The Sinclair: First All-Digital Hotel Experience

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Customer Spotlight Webinar

Mary Killelea: Welcome everyone. Thank you for joining us for Intel's Customer Spotlight Series. This series highlights innovative industry leading companies that are undergoing digital transformation, have tackled business and technology challenges, and created new opportunities using Intel data-centric technologies and platforms. Today, we are excited to welcome Farukh Aslam, CEO and President of Sinclair Holdings LLC, for a conversation on the digital transformation of The Sinclair. Today's host is Lucian Fogoros who is an IoT industry influencer and advisor that works with enterprise organizations. Lucian, I will now turn it over to you to kick off today's conversation.

Lucian Fogoros: Thank you Mary and Intel for the invitation to moderate the panel. I'm Lucian, I'm the co-founder of IIoT-World, the first digital publication focused on industrial IoT. Our mission is to help you create a culture of innovation and connect with smart industrial technology centers and CxO decision makers. Today, we have a special guest Farukh Aslam, the CEO and President of Sinclair Holdings. I recently met Farukh in Orlando during the Gartner Symposium.

Before we get started, I want to give you a little bit of insight about our speaker. He's a commercial realtor, a real estate developer based in Fort Worth focusing on hotels, office buildings, and upscale apartments. In 1999, he started a telecom infrastructure and focused on voice over IP when it was still in its infancy. At that time, he started a company overseas to set up Asia's third-largest fiber-to-home network which today has grown to over 800 employees.

Lately, he's focused on digital buildings and IoT in the commercial buildings entirely for use of Power over Ethernet technology. He's working very closely with LG, make up the 55 LED TV and inside building AC units to also be powered using Power over Ethernet, or PoE, along with other pilots such as a window motor shade, digital mirror, and PoE powered minibar with a multitude of lighting designs. Farukh also owns the only UL-924 rated lithium-ion battery in the world that has replaced the diesel generator for emergency backup building power.

Now, today's session around Sinclair Autograph Hotel, over the next 45 minutes, we'll get some insights on how to create the next-generation digital hotel. Farukh will share his vision for the hotel, the future of Sinclair Holdings leadership, and innovation in use of IoT technology or Internet of things technology to deliver exceptional services. The Sinclair in Fort Worth, Texas is the first of its kind connected to everything from smart to more sustainable and efficient building operation, to in-room environments, to personalized experiences for its guests all through innovative technologies. Farukh will speak on the use of Intel's IoT functionality to transform Sinclair's operations and customer value.

Welcome Farukh and can you tell us a little bit about Sinclair Holding Hotel? I know this has been your passion project when it started. How did it begin and where is it today?

Farukh Aslam: Thank you Lucian for your introduction. Sinclair Building was actually built in 1929, and it was built as an office building in downtown Fort Worth. At the time, it was the tallest building and was the first building with building elevators and also the first building with air conditioning in Fort Worth.

Actually, when I bought the building, the original elevator equipment was still in the building. Some of that was upgraded but they never removed the original equipment from the elevator room. And also, the original air conditioning chiller unit was still in the basement of the building, and since then they had brought in two more chillers. So, it was pretty nice to see how much we have come forward in those technologies both in elevators and the chiller system.

The other thing I saw was the building still had its original electrical switch gear, the main breaker panels were still original from 1929, Westinghouse, and the building in 2013 was still using the original infrastructure. So, it's pretty fascinating. We were able to preserve them and save them in our ESS room for our lithium-ion batteries just to show the history of the building. So, it's pretty fascinating to see that. So, that's the beginning of the Sinclair project. We bought the building in 2013 and decided to convert that into an upscale luxury boutique hotel. And we looked around and saw Marriott Autograph to be the most appropriate flag for our project, and that's the beginning of the project.

Lucian Fogoros: Thank you for sharing. That's taking a ninety-year-old building and digitizing. Now, let's talk about some of the challenges and opportunities you faced in the beginning of this digital transformation of the hotel.

Farukh Aslam: So, interestingly, in 2013, we had no clue about low-voltage infrastructure. I was finishing a project... actually, I had started construction on another Marriott Hotel ground up, a five-story project 20-minutes from Downtown Fort Worth and that was the lead goal project. It had a dimming panel, a 46 Ohm dimming panel. And when... at the end of 2015, in the beginning of 2016, when we're ready to open the hotel that digital... that panel did not work properly and the vendor, in this case, it was Lutron, was not able to help us debug what was wrong. And the panel is still there, it just doesn't work. It was very frustrating. We had 100% LED lighting, and we were not able to control what it was designed for.

So, that gave me motivation to look around for other options, and in that research, I realized that every LED light made in the world is actually a low-voltage, low-power device. Yet we use AC power to turn these lights on because we have an AC-power infrastructure in every building. So, nobody actually challenged to change that AC-power infrastructure into a low-voltage DC power. That was the beginning of looking into it.

In the meantime, Sinclair was being designed as a hotel, and by 2015 the design was complete with an AC-power infrastructure. And now I put that on hold while I'm doing my research on this low-voltage DC power and the first thing we did was we used transformers, AC to DC transformers and converted AC power into 24-volt DC just using stepdown transformers. That wasn't a good idea because transformers... we had to place a lot of transformers everywhere in the building and we yet could not control the lighting. When I say control meaning we could not dim them in zones that were not occupied.

So, one day, my office phone rings, and I'm looking at the screen and it lights up, and it dawned upon me, we have power coming in these Ethernet cables. And of course, I was in the middle of VOIP way back around 1999, so I knew the technology very well. So, I Googled "is anybody using PoE power to power lighting?" And I came across Cisco was experimenting with doing lighting with PoE power.

I approached Cisco. This is summer of 2016. And by the end of 2016, my neighboring office building, neighboring to Sinclair building, we had already installed on three floors LED lighting powered using PoE power, and that would be about 30,000 square feet. Today that building has CVS as an anchor retail tenant in two floors that run on PoE power as well as digital electricity which I will give some more [detail], elaborate on that later.

So, in 2016 fall, we were learning so much about this that we said, "Okay, we will try this at our Sinclair project also." In the meantime, we had bids back if Sinclair wants to be built as an AC-powered lighting system. So, when people ask me this question on ROI, "Did I have to invest extra money to do this PoE powered infrastructure?" The answer is no because I have both numbers in my head. One from an AC-power building and then we peeled the layers off and started bringing low-voltage DC power not just to lighting. We have over 750 window shades and drapes, all those motors are PoE powered. We have minibars. Every guest room has a minibar. We have 164 guest rooms. All those are using PoE power as well. We have very fancy bathroom mirrors which have an infotainment system which can play your TV channels, it can give you information, and it's very cool stuff that all runs on PoE power. And the learning was so fast that we met with our LG engineers and [inaudible].

I was in Seoul multiple times in the last four years and we agreed to make future LED TVs on my next project, up to 55-inch LED TVs to run on PoE power as well as all of the air conditioning. We have air conditioning that inside module that go in a guest room, in your lobby, in public spaces, and run on PoE power. That's what we're working on with them and making a lot of progress in that area as well.

Lucian Fogoros: Thank you Farukh for that. That's great insight for nearly embarking on a digital transformation journey in hospitality. Let's talk about some of the technology used to solve that problem, perhaps some of the data analytics or location-based, in personalized guest messaging. If you don't mind getting a little more in-depth.

Farukh Aslam: Absolutely. So, we are of course, now we generate a lot of data. When you are connecting a device on endpoint using PoE power, you are not only providing power to the device or to the endpoint, you're also exchanging data. So, we can get real-time information on power consumption. We can tell the light to dim down, we can tell the light to go up on power, we can change the color on the light depending on how we program it. So, this is pretty fascinating. I hosted several federal government agencies last summer, early summer in my office. We had officials from GSA, DOE, and the four national labs. And I think it got very fascinating for them to see the results we were getting.

One of the byproducts using this technology in our neighboring building is we were seeing power savings of up to 40% because we've owned the building for more than 20 years. So, we have a history of units of power consumed per month, and we were able to do a comparison. And this is a combination

of both LED lighting as well as air conditioning. So, we removed our chiller-based tanks with VRF air conditioning, which is very, very energy efficient. So, those are some of the learnings.

As far as data is concerned, all this data that we're generating is... Intel is now helping us learn how to use AI to process this data because in order to bring AI into our commercial building project, we need to have a lot of data. And that's what we are... that's another byproduct we are seeing now with all this data, we can bring artificial intelligence to write a new BMS (a building management system) or we also use the term digital twin that's ground up IP based system that takes all this data and starts acting based on the space you know? If it's an empty space hasn't been occupied, it can turn off the lights and make the AC temperature go up in the summer or go down in wintertime to save energy. That's hopefully what we'll accomplish now.

Lucian Fogoros: Thank you for that. Now, 40% energy savings—how much of an ROI would anyone need for that? Thank you for the insight with the government as well as the roadmap with the technology.

Now, can you talk a little bit about your relationship with Intel and perhaps how some of the Intel partners such as Cisco already helped you with the solution? And perhaps, what's the value of this partnership?

Farukh Aslam: So, we approached Intel about two years ago. I would say exactly two years ago, January of 2018. We started talking with them about location analytics. So, Intel brought SaaS and Cisco's Meraki division to the table. So, we have installed over 200 Cisco access points all over the building. There's one in every guest room, there are several in our public space area. And with SaaS and Intel partnership now, we are able to identify guests in different spaces, registered guests, I want to use the word registered guests. So, if your cell phone is on and on you or in your pocket, we are able to identify you in the space of the building. So, if you walk into our bar, we are able to push a message to welcome you to our bar and perhaps offer a drink special. We can remember what you order, and next time when you come in, we can offer let's say $2 off a martini because that's what you ordered last time. So, this is again, for the first time, Intel has joined hands to do this in a Marriott property, and we're excited to try that out to enhance guest experience. Our whole... my whole business philosophy here in this hotel is to really improve guest experience and wow my guests.

Lucian Fogoros: Got it. Thank you for that excellent insight, and let's say in addition to people trusting technology it sounds like partnerships are key for this journey as well. Now, building on the kind of technology that you are deploying, how do these advancements open new possibility down the road or how can Sinclair take advantage of AI and analytics to improve the customer experience? You've touched a little bit on the drink special but perhaps how to drive efficiency in operations?

Farukh Aslam: You know, I was told in one of the conferences by I think someone at Marriott that their internal study is 30% space in a hotel is sitting idle. That could be meeting rooms or large conference rooms or some back of the house where lights are on, air conditioning is running. Using our infrastructure now, and again, we have also deployed a Bluetooth mesh network in the entire building. Every guest room, public space areas, where it's connected to our PoE infrastructure. The beauty with

this, what we're learning is what we have installed now is like a Christmas tree and we can bring decorations and put on this Christmas tree.

So, the PoE infrastructure is our core infrastructure. Now we have drivers that drive lights, but we can also connect sensors. So, the Bluetooth is one group of sensors we have started deploying. So now we have a mesh, a Bluetooth mesh in every guest room and public space. If a guest walks into the mesh, that helps us identify that the room is occupied. So, housekeeping does not need to knock on your door to make sure the room is occupied. They will see on that system somebody is in the room, and they will not… they'll come back later. They can come back when nobody is in the room, they'll still do a courtesy knock on the door just to double check, and they can go in and service your room.

Similarly, this technology has the potential to do people counting. We can count in a conference room, how many people are using the conference room, how often does it get used? So, all the data we are generating is helping us digest, "Hey, this conference room only gets used twice in a week, and from this time to this time, and there are only six people there." And based on that, we can keep the air conditioning to an optimum level where it saves us energy costs.

And then with PoE power, we can also measure the number of units being consumed by each unit or by each light fixture, by each TV, by each AC unit. So, we can actually calculate how much power we are saving. We can actually give it a discrete number, and we save so much power by dimming these lights down or by turning this AC to a higher temperature in summertime. By just going from 72 degrees to 78 degrees, we save a lot of energy.

And then if somebody walks into the space, we can quickly drop it down to 72 and it takes between six to eight minutes for it come back down to that level. So, it's not uncomfortable at 78, it feels warm but within a few minutes it starts cooling down very well you know? But the energy savings are tremendous.

Lucian Fogoros: Got it. Great takeaways on how AI and analytics improve the customer experience and drive efficiencies in operations. So, I want to take to our final question before we give our audience an opportunity to ask the questions. What's next for Sinclair properties?

Farukh Aslam: So, you know, I think this is phase one which we have done, which has installed everything, and the hotel is open now for public. Phase two is taking all this data and being able to process it and create a digital twin. Intel is again helping us train our people on understanding AI and through Intel partners and SaaS partners, we will start writing a code and we will do a ground up new BMS system that's IP based. We want it to be a very simple IP-based system going forward that will then start controlling different zones and all. So, you have to have the infrastructure in place that we can then control. So, phase one is done, where the installation is complete. Now phase two is there are all these devices are connected together with software to process that data that we're generating.

Lucian Fogoros: Got it. So, maybe explain a little bit on the digital twin role there. I want to make sure I understand the role of real-time data feeding into the simulation, making a digital twin. Can you expand a little bit about that?

Farukh Aslam: So, digital twin is a terminology used when you create a BMS you know? Previously we used the term BMS, a building management system. So, today for example, every technology we have installed had its own API. So, if I'm using LG's air conditioning system, they have a state-of-the-art energy management system, they call it AC Smart. Similarly, I had my lighting controlled so I have a very state-of-the-art control system that can manage all my lighting and everything.

We also use a technology that's at the core of everything. It's called digital electricity. One of the slides we had earlier had a rack of board servers which is digital electricity. They take AC power, convert that into DC and then transport that from point A to point B as packets of energy. And those, at that stage, it's Class 2 power. So, you don't have to be an electrician to install that. So, only from the back of that board server is AC input. Then the front is Class 2 power. So, my low-voltage techs can then connect wires into the board server and take it to the guest rooms. So, we have a homerun to each guest room using a speaker cable or 18/2 cable, 18-gauge cable. And that's the backbone of our infrastructure at Sinclair.

So, all these technologies have their very state-of-the art management tools. Digital twin would be taking all these management tools on one... we call it one common glass or on a one central screen where I can input and manage everything. When I make one change, it is reflected across all these different layers and different systems. That's what we'll try to do.

Lucian Fogoros: Got it. So, the one question that came up is how important is server speed and power to your operations and why?

Farukh Aslam: Because the data generated is real time and so much that a fast processing is absolutely needed. Just to give you an example of the Bluetooth mesh. What we do is when you disturb that Bluetooth mesh, we generate data how that is being disturbed. And that has to be compared to stored data. So, we may have 100 different things stored in that file. So, we need to instantly compare that disturbance to what we have in our library to say, "Okay. We have stored previously that if a human being walks through this Bluetooth mesh, this is a pattern of disturbance." And we match this new disturbance to all those patterns of disturbances we have stored, and we can match and say, "Okay, a human being has just walked into the space."

So, now you can imagine how fast that processing has to happen. While you walk in, I instantly want to turn the lights on because I detect a person has walked into the space. So, I can't have a two-second delay to process that information before the lights will be off to turn on. I mean to a naked eye you should not be able to tell that you walked in three, four steps into a room or a space before the lights come on. It should be instantly, you know. As you walk in, first step in the door, the lights come on. That's the kind of... and we test that, and it really works like a charm. We have taken Intel® NUCs quad-core processor one terabyte storage, 32 gigs RAM and we strategically placed them in our building to collect data and process them in these [Intel®] NUCs.

Lucian Fogoros: Got it. So, just explain a little bit about for those listeners that are interested in the [Intel] NUCs, what exactly are they and maybe just give more details about it.

Farukh Aslam: It's a pretty fascinating palm-sized server. It packs so much power that a few years ago, I think you'll have to have a brand-new rack mounted server. The ones I have we were, we were collaborating with Intel to make this PoE power as well. So, it's really... it barely consumes 30 watts of power for a quad-core processor [from] Intel, it could be a [Intel®] Core™ i7 quad-core processor with 32 gigs of RAM. And I think they can go up to 2 terabytes of storage. The ones I'm using are 1 terabyte of storage. I recently got last week my first [Intel] NUC that doesn't have fan, it's a fanless. It has a heat sink at the bottom. So, it can sit in a room without making any fan noise.

So, it's pretty remarkable and then having no fan means my power consumption even went down further. I'm hoping it's under 25 watts of power. I could have never imagined five years ago that I'll have a server with that much speed that will consume less than 25 watts of power.

Lucian Fogoros: Got it. Thank you for that. Now, you've talked about some of the guests, you know they have to be opting-in for data privacy so they can... you can track all of those things. What about some of the guests that opt not to be in... can does your... does your system, how does that work if the guests do not sign up for that program?

Farukh Aslam: So, when we send you the first message to welcome you, it also gives you an option to opt out. So, you can just click on opt out, and we will not disturb you again.

But I mean, let's face it, we do generate data. I mean you walk into a lot of places today, retail shops, they do pick up. It's a technology that's been around for a few years now. We can read your cell phone ID and match that cell phone number if you are a registered guest, or a registered shopper at a grocery store or at a Home Depot or something. So, they can pick up those. I mean you can sit in a stadium with 60,000 people, and they can read your cell phone number if your phone is on and push local advertisements to you. You know they may have a lunch special to announce or something.

Lucian Fogoros: Thank you for that. So, this transformative technology and applications being played out on hospitality, obviously you've showed some great insights there, what other industries do you see benefitting from the same technologies and innovation?

Farukh Aslam: So, you know we started testing the digital electricity portion was so fascinating and working with them, they are now also able to add data to their energy packet. So, it's also a PoE power. Meaning I can use an Ethernet cable to transport digital electricity from point A to point B. And basically, it's 336-volt DC power that is going from point A to point B as packets or we should call them pulse power. So, they send 700 packets across in a minute, and then there's a receiver on the other end that collects those packets and gives you a constant DC power instantly. We are able to successfully test kitchen appliances, your residential kitchen appliances, I think 17 so far with LG. That includes your dishwasher, your microwave, your full-size refrigerator, a cooktop, washer dryers, you know your common residential appliances using DE.

Now, DE can transport over so it's a "Class 2 power," rated like a low voltage. So, we are able to power these appliances which gives me hope that one day we can eliminate AC power from within the house or within a building, which means one day could be literally towards the end of this year or beginning of

next year, that's how soon, because this is happening today, these appliances are going to this testing for the last six months and the results are tremendous. A) It's safer to connect to them. B) It even results in more energy savings. We can take a very energy-efficient appliance which normally has the label saying, "inverter-based technology" and power using DE and then result in more energy savings.

Lucian Fogoros: Thank you for that. One other question we have is can you share what drove you to be so mindful of renewable energy Farukh?

Farukh Aslam: You know I am… if I'm allowed to say I'm a big fan of Elon Musk and I'm a big fan of Tesla. I think sustainability is one of his big motivations when he got into this in the early 2000s. I honestly believe our planet should be left in very good shape to the generations to follow. And I think while there's a lot of innovation in our everyday life from smart phones to all kinds of gadgets, to electric cars, I mean I'm a proud person to say I've ordered my first Tesla now.

I think I can see where the millennials, the new generation, is more conscious about environment. They really, really care about sustainable living. I think we have a solution in front of us to make our world a much greener space. These technologies, what's most encouraging, is DE is DC power. We can use solar panels to generate 48-volt DC, store that energy in batteries, wall-mounted batteries in a house, and then use DE which will take an input of 48-volt in those batteries and then convert that into 336-volt internally and power your appliances in your house.

So, we don't have to develop a new set of appliances, they're already here. In this process we have saved all of those losses. So, today, people do have solar panels on the rooftop, but it's converted to AC power using inverters. When you do that, you're losing 13 to 15% of energy to that inversion which comes out as heat energy. So, we have avoided all those losses by generating DC using renewable energy and transporting as DC and storing as DC, without ever having a need to convert that to AC power.

Lucian Fogoros: Got it. Any additional comments that you may have Farukh with the audience with some takeaways?

Farukh Aslam: So, we are sharing this knowledge as I said earlier with federal government. We are formally teaming up in three labs: Lawrence Berkeley lab, NREL National Renewable Energy Labs, and MNCEE Minnesota Centre of Energy Excellence. These are DOE labs.

We'll be sharing our public consumption data real-time with them and let them put a white paper out on their findings. So, it authenticates what we think we are seeing in the field, it authenticates that, and then publishes it out for general public. I know GSA is extremely interested in this technology, but their process and procedure is they need these labs to verify the claim that it saves energy and it's very reliable and very safe, and then the government can adopt these technologies in their buildings.

I mean GSA is the world's largest property owner, I mean they own properties all over the world—the US Embassy is their property, the White House is their property, and everything you can think of is owned by GSA.

Lucian Fogoros: Yes. So, we should expect benchmarking for these energy savings once these laboratories will release their numbers?

Farukh Aslam: Absolutely. Another thing I learned a lot in the last year is the efficiency of LED lighting has really gone to a very amazing number, but unfortunately lights available to us via catalogs and through retail stores are not at all the most energy-efficient lights. We started using in 2016 135 lumens per watt as the most energy efficient LED, and in 2019 January, a year ago, we were testing 220 lumens per watt LEDs. I think the number has exceeded now from that number. We expect to replace our existing LEDs with much higher-efficiency LEDs over the next couple of years and keep improving power consumption in buildings.

And there's few other things we are working on. We have now testing 4500 nanometer lights, LED lights that are proven to be disinfectants in the field. So, it's a blue light, it's not an infrared, it's a blue light and when a guest is not in the bathroom or they have left their room, this blue light can come on automatically and disinfect the bathroom. They can be under the kitchen counters, they can be in gyms, they can be in hospitals. So, I'm very excited to… as soon as I wrap up Sinclair in the next couple of weeks to start creating lights with built-in 4500 nanometer LEDs that will be disinfectants. So, we use technology to make a kitchen space in a restaurant or bathrooms, public bathrooms, to be hygienically very clean and safe.

Lucian Fogoros: Got it. So, your comments about the rapid development in the LED kind of struck a chord and members, Peter, Dr. Peter [last name inaudible] was talking about how development in the LED could solve the world's hunger problems as plants could grow as fast as 350 times. Any comments and kind of how far are we from sitting in a hotel and maybe growing the plant?

Farukh Aslam: I don't know, but I can sure tell you the LED technology is very, very amazing, and they are really making progress at a very fast pace with making them more energy efficient. And I think the more I dig deeper into it, the more I get fascinated. I do know digital electricity and LEDs are used in a huge way in indoor hydroponic farming, or indoor farming, which I'm sure you've heard there's a big trend now, all warehouse buildings on the outskirts of downtowns all over US especially in East Coast are now being turned into indoor farming. So, they can grow vegetables inside, indoors, and make them grow three times faster with 90% less water by simulating daylight using high-luminosity LEDs and digital electricity plays a big role in it. They also use a lot of air conditioning you know. So that's pretty fascinating that we will not run out of places to grow our food sources, and we can now grow them indoors and grow them vertically. That's a great, great technological achievement in the last couple of years.

Lucian Fogoros: Thank you Farukh for taking the time and thank you our guest… our guest Farukh Aslam for sharing your story on the digital hotels and how AI and analytics improves customer experience and drives efficiency and sustainable operations, and interesting insights on Intel's role as trusted advisors on the digital transformations on the first all-digital hotel. Stay tuned for other educational webcasts brought to you by Intel and this concludes our program for today.

Mary Killelea: Thanks again everyone for joining us today. Please look for other exciting Customer Spotlights that highlight data-centric innovations coming very soon.