in Eatontown, New Jersey. In those labs, we're able to show Smart City technologies. We're able to show some Connected Building technologies. We can show the security and the network infrastructure around those technologies. We have access to dashboards, which shows you more of the data side of things. We have a bit more space in Albany. So, we're building out some new use cases there.

In both labs, we're working on the Connected Roadway. We'll have the ability to take data from vehicles and make decisions based on the data that we're gathering. It's in the works. We started to create IoT Managed Services that are hosted in the cloud as well. So, both of our labs connect back. We can show what we can do from a Managed Services perspective: everything from street lighting, to indoor POE lighting, and to vape sensors for K-12 and Higher Ed, along with video security and video analytics.

JH: I like to keep things simple when I'm building a new building. Here's the blueprint. Let's go crazy. But the reality is we're probably going to be an institution with multiple buildings, access points, switches, and all those kinds of things. We've repurposed it. In some cases, it has been band-aided. Are you going to look at me and say, "This has all got to be uniform," or is there a way to bridge all these different pieces together? I still want to be energy efficient, but am I going to run out of runway when I find that, all of a sudden, I'm not uniform in my network?

BS: We wouldn't be in business if that was the approach that we took. I mean, we don't want to spend money to spend money. We want the district or organization to take advantage of what they've already implemented. So, that's a definite no. As we're going through and building out the architecture, we'll spot things like a security vulnerability, or another issue in a product, and correct it. We'll help the customer throughout the process. Ripping everything out and replacing it, though, is an injustice to the customer.

JH: No doubt. When we start looking at some of these systems and what they've been doing, there's a value and a validity to why they're there in the first place, and it's not just as simple as seeing if there's a replacement. It may not be the case.

What did IoT learn from the COVID-19 pandemic?

I'm going to throw you a curveball here as we start getting to the end. We are in the middle of a very difficult time right now. Everything has changed. We've got folks that are no longer on campuses. We've got professors that are using multiple tools. We've got students that are home. Everything's changed. Take a guess. What will we say, when we walk away from this scenario, about what we need to keep, what we need to be mindful of, and best practices? What do we learn from this scenario when it comes to IoT and what we should be looking at?

BS: I'll just put on the hat of a superintendent or an IT director within a school district as an example. I'm going to go back and say, "what was my plan?" If something like this happened, whether it was a virus or the school burnt down, what was my plan to continue the learning for the students, for teachers, and administrative staff, accessibility? And if I didn't have a plan, or the plan was never tested, I'm going to start there. I'm going to go back, and I'm going to create a plan and make sure it's bulletproof; and then I'm going to make sure that, twice a year or three times a year, I test the plan.

Of the technologies being deployed today that I think will stick around, one is WebEx. We've been busy with getting customers on boarded with WebEx. Video technology has benefited the first responders I work with. They use video to do staff briefings or to communicate with the public. I think video technology will stay. Many organizations took advantage of the opportunity to implement security tools as part of project ramp ups during quarantine. More security helps protect organizations and institutions as they add more devices to their networks. Customers deployed Cisco Umbrella and Cisco Stealthwatch. I think those will stay in place. Everything from remote VPN connectivity to site-to-site VPN with remote work type appliances will stick around as well.

JH: Well, then, you've certainly brought up a tremendous amount to think about and digest. The game has entirely changed. The idea of searching for data has become hugely important

because folks can't see each other physically. We've left the buildings. So, how do we monitor those buildings? That's going to be a big question moving forward.

To your point, we need to have a plan in place. We also need to be able to connect, whether it's socially, emotionally, or academically with the students. We need to secure the connections too. I think that you've hit the nail on the head.

It's always fun to have these conversations. Cisco came to Aspire Technology Partners simply because we could have these conversations and really dig in and roll up our sleeves and power education transformation. It's exciting, and I can't wait to have you back to talk further.

Brian Schillaci: Excellent. Thank you for having me.

Jared Heiner: My pleasure, Brian. Take care.

Brian Schillaci: All right. Take care.

Jared Heiner: Thank you for joining us on the Digital Aspirations in Education Podcast. I look forward to seeing you on the next episode.

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