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The Deloitte On Cloud Podcast

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Title:	**Geisinger Health System: What a successful cloud journey looks like**
Description:	Geisinger Health System started their cloud journey with two goals: increasing agility and optimizing costs. They've succeeded—90% of their apps are in cloud. In this episode, David Linthicum talks with Geisinger's Interim Chief Technology Officer Dan Bennett about their success and future plans. For Dan, that success is due to investing in their people to build cloud skills and to becoming a cloud-first, cloud native organization. Their future lies in cloud-based analytics and infrastructure-as-a-service.
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David Linthicum:
Welcome back to the On Cloud podcast. Today on the show, I'm joined by Dan Bennett, interim chief technology officer at Geisinger. How are you doing, Dan?

Dan Bennett:
Great. How are you?

David Linthicum:
Awesome. And it's great to talk to you today. I'm really impressed with some of the work you guys have been doing. I've been doing some research on it. I'm an architect by trade. Anybody who's successful with this stuff and is doing the right things in terms of migrating to the cloud, we want to talk to them. Glad to have you on the podcast. So, tell us the Dan Bennett story. How'd you get to Geisinger and where'd you come from, what have you been focusing on?

Dan Bennett:
Yeah, so I originally started my career out in higher education, and after about seven or eight years, I came over to Geisinger in their information security office, and took on a couple things within that organization. And then I moved over to lead the enterprise architecture group on the IT side of things at Geisinger and did that for a little while, and then started to take on more of a technology strategy role and other things working a lot with our innovations department and eventually found my way to where I'm at right now as the interim CTO.

David Linthicum:
Yeah, I had the same kind of background. I kind of came from—well, I was an adjunct for a long period of time but was in higher education and just kind of involved in that. Even considered that as a career choice but went over to the CTO path as well and been doing that ever since, a long time ago back in the '80s. So, while we know about Geisinger, you know about Geisinger, give us the Geisinger story. What is the company? How does it exist? What does it do?

Dan Bennett:
So, Geisinger Health System is roughly a $7 billion Pennsylvania-based integrated delivery network. That really means at the end of the day that we provide healthcare services across administration, payer, and providers to really incentivize an entire and holistic patient experience. Our organization really sits within four major pillars of healthcare. We are—provide patient care. We also have a health plan. We do research, and we also own a medical school and a nursing school. We're thirteen hospitals and about 261 clinics with about 3,200 employed providers and just north of 550,000 members of our health plan. And we own two research centers with over 1,000 active research projects. And like I mentioned, we have a school of medicine with roughly 520 or so MD and MBS students. We house about 2,300 nursing students, and we see north of 600 physician residents and fellows.

David Linthicum:
Wow. That's a big concern. So, getting into the cloud journey unto itself, what was the cloud journey? How many applications were you dealing with, how many servers, dealing with different physical data centers? What was the objective? In other words, there's always kind of a big meta-strategy behind it in terms of what the board of directors wants you to do and the investors want you to do and then how you implement on the backend systems. Tell me about the journey here.

Dan Bennett:
That's a good question. So, we are, like many organizations, we are heavily virtualized. Part of our journey here started because the organization as a whole is undertaking many transformations. So, one of the natural progressions for IT was for us to take a look at our landscape and our technologies and how we deliver applications and services to the organization. So, at the time of starting, we had roughly 1,500 applications if not a little bit more, north of 7,000 servers between physical and virtual. We also happened to own and operate roughly three data centers, and I say roughly because two of them are what you would consider major data centers for us, and then a third is more of an ancillary site used for disaster recovery and other things such as that. So, one of our big goals here was to look at the data center footprint, look at where we could find some consolidation, look at really do we want to be in the data center business or do we want to be in the application and service delivery business.

So, looking into that, the organization kicked off an RFP, and we went to major cloud suppliers and hypervisors there and did a really in-depth analysis of who would be the right provider for us moving forward. We were looking at trying to get to the point where we can leverage more cloud native services where you might traditionally have many different vendor players out there within your own data center. We were also looking at trying to move to more cloud first model. Our organization has focused over the last couple years a lot on software as a service as that naturally reduces a lot of the IT burden, but also looking for places where we can land our application development, land our data and analytics and other things that might be a little more agile and versatile than having to build it within our own data center and spend the capital required for that.

David Linthicum:
One of the things I love about your journey is that you did the homework up front. In other words, you understood the business capabilities, mapping applications for what they need to be in the future, the ability to look at governance, the ability to look at leading edge security constraints, cloud first operating models, all these sorts of things that I think people skip when they're moving into the cloud. So, what was it like—was that kind of a tough thing to present in the culture of the organization but very accepted because you guys typically do robust planning?

Dan Bennett:
Yeah, so, I would say when we were looking at what our forecasted spend was likely going to be with a major cloud migration such as ours, the due diligence and everything just came naturally with it. Again, when you're looking to outlay that many dollars, you want to make sure that you're spending it wisely, being efficient in what you're doing, and we did spend months and months going through an RFP process. We started off without making any assumptions whether it was going to be single cloud or multi-cloud.

We were open to all those different options at the kickoff of the project. But ultimately, we did many of the customer reference calls, we met with the servicing organizations of each of the clouds and went through the financial exercises of all of them, and ultimately selected Amazon as our primary and single cloud. Obviously, like many organizations, when you're using things like Office 365 and others, you've got a little sprinkle of stuff in other clouds, but for all intents and purposes, our primary focus is within Amazon.

David Linthicum:
Yeah, that makes sense. Your infrastructure is basically things that are in a data center, and if you're moving to an infrastructure as a service provider, that's what they provide, so that's not unusual other than that. So, what was the expected results versus the results you achieved? I look at the quantitative impact that you guys have had, it was fairly impressive. Did you have those expectations going into the migration or was it just something that just happened, and you were pleasantly pleased or you expected those kind of great results?

Dan Bennett:
So, the original goal there was at least two overall drivers for this transformation, and the number one was for us to become more agile than what we were prior. We've spent a lot of time and resource automating, virtualizing a lot of things within our data centers, but the cloud naturally brings on even more ability for automation, brings in more ability for efficiency, and also being able to be more nimble as the business makes its moves throughout the course of the future. So, that was number one for us is unlocking the abilities that the cloud has that becomes a much larger lift when you're doing your own on-prem data centers.

The other part was looking at the cost savings play for all of this. So, part of this was not just the cloud journey itself, but it was also getting to the point where our application portfolio was right sized for the organization as well. We didn't want to just lift and shift everything we had, so we went through a very long exercise of reviewing applications and removing duplicates, looking at applications that may no longer be needed, ones that could be decommissioned because of lack of use.

Application consolidation was a big one where we've got some major enterprise platforms that run many healthcare organizations and insurance plans, and those vendors have created additional modules and other things, so we've been able to decommission bolt-ons and third-party applications in favor of expanding core applications. So, moving to the cloud by itself without the application rationalization aspect of it would not have worked from a financial perspective. You can't do one without the other, especially when you're traditionally running out of your own data centers.

So, with that said, we looked at, from a cloud play and a self-funding model, besides the application rationalization piece, we really want to, as we complete our journey and move further, getting into the point of where we're doing optimization, so starting to measure these systems that may have run within the data center that are now running on cloud and how do we measure performance better? How do we determine whether it's right-sized from a virtual hardware that we could do on-prem to a certain capacity, but we're maturing that within the cloud space. One of the other big things that we're looking to take advantage of, and the results are not in yet, but we're looking at the ability to do the scaling on demand.

So, when you're thinking about application virtualization and the presentation layer of how end points are interacting with the applications, we're hoping to be able to scale those environments up and down based on usage versus today those environments stay on all the time in the data center, whether we've got a full-time user base like we do during what I would say normal business hours versus a much smaller user base after hours, within the data center, the stuff's still running. In the cloud, we're hoping to again take advantage of some of those abilities to scale up, scale down.

We're also using the cloud as an opportunity to even take a step back from a cyber perspective. We viewed our new environment as a green field and designed the security, the network services, all of those things from the ground up free of the constraints of our current data centers. So, that was a very interesting thing as you mentioned you have an architectural background. It's interesting when you can start with a blank sheet and basically innovate and design for the future without the constraints of the past.

David Linthicum:
Yeah, that's so important, and one of the things I love about your journey is you're going for the optimization. In other words, you're not necessarily trying to lift and shift. I think a lot of companies did this during the pandemic. They just kind of pushed everything that was on-premise into the cloud as quickly as they could because they kind of viewed that as a safe harbor, better and also cheaper than operating the stuff, and not necessarily did the planning behind doing it and looking to see if that platform that they're moving forward was directly optimized to handle the applications and handle the data, and I think a lot of mistakes were made. And just the fact that you went through the due diligence, and also, I love the fact that you had a blank sheet.

So, in other words, instead of just taking an existing security system and moving it into the cloud, and when you certainly do that there's always an analog of the way in which we do security on-premise in the cloud, but looking at kind of as a green field opportunity to improving and optimizing. So, some of those stats coming for you, great. You condensed the application portfolio from 1,500 to 1,100. That's outstanding. Reduce on-premise footprint by 40 percent. Cloud adoption from roughly 10 percent to 90 percent, and then optimized staffing by 12 percent. So, this was a win-win. So, this obviously was a pretty significant shift in the way in which you're doing computing. Was there any cultural and skills challenges internal to the organization?

Dan Bennett:
Yes, that's a good question. Part of what I would say the largest aspect of the project was the cultural shift as well as ensuring that our folks within IT were ready from a skilling perspective and education because we have a lot of very smart people, a lot of very good engineers and application owners within our organization, but as you said, if you just lift and shift and move from there, a lot of the on-prem activities need to be adopted and adapted and changed from where they are.

So, we spent a lot of time and budgeted for a lot of training for our infrastructure and our application folks. We even provided training to upper level management on fundamentals of the cloud and other things there, so for leaders that wanted to understand a little bit more about Amazon and cloud computing and everything else there, we made a very significant investment early in the project, and it's ongoing, where we want to make sure that our folks have the best training and the best skills to be successful here and really kind of grow the workforce of the future for Geisinger internally because they're all heavily invested. They are, again, very hard workers and very skilled, so we wanted to make sure we were able to keep pace.

David Linthicum:

So, if you were able to go back in time and talk to yourself before you entered into this cloud journey, what would you tell yourself, some things you would have done differently or just kind of expecting challenges that were greater challenges than you expected or even pleasant surprises, things that you thought were going to be tough but ended up not being as tough?

Dan Bennett:
Yeah, I think for anybody starting on this journey, and I think we recognized this very early on in ours, but talking to peers and others, the topic we just hit around culture and your people and the education. For me, no cloud journey or transformation as large as what we're doing should ever discount that aspect. The technology piece people can learn. People can adapt, and they'll grow from there. But without giving them the proper tools and the education and the opportunity to learn those at the beginning, I think, becomes short-sighted for organizations that take the human and the cultural piece and slide it further down the project and focus more on the technology first.

So, for me, that's definitely something—again, I think we did that early on. Could we have done it a little bit sooner? Maybe. But that is number one advice for all of this, for this kind of large transformation is make sure that the people understand why you're doing it, they're behind why you're doing it, and you're ultimately investing in your own folks and really their jobs of the future because their skills are going to change, and their jobs are going to change. And again, with good people, you want to retain those, and the way you do that is by investing in them.

I was going to say the other thing that I think we learned along the way a little bit was around the application analysis. So, as you can imagine when you're going through all of these applications, they need to be reviewed one at a time, thinking about disaster recovery, thinking about the requirements for the virtual servers, things there, thinking about the security requirements, the privacy ones. As we continued down this journey, we were finding ourselves needing to adapt the questionnaire for each app, almost with each iteration. So, what would be nice to have if I had a crystal ball would have the application checklist I have now at the beginning. Because we had one, but that has adapted quite a bit as the assessments and the months went on, and I think it became a lot better, provided a lot more information for our engineers that at the early stages our applications and our engineers kind of had to go back and revisit things a little bit more than expected.

David Linthicum:
So, let's look forward where the technology's going. So, what's on your radar screen right now as the chief technology officer there? In other words, what technologies are you looking to explore to kind of take the game to the next level?

Dan Bennett:
Yeah, so we have a very healthy footprint for data and analytics, and we've been in a lot of discussions about what the future of that looks like within Geisinger and the design of that, so moving more of that out to the cloud and taking advantage of a lot of the services out there is a lot of ongoing discussions. Our research area, as you can imagine, uses a lot of data for research, and moving those platforms and those things out there as well. And really, at the end of the day, healthcare as a whole has a lot of opportunity for application modernization. And what I mean by that is a lot of the applications that we run are very traditional in nature versus keeping an eye on cloud native services like Kubernetes and other containerization options and database-as-a-service.

A lot of those things are on our radar, and we're pushing a lot of our key vendors to start looking at building their solutions or building hybrid solutions where they're starting to mix in infrastructure-as-a-service with the cloud native services because ultimately that's the holy grail. Infrastructure-as-a-service by itself without optimization, without on-demand compute, things like that is not really a big play within the cloud space. At the end of the day, it's adding those other things but the next iteration and what we're really looking forward to, and it's really a paradigm shift for healthcare vendors and healthcare applications, is getting to the point where they're using more cloud native services, which is really where the efficiency and the overall cost savings and others can really start hammering down for organizations like ours.

David Linthicum:
So, are you doing the same kind of due diligence in terms of your current state where you're looking to take it and also you guys did a tremendous job on the quantitative and qualitative analysis in terms of what the soft benefits are and the hard benefits are, things that are going to translate into direct money savings, like I just mentioned reducing applications, everything that you did, and then also the agility benefits, the ability to speed time to market. So, moving forward, how does that factor into your understanding where the technology is going and what technologies you want to employ such as cloud native that you just mentioned?

Dan Bennett:
Yeah, so again we do application development as well. So, I see a lot—a big play for us in that space for our in-house develop and our innovations department as well, but we're also looking at, as applications mature, not only Amazon and cloud native but also building that network between our software-as-a-service and other things there because moving beyond just infrastructure and platform, software-as-a-service provides many efficiencies beyond just the hyperscalers and others there. So, really looking at how we kind of thread that needle and build those highways between these different services and taking advantage of the networking capabilities and things like co-los that we didn't have before this journey I think has really opened up the possibilities in many of our traditional spaces.

David Linthicum:
Yeah, I think ultimately co-los, managed service providers, all these sorts of things that typically weren't on the radar screens of people who run traditional data centers are viable options now. You've got to remember that everything's not going to be viable to move to cloud. I'm saying this generally, not talking about your company specifically. So, we kind of have to do a triage, which looks like you did, as to where the platforms are going to—what platforms are going to be the best host to optimize for the applications and the data sets that you're moving onto, and I think that's the thing. It's kind of what struck me in kind of understanding your journey and very impressed by this, is that you put that due diligence into the system.

You came up with the architectural optimization as the objectives that you're looking for, so it wasn't too—something that will probably end up with erroneous and under-optimized solutions, it wasn't chasing a particular technology, it wasn't chasing the hype, things like that. It was looking pragmatically at what we're doing and how we're going to move these things into cloud and do so in the state where we're not going to be 100 percent optimized. We're getting as close as we can, and we keep iterating to get that better and better and better. Is that a good way to describe your journey?

Dan Bennett:
Yeah, really, really well there because I think you hit a key point. Some things just won't work out there, so—and credit to the staff here. We flagged applications early on as being this probably isn't going to work. It's not going to work well, it's got these little nuances and everything else. And credit to many of them, we still tried them. And if it wasn't successful, we brought them back on-prem, but we pushed the boundaries of some of these very traditional applications to just see if they would simply run and deliver appropriately to our customers back in the clinical enterprise and the health plan, and some of them just did not work no matter how you optimized or how many resources you put at it, and organizationally we knew there were going to be some like this.

So, it wasn't cloud everything. It was "put everything that we can out there that makes sense and can work properly," and like you said, then once we get everything out there, really try to start optimizing based on the metrics and the key information that comes out of those monitoring tools. But one of the other things with this is unless you are a 100 percent cloud native development type organization, you're going to find things that just aren't going to work, and your organization is going to have to be okay with that at the end of the day, especially when you've got legacy applications and other things a lot like healthcare does.

David Linthicum:
That's the key to success is not being afraid to fail and try new things and learn as you fail and learn as you succeed. I think people are kind of unwilling to do that sometimes, and that needs to be on our radar screen as technology professionals. In many instances in moving to cloud, we're breaking new ground. In other words, we're doing things that nobody else has done in this particular application, this particular scenario, and this particular platform, and we're going to learn as you go. And to your point, you kind of have to accept that everything's not going to be able to move to the cloud and we need to find some sort of a way that's going to be best optimized for that application then bring more value back to the business, which is what it's all about. So, where can our listeners find out more about you on the web?

Dan Bennett:
I am on LinkedIn, so that would probably be the best place to find out any of my professional information, and then they could always reach out through that as well.

David Linthicum:
Yeah, and thank you very much. The listeners really appreciate this. The fact of the matter is that people are doing this and successful with it and also sharing how they were successful, at least some bits and tidbits and insights in making it happen and kind of understanding the amount of work, the amount of concentration, the amount of talent it takes to get these things right as we start iterating through this stuff and learning more about how we leverage cloud computing that it should be as a force multiplier for the business.

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