



## The Deloitte On Cloud Podcast

**Gary Arora, Managing Director, Chief Architect of Cloud and AI Solutions, Deloitte Consulting LLP**

**Title:** The future of edge is here. Now what? Find out with Dell's Pierluca Chiodelli and Deloitte's Rahul Bajpai

**Description:** In this episode, Gary Arora talks with Pierluca Chiodelli, strategic leader for edge and AIOps at Dell Technologies, and Rahul Bajpai, Deloitte principal and U.S. connected edge leader. They explore how advances in edge computing, AI agents, 5G, and data governance are converging to unlock new business value. They discuss real-world use cases, challenges, and design considerations for scalable, secure edge AI—while emphasizing simplicity, lifecycle design, and people-first architecture.

**Duration:** 00:30:42

**Gary Arora:**

Welcome back to the On Cloud podcast. I am Gary Arora, your host and chief architect of Cloud and AI Solutions at Deloitte. Imagine you are running an energy business deep in a remote region, far from reliable connectivity, yet you still need lightning-fast insights and real-time intelligence there, on-site, within milliseconds. Or consider healthcare professionals performing robotic surgeries or remotely monitoring patient health; transportation systems operating autonomous vehicles and managing traffic flow; or factories ensuring worker safety and quality control through automated drones and real-time computer vision. These are some very real, but ambitious scenarios. How do organizations make this possible? Welcome to the future of connected edge, and that's exactly what we are covering in today's episode. I am joined by two incredible guests, Pierluca Chiodelli, a strategic leader driving Dell Technologies' vision for edge enterprise solutions and AI ops, and Rahul Bajpai, a partner in Deloitte who is responsible for the connected edge business for the US. Thank you both for joining the show.

**Pierluca Chiodelli:**

Thank you.

**Rahul Bajpai:**

Thank you, Gary.

**Gary Arora:**

All: let's set the stage with the big picture. Edge computing itself isn't new, it has been around since cloud computing evolved. So, when are we going to start reaping some positive benefits coming out of it, or are we still in an experimental stage, especially now with GenAI and AI agents entering the space?

**Pierluca Chiodelli:**

Thank you, Gary. I think we are at that moment where the things are changing actually. As you said, we see edge computing and edge solutions for many, many years normally dedicated to very simple automation or simple action. Now for sure, with the rise of AI, especially with the new called agentic AI, we see finally starting real results. Companies are using now edge AI to solve real problems like predicting machine failure in factory, and really extending these to also other place like, as you mentioned, hospital operation making our life better. So, I think we are at the tipping point where the AI is really changing the way that we can do, and also not only dedicate to single task but be able to do more complex things that really bring that arrow eye that we have been searching for a long time for edge.

**Rahul Bajpai:**

You bring up such a good point, Pierluca. Today, I think we are seeing a lot of key drivers of growth that probably were not available up until a few years ago. So, number one, real-time data processing. There are so many industries like manufacturing, healthcare, even telecom, that are beginning to rely on edge computing to process data more locally, thereby reducing latency and improving efficiency. We are also seeing some advancements in the hardware and technology stack where the big hyperscalers or the chipset providers are really, I would say, innovating with specialized tech stacks and chipsets to enhance the AI performance and cost efficiency at the edge, which then becomes an easy to adopt enterprise play. From a 5G or wireless connectivity perspective, there have been advancements in the technology, because you see that edge computing applications do require a bit of low latency, high throughput to be processed quickly to drive that decision making. And finally, I think we are also seeing some movement in how enterprises are looking at data privacy and security a bit more carefully so that certain sectors like healthcare and finance that have these, I would say, regulatory constraints and considerations to think about for Edge AI. Maybe we can overcome those and bring that turnkey solution which hopefully then accelerates the benefits that we aim to achieve or largely promises in this place.

**Gary Arora:**

So, we have the technology as you mentioned both in software and hardware, you mentioned novel chipsets and advancements in 5G that are enabling high throughput and low latency. Rahul, you have worked with numerous clients across industries on their digital transformation journeys, what are some of the biggest tactical questions you see executives grappling with when it comes to integrating 5G, edge computing, and connected intelligence into their business models?

**Rahul Bajpai:**

That's actually a really great question. First-hand experience, I have talked to a handful of enterprise clients across retail, healthcare, automotive, energy, and I think some common themes have emerged candidly. So, number one is how, if you think from an enterprises perspective, we have got three big rocks to solve from an operational technology (OT) perspective on prem. Number one, What are my input sources? If I am a retailer, do I have to think about different archetypes stuff like computer vision, 4K camera enabled sensing, or do I need to look at IoT sensing devices? If you are looking at energy utilities, they are thinking about thermal sensors, heat gauge monitors, so on and so forth. So, the one big bucket is just the complexity and diversity of these endpoints and sensors that we need to think through more holistically from a long-term perspective on what those choices should be.

Second, the mechanism of connectivity, am I going to use private 5G, will I be OK if I just use Wi-Fi 6 or Wi-Fi 7 in my facility? Do I have to have a backhaul Ethernet fiber that also feeds some of the devices that need to connect directly with it? So, that's your next bucket of the connectivity mechanism. Then taking information in real-time in very low latency style and processing it locally requires a clean data set. They say, you want to build a data lake, not a data swamp and the idea is to make sure that the data set that we need to derive insights, actionable insights via AI/ML or even GenAI, that data set has to be clean, it has to be correlated, there has to be some analysis done based on what the business outcome or the OKR that needs to get achieved. Those are some of the tactical challenges that our clients continually are trying to solve for, of course, not forgetting that all this still has to be wrapped with the right security considerations and the financial, I would say, goals that they need to achieve from investment and an ROI perspective.

**Gary Arora:**

I like how you broke down the key considerations that influenced these decision trees in addressing the tactical challenges. Pierluca, let me ask you this, in your experience, what architectural changes or design choices do enterprises frequently overlook when integrating edge computing and AI solutions at scale?

**Pierluca Chiodelli:**

As Rahul was explaining before, there are multi-faceted things that you need to solve when you deploy an outcome solution for edge, especially now with AI. I think one of the biggest things that enterprises overlook and architects overlook when scaling edge and AI solution is designed for life cycle. What that means is when we design something, normally we are just thinking about we deploy this. It is easy, very focused on getting the AI model out to the device, but the real challenge is managing then over time, especially if you are thinking that in the area that we live in today, day-by-day, this AI stack, they change every time. So, it's not just to get the things there, it's to how you adjust to the change of the models, of the pipeline, and all of that. So, the real challenge is to really manage these end-to-end solutions over time.

So, that means that you need to plan it for update, version control, retraining, and also rollback in some case. You need to be able to go to a good state very, very fast. So, those are characteristics that enterprise architects need to think about when they try to deploy these new solutions. I think another common miss is, as Rahul pointed out, the data pipeline design. It's fundamental AI and action at the edge, or AI, or computer vision only work if the data are thinking in this strategy. So, companies often forget how much bandwidth, storage, and processing power at the edge and the edge device is needed, not just for running the AI, but to collect clean and sometimes also label the new data for learning. Without that, AI will be not effective. Security is also a huge thing. Enterprise might secure the cloud and the core, but they often underestimate how exposed the edge is.

The edge is the land of no one, you are outside of the wall of the data center. So, it's very important that we look at device that can be put in public place, remote site, or even mobile. So, as we spoke, when the device has 5G and can be on a track and all of that. So, adopting a zero trust architecture, encryption, and hardware-based security is essential. It is actually what we do in Dell with NativeEdge, where zero trust is the base for all of that because otherwise, without securing the solution, you are exposed to all sorts of attacks. Finally, last but not least, we overlook the people. That means, not every edge location has IT stuff. It's very important to recognize that there is no IT staff at the edge.

So, the system needs to be dead simple to install, very dead simple to install. Restart and troubleshooting needs to be always done by remote and be able to do it. Also, the system needs to continue to work in a disconnected state because nobody can go there and nobody can assist there. Think about that if you can plug and play just like you plug and play your device, whatever device you use at home, that they take all the data information that you already have without having a data center style complexity. I think, in short, to be successful at the edge, the architecture has to scale technically, it needs to be secure, and operationally needs to be easy, easy, easy without putting too much strain on the people using it. So, that's really how you can be successful in deploying an end-to-end solution.

**Rahul Bajpai:**

I am just going to add, Gary, Pierluca brought up such good points and the one example literally from last week that stands out with one of our clients, this is not an IT problem, this is truly an OT problem that we have to solve and the client was talking about a remote and harsh environment with an offshore rig and mines where the remote substations have to use those rugged Edge AI systems where cloud access is actually not even available. So, just harnessing that “disconnected” environment’s needs and bringing the solution to cater to those needs, that is probably the gut of the challenge that Pierluca was trying to get to.

**Pierluca Chiodelli:**

If I can on what Rahul was saying, we want to manage the edge as a cloud. That doesn't mean that every context, every situation will be connected, but we want to leverage the same CI/CD pipeline, the same tools that we use in the cloud because edge can extend and it's kind of a cloud in itself, but it's more complex and needs to be adapting to different situations and also can be connected or for certain things and disconnected when it needs to be disconnected. I think that's a very great point that Rahul brought it up.

**Gary Arora:**

So, many good insights here, don't overlook the people, especially on edge where there is no IT staff at hand, got to have those remote starts and rich telemetry with the focus on ease of operations. I didn't realize how important the user experience becomes on the edge. I also loved your insight on design for life cycle, the focus shouldn't just be to get the AI model out to devices, but looking at post go-live operations and maintenance. So much of AI hinges on the rich data, not only in terms of data availability, but also in terms of data quality. So, let me ask you this, with more and more data that is now being processed at the edge, how should organizations be rethinking their data management strategies, particularly around data governance so they can extract those meaningful insights from distributed data sources.

**Rahul Bajpai:**

Pierluca, you want to share your thoughts or should I get started?

**Pierluca Chiodelli:**

Absolutely, I am thinking that, as you pointed out, when we look at the edge and the fact that edge needs to do these operations, data sovereignty is very, very important, the ability to have data close and analyze the data where the data is produced is another fundamental thing. I use this concept of data gravity that is not a new concept, but data at the edge, it is really vital and important if you can analyze that in a very real-time situation and act on those data. So, for doing that, not only you need to have a very quick way to parse the data and understand and tag-in the data and understand what's happening, but also be able to maintain that data that you really care about.

For example, if a model is deviating, you want to keep the things that make that model deviate. In the computer vision use case, maybe the picture that they are showing you of the things that are going wrong and then be able to save those important data at the same time that you discharge the other data. At the edge, we see different type of needs for different type of data management approach. One very close to the real time, so the ability to target the data and take action and also automate this pipeline very, very quickly. The other one, the ability to show and predict change in the environment so that you can act before the things they actually stop. I think Rahul, you gave me a clear example last time when we met where there was this preventive maintenance solution that you guys have. I think that's a very, very important thing to see all this different data that we need to manage

**Rahul Bajpai:**

Yes Pierluca, in fact, I was going to bring that example up again. So, for us, quality sensing and defect detection environment for preventative maintenance, literally everything you summarized became a go for us solve kind of action. But I think what we learned from it, at least from that real example was, let's think about a true architecture that is event-driven. So, instead of streaming all telemetry, only transmit the data when a change or a threshold breach anomaly is detected. So, we are actually being intelligent.

We also employed some hierarchical aggregation where possible. So, analyze data from multiple edge devices before sending it to the cloud or the central control point, use like fog nodes as we can to deploy lightweight models – which can basically infer patterns and discard the irrelevant data. And then some of the contextualization of that data and quality control became super important for us in that same example you were referring to because we started off by creating digital representations of physical assets first to contextualize what that sensor data should be under those operating conditions. And then we were basically helping our client build out that how do you handle outliers, what are the time stamp mismatches, what are the signal dropouts, do I need to do some time series analysis to bring synchronization back into these different data sources.

Ultimately, it's a journey we have to work, like you said, with workloads that are low latency, built for cloud, for model training, historical analysis, so on and so forth, but the end goal like you said is about sovereignty and governance within data. So, how do we make sure that edge devices that are being used are tagging data with context, enabling some downstream traceability, bringing some ML model compatibility so that we avoid specific vendor lock-ins, and at the same time meet, I would say, local data processing or the residency laws as I call them with HIPAA, GDPR, and so on that basically allow the enterprise to manage the outcome or the OT outcome in a more seamless fashion.

**Pierluca Chiodelli:**

I want to double down on what you said the telemetry, the data, and the ability to have almost real time frame, it's very important. Without harvesting the data, you cannot have an effective gain in that ROI that we discussed at the beginning of the podcast. The data is the essence and understand the data in the AI in the current environment is the most important thing because models without the data and the data without exposing to the right data and the right amount of data that cover different use case or different situation will not make successful the model. I think it is fundamental that everything start also with the data strategy.

**Rahul Bajpai:**

I was going to say you reminded me of our conversation in Barcelona where we were thinking about some of the teams and the people side of this data ownership clarity, who owns the machine data? Are they operators, OEMs, or service providers who are able to curate the data sets, who are able to access the data sets, and who can make changes to the models that basically depend on these data sets. So, some of the whole, I wouldn't say organizational, but more functional ownership roles and responsibilities within the organization to streamline the effort probably is also as needed as much as the technical constraints and considerations we were talking about.

**Pierluca Chiodelli:**

Correct.

**Gary Arora:**

Now you are speaking my language, data-driven architecture, intelligently filtering out the data that you need to transport over to the edge to maximize that low latency efficacy. My day job is that of a cloud and AI architect, yet when I hear 5G and edge, I still think of cloud and faster speeds. So, beyond these obvious benefits, what are some of the less obvious but equally transformative capabilities that you believe will unlock the next wave of innovation in edge computing and connected intelligence?

**Rahul Bajpai:**

Pierluca, I can offer a couple of thoughts here and then please add in, if you start looking at connectivity as an enabler for high speed, low latency transmission, and communication between these endpoints and sensors, 5G clearly represents a very, very strong choice for enterprises to consider. The good news is they can leverage our telcos for a public 5G coverage in large venues or autonomous vehicles and so on, there is option to build private 5G coverage on campus where you can have still the high speed low latency network, but then you can establish a neutral host for yourself as an enterprise that allows you to integrate subscribers, basically your own employees to seamlessly walk into your facilities and latch onto your own neutral host using technologies like mock and gateways and so on. So, that's another option.

Third, there are other alternatives in, I would say, 5G would be great, but because of some lead times or cost limitations, we could employ Wi-Fi 6 and Wi-Fi 7. Finally, I would also say that in rural areas where neither a fiber trenching can work or neither a 5G signal is strong enough, you can have edge devices as a connection basically connecting to a satellite link in those extreme cases where you need connectivity but you just cannot rely on Wi-Fi, 5G, backbone fiber, and so on. The good news is all the device sensor ecosystem players are basically trying to get their devices and sensors compatible to different types of access technologies, which will then give enterprises the option to basically bring the mix of these, I would say, vendor ecosystem players to minimize sprawl, to minimize like, hey, I don't need to actually go and pick five different mechanisms, I can have one my primary and one as a backup connectivity mechanism and I can still achieve the low latency, high throughput network I need to connect my devices on edge.

**Pierluca Chiodelli:**

I think, Rahul, you touched on a very important point, it's not only 5G or low latency that you need to be open to be able to use all the technology that is available. If you think about today, you go in certain place and they still use 1 GB, that is the standard that they have. In some case Wi-Fi 6 is a very, very long shot for some other people, in some other case 5G is too expensive. So, the technology needs to adapt. The most important point is not about having the connectivity but to be connected and why that is important because when you establish that CI/CD pipeline, and you need to do that day two operation and you need to be able to bring the new and trained model to the edge in a very effective way and do it securely and all of that, you need to have connectivity and that's, by the way, is why OT and IT they are coming together because you cannot do this without the IT knowledge of the networking from an enterprise side and you cannot do that without attaching the OT network. So, that is also what the AI is a revolution that forced the people to come in together and speaking about how they really connect these CI/CD pipeline.

**Rahul Bajpai:**

So, you have brought something, which again sparked, I would say, memory from another conversation where some of our enterprises were early adopters of edge AI and AI infrastructure have figured out the paradigm shift of bringing IT and OT together a lot more closely, something that probably was not done over the last decade or so and then some other enterprises are we need to get on that journey, but it takes an organizational shift and more importantly, there is a skills gap and a talent gap that is being recognized here because the archetype roles of yesterday are not entirely the ones that we need today and tomorrow, and so they are also on that journey of bridging that skills gap and getting the right ML OPS engineer or the architect who can think data and use case integration and so on.

**Gary Arora:**

That's what I love about the connected intelligence potential, that it's really bringing together a consortium of multiple stakeholders from people to technologies to models. Let's wrap up by looking ahead, what excites you most about the future of edge connectivity in terms of the positive impacts on businesses, communities, and even our daily lives over the next few years.

**Pierluca Chiodelli:**

Let me take this. When I started looking at the edge about six years ago coming from the enterprise background and from storage and building new product in Dell, in Dell we have these things that will say we want to help human progress and be there at the forefront. I can tell you that I am very excited today because I see with this new technology and the new connectivity and the fact that we can harvest the data at the edge, we can really make tremendous change in how people live today. From the most advanced city in the world to the rural area to the mountain, we can really change the thing. We can really consume less, be more conscious about our produce, our waste. We can also build and react very fast and prevent disaster and other things. Just look at the advance in radiology and in CAT scan technology where AI can help you to identify very quickly problems and very challenging things that people may discover months later, now we can find in minutes. Really the future is bright because this technology and the agentic especially where the agent can do their own decision and can instruct the other agent to act on things can really bring this leapfrog better incremental, better life for all of us, a real impact for all our entire society. So, I am very happy and bullish about the future.

**Rahul Bajpai:**

Absolutely Pierluca and for a minute, I am going to take on several personas just to illustrate what I think I would benefit from as an end user. So, I am a patient, I will raise my hand for the next real-time patient monitoring and diagnostic capability that healthcare providers can give me to improve response times and my own outcomes. I am a shopper, I would love to walk into a store, get my personalized experience based on my shopping preferences, lead me to the aisles, I pick my objects, my produce, and just walk out. I am in a car, I would love for my car to give me enhanced safety and navigation, something that I need on a day-to-day basis. I am a worker in a plant in a remote plant and I would love edge AI to bring my PPE compliance, any safety hazard potentially that I may run into or monitor my fatigue and tell me, hey, go grab a coffee, get a break before you start working again. So, those are some of the real world, I would say, benefits that will all be enabled with the choices to bring edge computing and edge AI infrastructure-based outcomes to life and that's why I am super excited about the possibilities here ahead of us.

**Gary Arora:**

That really makes it real for everyday people. Thank you so much, Pierluca and Rahul for sharing your insights and experiences. All right, that's it for today's episode. Thank you so much for tuning in. If you like the episode, be sure to leave us a review so we can continue to bring you more lived insights from the trenches. Thanks for listening to the On-Cloud Podcast, until next time I am Gary Arora.

**Operator:**

This podcast is produced by Deloitte. The views and opinions expressed by podcast speakers and guests are solely their own and do not reflect the opinions of Deloitte. This podcast provides general information only and is not intended to constitute advice or services of any kind. For additional information about Deloitte, go to [Deloitte.com/about](https://www.deloitte.com/about).

This publication contains general information only and Deloitte is not, by means of this publication, rendering accounting, business, financial, investment, legal, tax, or other professional advice or services. This publication is not a substitute for such professional advice or services, nor should it be used as a basis for any decision or action that may affect your business. Before making any decision or taking any action that may affect your business, you should consult a qualified professional advisor.

Deloitte shall not be responsible for any loss sustained by any person who relies on this publication.

Visit the On Cloud library  
[www.deloitte.com/us/cloud-podcast](https://www.deloitte.com/us/cloud-podcast)

About Deloitte

As used in this podcast, "Deloitte" means Deloitte Consulting LLP, a subsidiary of Deloitte LLP. Please see [www.deloitte.com/us/about](https://www.deloitte.com/us/about) for a detailed description of our legal structure. Certain services may not be available to attest clients under the rules and regulations of public accounting. Please see [www.deloitte.com/about](https://www.deloitte.com/about) to learn more about our global network of member firms. Copyright © 2024 Deloitte Development LLC. All rights reserved.