*The Machinekind podcast is brought to you by GAI, NVIDIA, and Dell Technologies, and produced by Government Executive Media Group’s Studio 2G. Artificial intelligence is showing up everywhere – from our daily commute to shopping online to watching television. Federal agencies see the benefits of AI to their constituents, too, but haven’t yet fully realized its potential.*

*Getting started on implementing an AI solution can seem daunting.*

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**Connie:** In 1956 a group of scientists gathered at Dartmouth university in Hanover, New Hampshire to work on a summer research project. It wasn't top secret by any means, but it did draw some of the brightest minds in research and technology at the time. Dartmouth math professor John McCarthy organize the project and invited scientists from companies like bell telephone laboratories and IBM, which had just rolled out the first commercially available scientific computer, the IBM seven Oh one just a few years before it weighed 20,000 pounds. This project was related to the new field of what was then called automatic computers, but the scientists who gathered at Dartmouth that summer, were chasing something bigger. You might say. They were studying the art of the possible how to make machines, use language, solve problems, and even improve themselves. In short, how to be more human. We think that a significant advances can be made in one or more of these problems. If a carefully selected group of scientists work on it together for a summer. The researchers wrote in their proposal and it's just what they did, commandeering the third floor of the Dartmouth math department for the next two months. In the end, we know that a big breakthrough alluded them, but the project marked the birth of a movement created a new concept and coined a new phrase as it turned out, John McCarthy summer research project was the first study on artificial intelligence.

**[intro music]**

**Connie:** Welcome to MachineKind a new podcast from Government Executive in collaboration with Nvidia, Dell and GAI, exploring the art of the possible in artificial intelligence. I'm your host Constance Sayers, president of the Government Executive Media Group and we're recording this live from our studios here at the Watergate in Washington D.C. My guests today are Jay Lambke, president of GAI, who's technology career dates back to the late 1980s and Dr. Alexander Kott, chief scientist at the Army Research Lab. Artificial intelligence seems like a new thing, but it's actually been around longer than you might think. In this episode, we're going to tell you more about the evolution of AI research and where things stand today, especially in the public sector. Dr. Kott knows a bit about the early days of AI. He was researching AI approaches to invention of complex systems in 1987 when he was working on his PhD in mechanical engineering at the University of Pittsburgh. Dr Kott, welcome to the podcast. It's my pleasure having you today. We'll start with you.

**Dr Kott:** Thank you, Connie.

**Connie:** So take us back to 1987 what was the state of artificial intelligence like then?

**Dr Kott:** You know, Connie by 1987 AI had already gone through at least one major wave of hype and that was back in 1960 followed by a wave of disillusionment and funding cuts in 1970s but then by late 1970s the AI excitement has bubbled up again after showing some practical successes in solving problems like product configuration and medical diagnostics. Important. In early 1980s four smallish but well-publicized companies emerged and they specialized in AI. They were called the gang of four and usually was started by professors at the major universities. This were companies like IntelliCorp, Inference Technology, and Carnegie Group. I got bitten by the AI bug around 1983. I was a mechanical engineer at the time and I wanted to automate some of the recurring because engineering tasks like design of products. So I did my PhD research. I started probably in 1984-1985 on how AI can invent novel thermal cycles, things like engines, turbines and so on, and that actually worked.

**Dr Kott:** So by 1987 I needed a part time job while finishing my PhD and I joined, a very prestigious at the time, company called Carnegie Group in Pittsburgh. It was started by several Carnegie Mellon university professors in 1983 few years before I joined them. When I came there they said, you see how many of our guys have ponytails and earrings? That's AI. Carnegie Group had big industrial investors like Ford, Boeing, DEC, US West, and we did a lot of custom applications for those co-owners of the company. I remember doing some AI based design automation for Ford car components. Then I came up with a generalized software which was based on AI planning techniques for configuring custom electromechanical products. I worked with a major manufacturer of custom electric motors and we automated the process of preparing preliminary designs for hundreds of requests for quotes that they were receiving every week. My colleagues also worked on other large projects like generalized software for developing automated maintenance diagnostic applications. They were called expert systems at the time and also for mechanical translation of maintenance manuals into multiple languages. There was all kinds of interesting stuff.

**Connie:** And this is all done at a, when you were...

**Dr Kott:** It was all done while I was working at the Carnegie Group in Pittsburgh, Pennsylvania.

**Connie:** And so, you know, just pivoting a bit to, you know, government and you know, kind of the history there because it used to be that really only only, you know, government agencies and other places could really afford to have some of the big computers. I mean the cost of running a computer I think was $200,000 per month at one point. So you know, the people that could actually afford to be doing some of this, we're probably limited to certain places at the time.

**Dr Kott:** You know, actually, uh, computers in their prices were changing very rapidly at the time. So this was a, those were dramatic times when people were suddenly realizing they can actually afford a computer and they can actually afford a lot of computing time. So this was all changing very rapidly and there was a wide diversity of possibilities. So yes, government certainly was very interested in what we were doing. And uh, in particular regard a lot attention from the various branches of the military. I remember working on a very large system for the United States transportation command. These are people who are flying and moving everything around for the military. And we worked on a particularly challenging problem called air medical evacuation and that's a very complex problem, was many complex constraints. Uh, you got to have the right planes at the right places at the right time.

**Dr Kott:** You have to combine multiple patients because you can't send one large plane for one patient, not, not usually have the right flight nurses with the right credentials and equipment available to match that plane because not every plane can take every kind of equipment or every kind of a patient depending on the condition. And the law depends on how urgent the deliver the patient is to the facility and so on. It's a very complex problem. Uh, and the, the transportation command did not do very well, was that in during the first, uh, Iraq war, they were sending patients to wrong hospitals, uh, took very long time. So Congress got involved, Congress got upset about it in 1993, the United States transportation command got orders from Congress saying, Hey, fix this. They said, it's got to be AI. What else can possibly do that? And um, and so they came to us and we did it and other exciting projects, which I think still has a significant relevance.

**Dr Kott:** A was a prototype expert system for the army CERDEC, Communications, Electronics, Research, Development, Engineering Center. And uh, that system performed semiautomated battle planning. When army brigade sized combat operations synchronize called the actions and movements and fires and resupply and intelligence collections taking into account constraints of enemy counteractions, and terrain constraints, timing how, how fast can you move, how fast can you overcome enemy resistance, available resources and so on. And we've got to the point that in most cases it did as well as human planning officers. And of course, much much faster. And this is just a couple of examples of what we have done. Um, at that time, this was late eighties, early nineties.

**Connie:** And that's how long you've been kind of on the public sector side after you left the Carnegie group, kind of?

**Dr Kott:** You know, I left the Carnegie group only in early two thousands, I went to DARPA and because I've been doing a lot for research for DARPA at the time and DARPA played huge role in funding AI research and trying to push it along a, sometimes they would stop funding it and that very often crane site, it was so-called AI winters. In other words, periods when AI was no longer popular and companies like Carnegie group for which I worked, started to 12 void the word AI. They were talking about, you know, intelligent computing can, they will talking about computational intelligence and they were talking about advanced computing and this and that. AI became a dirty word for awhile. So it's interesting how it all came back.

**Connie:** And it seemed like it was definitely more project based than it was a, we're going to try this right or that it wasn't really like a sustained type of investment for anyone. That's kind of what you're saying.

**Dr Kott:** So to a large extent, we try to reuse the same methods and all some of the underlying software. But this, we're a custom systems, custom applications for a variety of customers who had different needs. So a large fraction of the methods and techniques had to be reinvented every time.

**Connie:** And Jay, I'll just, you know, turn to you. You've been in the tech space. So since the late 1980s, um, we're in the, you know, government industry and you've certainly worked with federal, state, local education. What levels and where have you seen the most invention in, in innovation and how AI is used?

**Jay Lambke:** Well, that's a, that's a big question. There's so much happening right now, um, that the pace of innovation that we're seeing right now in AI is unlike that which we've seen, um, at any point in time that I can remember. In fact, um, I think if you project out, there's not an area in the next 20 or 30 years of our personal professional lives that AI will not have impacted. I love the term, um, AI winter. I had not heard that before, but, uh, it appears that we're at least in an AI spring, uh, at, at a minimum. And so there's a lot of innovation that's happening. And um, so specific in the federal, uh, space, what we're seeing is where you would expect where AI is really good is at, uh, sifting through massive amounts of complex data and understanding trends or anomalies and that type of stuff.

**Jay Lambke:** So really be enabled to classify and sense certain things and in large amounts of data. And so that's where we're seeing the benefits and then how that manifests in actual kind of agency benefit and where we're seeing a lot of the federal activity now, uh, for one in the healthcare space, um, a lot happening in healthcare. And that's an area where I think, um, in DOD healthcare and federal healthcare, uh, not to mention the commercial space where AI can have potential profound impact on how we identify diseases and deliver medicine and so forth. Um, intelligent video analytics, we're seeing a bunch of activity around there and potential outcomes from that. Workforce automation, uh, is an area, this whole notion of, of taking both mundane and complex, um, tasks and being able to automate those are seeing huge activity and potential gains around a fraud, waste and abuse.

**Jay Lambke:** So if you look at how much, uh, just Medicare, Medicaid and IRS lose every year through fraud, waste and abuse, the potential impact to help solve that problem is, is just profound. And so we're seeing a lot of potential, a lot of activity and potential benefits coming from fraud, waste and abuse, cyber threat detection and remediation. Um, you know, detecting cyber threats is really kind of a tailor made problem. AI, it's, um, if you look at what happened with target when they had their breach, one of the things that they said was we had the data that told us what the problem was. We just couldn't find the data in amongst all the other data we had. And so the ability to detect what matters rapidly and zero in on that is, is, um, offers an opportunity for really big impact, um, autonomous sensors. And then this, um, whole thing that dr Kott referred to in one of, uh, one of his comments around what we now call platform sustainment, predictive maintenance, um, on airplanes, ships, tanks, you name it, uh, automobiles, the ability to have to position the right parts in the right place at the right time to make sure that the platforms stay operational the majority of the time.

**Jay Lambke:** And then so, so one of the things I mentioned was workforce automation. I'll go, I'll go back to that. One of the early impacts and on-ramps we see are, I call it kind of training wheels for AI, um, that we're seeing a lot of activity around is, um, robotic process automation or what's called RPA. And so that's this notion of having a software robot that performs fairly mundane tasks, right often does them very effectively. And like with everything else with AI, the machine does it take a break, it doesn't commit the errors that a human being makes and so forth. And so we're seeing a lot of activity in the RPA space and using that as an on ramp for the customer to really understand kind of how that can impact their ultimate AI activities.

**Connie:** Those were some great examples and I mean, Dr Kott, I think I'm, I'll turn back to you for a second. Um, most federal agencies have really just started dipping their toes into the AI water and Jay just, uh, highly automated tasks and streamline processes. The army research lab where you work as much further than that, it's developing a synthetic partner that would help soldiers do their jobs better. So tell us a little bit about the story behind behind that. That's a very interesting story.

**Dr Kott:** The work at army research laboratory, um, where I am, the chief scientist is very diverse. We cover a lot of ground, uh, among all the, at work among this very diverse portfolio, there are some like particularly important in large programs, which we call essential research programs. And one of them is called artificial intelligence for maneuver and mobility. And what we are trying to accomplish in that program is to build AI enabled systems for autonomous maneuver on the battlefield. Systems that can rapidly learn, adapt or reason and act in multi-domain operations. Multi domain meaning air ground cyber. Very importantly as Jay mentioned, cyber is a problem that is tailor made for AI in fact certainly not tailor made for humans. So the question that we are trying to address in our research and in developing some potentially practical system was can we deliver a resilient autonomous off a road?

**Dr Kott:** The navigation not on road like self driving cars which operate in a very structured environment or roads that signs markings on the roads. There are other cars, no, can you do it off road in the very difficult, very chaotic environment of the battlefield was all kinds of features that are around you and none of them are very irregular or structured and it test to be done at a serious operational speed. You can just slowly curl through us through the battlefield terrain. You have to move fast because there's an enemy out there. And if you are slow, they will take care of you. That atonomous system also has to have a recognition of trying to save itself from the enemy or position itself into the position of advantage. In other words, the easiest or out very often is not the best route. It may be the worst route to take if the enemies watching it.

**Dr Kott:** And, uh, so can we enable those systems to understand the scene? What's, what's in front of them, what does it mean? And the put together all kinds of sources of information, not just the visual but audio ulcer, perhaps overhead imagery, also radar imagery and so on and so on, and put it all together and interpret it in a way that will help it to move autonomously. Of course, all this has to be done in the conditions where, uh, we have to deal with a sophisticated enemy, which is capable of deception, capable of jamming the communications and so on and so on. So this is what we're working on. And, uh, we expect that such autonomous capabilities will become necessary. And they will become a ubiquitous part of the future battlefield. Now the problem of course as it is one thing to develop in intelligent AI and other things and develop an intelligent AI that can actually understands the human being that it helps its human teammates that is much harder.

**Dr Kott:** So we need to find ways and were developing those ways for the AI to understand what the humans teammates are trying to accomplish. And for the human teammates to be better at understanding what AI does right now. Hey, I very much is where much of black box, it just does something and it cannot explain itself. And this may be in fact an unsolvable problem because the AI doesn't think like we think and therefore it may be impossible to explain. Nevertheless, we're looking for ways to at least make it a more transparent as to, okay, why is it doing this? Why is it sank? It needs to go to the left. Why not to the right? And so this collaboration between AI and the humans is a huge challenge and we're working on it.

**Connie:** Kind of gets back to the conversation we had earlier about arguing with our GPS. A little bit about how do I become a better teammate to my GPS system. And Jay, let's talk about how you go from thinking about AI to actual execution. If you're battling a path to AI, what would it look like? I will say that, you know, as these new technologies and you know, as always come up, the first thing I always hear when we're doing events and we're doing things with Government Executive is, um, no, nobody really knows where to start. So we have all this technology, but like, what's a good first step? How do people begin?

**Jay Lambke:** Yeah. So a question we spend much of our time working with our customers on. So a great question and as you can tell from some, some of Dr Kott's comments, uh, ARL and some, and a lot of the DOD in the intelligence community are, are much farther along down the spectrum in terms of, of engaged in real programs. What we see in other parts of the federal government. Is there anywhere on a spectrum of maturity, um, with where they are in terms of engaging in AI? So one of the things that my company, GAI, does a lot of, um, relative to this is we have a series of, of um, executive AI courses that are specifically designed to help the line of business owners and the executives in each of the agencies understand kind of what is AI and then how do you go about implementing AI.

**Jay Lambke:** So how do you start to tackle this problem? And so, um, and we have a five step process that we walk them through. And I'll, I'll share that here in just a second. But, but I would first say that the one thing that we coached them heavy on is don't try to boil the ocean. Find a single solution that you think AI can solve that has major impact on the mission and surround that particular thing. Don't try to do too many things initially, just pick one and go. And so, so the first thing is, is really identify the problem, right? So it's identify a specific area of challenge with delivering your mission that you believe AI can solve. And, and start on there. There's right surround your efforts around that. Next is get the endorsement. So, um, it's critical. I can't underscore this enough that you define a clear ownership structure and you have buy in at all levels in the organization because these projects kind of ebb and flow.

**Jay Lambke:** Um, the results are sometimes, um, not immediately known. And so it's critical to keep the funding and the, and the ownership in place. And you do that by making sure that there's engagement and ownership all the way up and down the leadership chain. Uh, number three is access to the capabilities. So in order to do that, we, we coach our customers through doing an assessment internally of the skillsets and the capability that you have internally versus what you're going to need to go external for. And given the relatively early, um, state of where AI is in the federal government in terms of practical application, much of that knowledge that our customers are gonna need is not contained in them. It's, they're going to typically have to go outside for that, that capability. And so, um, number is really look for partners, right? So partner for both capability and capacity.

**Jay Lambke:** And um, and then my coaching to customers on that is if you're going external, you're going to have to partner for that or contract for that. That's okay in the beginning, use that engagement to teach your organization and develop the in house capability as time goes on. So you don't have to keep going out for that. It's critical that our customers start to develop this capability inside the all parts of the organization because as I said earlier, AI will ultimately impact almost every part of these organizations. And so it's critical that they start to get the in house knowledge. Um, and so one of the best ways to do that is partner for it initially and then bring that in house. And then the fifth thing is, is really kind of an ongoing thing that we call create the right mindset. And so this is the whole notion of making sure that everyone who's impacted by the AI understands that this is a process, not an event, and that this is an ongoing thing that's going to require some level of change management if you will. And so creating that expectations. You know, I had an old boss who said the the formula for happiness is expectation minus reality and if, and so it's important that you set proper expectations in the organization and then can continue to communicate to that. So it's creating that mindset on an ongoing basis. I think. So we see that working.

**Connie:** What strikes me just from like for both of your stories. I mean, you Dr Kott have kind of a, a laboratory that's, I mean that you have a working laboratory that you're, you're doing this amazing outcomes from an it and you're really pushing the technology and then what you are trying to do, Jay with your, with your customers is try to, like they don't have a laboratory then they're trying to like how do they take the best of, you know, kind of what you're doing Dr Kott and then kind of put that into their own agencies because it can seem intimidating. I mean I think you know, what you're doing is amazing, Dr Kott, but it's just, I don't know that we can expect every agency and they might get intimidated by that and think like...

**Jay Lambke:** Well there's intimidation there. And then there's, as I said before, just the general lack of ability to do it right. So first I need to understand the problem and then I need to get the capability to start solving the problem. And so, yeah, it's a, um,.

**Connie:** Cause they don't have, they don't have a natural laboratory environment that you know, that you have at the army research lab or at DARPA or other places. So it is definitely, yeah.

**Jay Lambke:** And, and as ARL alert and DARPA and, and uh, DIUX and, and they know is this not only this, it requires, um, more than just a lab, as you mentioned, it requires a commitment of investment and infrastructure and people in order to sustain that effort. This can't be a, this can't be a onetime thing. Right? This is an ongoing, this is the beginning of a very long, very complex process and it requires leadership and commitment and investment.

**Dr Kott:** absolutely. A, you know, it, it takes a whole ecosphere. It takes a whole environment, of different types of players, um, uh, advanced, the research, it laboratories of practical applications, industry, actual users, putting together all these capabilities. It is, you cannot just draw the line somewhere. It is a continuous process. It is an ecosphere. We're all kind of important players contribute their own important elements within the overall system.

**Connie:** A final question for you, Dr Kott. I mean, the meeting at Dartmouth was over 60 years ago. You were tinkering the lab at the University of Pittsburgh about 30 years ago. What do you think the future of AI is 30 and 60 years from now?

**Dr Kott:** You know Connie, like Jay said, we are certainly at a kind of discontinuity point in the last few years. Things have been developing so rapidly. I do believe that although perhaps they will not be developing as rapidly as we have seen in the last several years. There will be a continued strong move towards greater capabilities in a related to world. Uh, I think where it needs to have the most profound change in the human civilization in January, including warfare, but also all kinds of other endeavors of human mankind. It's not unlike the invention of agriculture, really not unlike a domestication of the horse. We suddenly have this domestication of an alien intelligence. We suddenly have this invasion of alien, intelligent life forms in our human civilization. In a few years, we will find ourselves in the world where we are only one of the intelligence species and we will have to get used to it.

**Dr Kott:** That's a radical transformation. And such radical transformations in the past have not been particularly smooth. So we will have to see how well we can manage this transformation. So just to mention a few ramifications of this invasion of a different, uh, intelligent life into our civilization. For example, the cyber-defense and their resilience will be largely handled by artificial intelligent beings, not by humans anymore. I think the networks can know how important networks in our world currently are. I think networks kind of, we'll use a peer, they will be replaced, but kind of a society of intelligent beings, some of which will be artificial and some of which will be a nature. Well, I don't know, maybe we will not be so natural to be a carbon form of life. 30 years from now. We humans will have to learn to trust AI and to depend on AI.

**Dr Kott:** And in some ways we're already there. Uh, we use navigation apps. Some of us, like you Connie, argue with them and some of them like, I, I just accept it. It says, turn to the right. I turn to the right. I don't argue. The whole industries are emerging like Uber. They are only possible because somebody tells all this inexperienced drivers where to going, where the turn they could not exist otherwise. We're all feeling out tax forms using a variety of tax for filling programs and, uh, we're getting, getting used to it. It says, well, take this deduction. Instead of that deduction, we just push the okay button. Right? This will be a different world in which we will have to coexist with. No kidding are real teammates that, uh, AI based artificial intelligent beings.

**Connie:** Jay, I'm going to give you the last words there. How do you envision AI will evolve over the next few decades?

**Jay Lambke:** Well, I think Dr Kott said it very well. I said earlier, I think that there's not an aspect of our personal and professional lives that AI will not impact is this is, um, this is what I call the rising tide that will ultimately lift all boats. Um, caveated with, assuming we manage this properly as, as society. Um, just to give you an economic impact. Um, there's an estimation that AI will contribute $16 trillion to the economy by 2030. That's trillion, not billion. That's a profound number in terms of its economic impact. And so just to add a couple of, of more impacts on use cases and things that will happen in the next 30 years to what Dr Kott said is, um, natural language processing will become commonplace.

**Jay Lambke:** So one of the things Dr Kott referred to is a soldier interacting with AI and AI understanding and interacting with a soldier, uh, in a very complex, chaotic battlefield type situation. Um, one of the key aspects or underpinnings of that is gonna be the advancements in natural language processing. And so it'll, it'll manifest in ways like that. It'll also manifest in ways where when you call and talk to a machine, I spend way too much time talking to my airlines as much traveling as I do. And you know, you get that little automated thing that goes when you're, when you're waiting and it's terrible and you keep saying agent, agent, agent and it just keeps putting you through these loops. But in the very near future, it's going to be commonplace to interact with the system and really not be able to tell if it's a, if you're interacting with a system or a human being.

**Jay Lambke:** And, and that's very powerful. It freaks some people out, quite frankly. I think it's, um, I think it's very powerful in terms of its impact, right? And in a very positive way. Autonomous vehicles. So, um, we, we talked about Uber and navigation and so forth. I tell my children all the time, my kids are out of college and in the workforce and I tell them while they own a car, they probably won't own a car later in life. And their children will almost certainly not own a car and will never know the concept of automobile ownership because autonomous vehicles will be commonplace. There'll be highly available. You'll step out of a meeting or whatever it is and you'll summon a car and it will come pick you up. And by the way, if we do that effectively, we free up the number of parking lots in the world and covered spaces and use that asset in a very different way.

**Jay Lambke:** It's very, very powerful and has very profound impacts. So I think this whole notion of of autonomous vehicles, passenger cars, freight, um, if that occurs effectively, it allows us to come out of a two dimensional transportation system that we have today. So you've got to remember everything we do from a transportation system with exception of air travel is in a two dimensional space. And, um, so if we can be effective with autonomous vehicles and, and low flight vehicles, we can now turn, uh, roads into three dimensional spaces. And so you don't have to keep the planet right and a lot of good stuff there. Um, I said earlier in healthcare, I think the diagnosis and delivery of health care, the opportunity there and the impact stands to be just incredibly profound. I hope that's very positive cause we certainly need them some positive advancements in, in healthcare that don't end up costing the consumer so much money.

**Jay Lambke:** So I think there's opportunities there, early stuff happening there where, um, with the ability to do early detection on cancer and other anomalous type cells, uh, detect that way earlier than a, than a doctor, even the best trained professionals can. And so, so I think it'll have very profound impact. And then the last thing I would say is, and this is not a prediction of what I think will happen, this is more of a sincere hope and that sincere hope is I sincerely hope that the U.S. Federal government seizes and retains and, and hangs on to a lead in the AI space. And I can't say that enough. If you've ever read Tai Fu Lee's book called AI Superpowers and the new world order, one of the things he says in there is he who wins the AI race, wins the world. And, um, there are bad actors in nation States out there, um, investing heavily in AI today and it's not AI for good.

**Jay Lambke:** They're, um, they intend to upset the balance of power in the world and they have, they believe this technology gives them that opportunity to do that. And so it's critical that the good guys, us and others like-minded like us. When this space in time Dr Kott made a reference to societal upheavals basically on, in certain technological revolutions. This is a technological revolution that the good guys must win. And so, uh, having said that, I will tell you, I see there are some super smart people in the federal government who are committed to solving the challenges of AI and committing to creating and maintaining a lead. Um, it's exciting to see what's happening here. And so, um, I hope that we continue along this path. Um, but it's gonna take more than just smart people. It's gonna take highly committed leaders with funding that follows and the patients to see projects through and not expect an immediate impact. This is, uh, this is a many inning ball game we're playing right now.

**Connie:** and we need, and we need to have some more AI Springs, or at least.

**Jay Lambke:** Yeah, no more winters.

**Connie:** No more winters. On that, I will thank you both Dr Kott and Jay Lambke for joining me today, um, on our, on our podcast. Thank you so much for your time and, and, and great insight.

**Dr Kott:** Thank you as well Connie.

**Jay Lambke:** Yeah, thank you.

**[exit music]**

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