



## SoundBites Podcast Transcript

### Episode: Peter Korn from Amazon and Achin Bhowmik

Dave Fabry: Welcome to Starkey SoundBites. I'm your host, Dave Fabry. Starkey's chief innovation officer. Today, we're going to take a deep dive into one of my very favorite topics, as you can tell, that from my title, innovation, as chief innovation officer. We have two outstanding guests today who are both experts in technology innovation and represent the growing partnership between Starkey, a leader in hearing technology, and Amazon, a leader in software and retail technology. Dr. Achin Bhowmik is the chief technology officer and executive vice president of engineering here at Starkey, and Peter Korn is the Director of Accessibility for Amazon's Devices organization. Achin and Peter, thank you both for joining on the Starkey SoundBites podcast.

Peter Korn: It's my pleasure to join you. Thank you so much for having us.

Dave Fabry: Of course. And first things first, let's start by talking a little bit about the latest and greatest in new technology. Here at Starkey, we just launched new tech that we're very proud of, we call it the next level in Evolv AI. And Achin, I wondered if you could take a deep dive in for just a minute or two on what's the big deal about this next level of Evolv AI?

Achin Bhowmik: Yeah, it's very timely. We had over 200 audiologists, professional customers on our site today here in our headquarters. And we had the privilege to introduce to them the new product family of products, the Evolv AI had upgraded with a whole host of new technologies in there. And I'll take a minute after to explain to your audience what they are.

First and foremost, the primary function of hearing aids are to enhance sound and make the speech clearer than the noise around it. Make it easier for people to communicate with each other. So along those lines, we have a relentless drive to improve sound quality, reduce noise, enhance speech. And along those, we announced this morning that the new device is going to cut down the noise energy by an additional 40% in challenging situations where you have wind noise, when you're taking a walk outside or machine noise, like a vacuum cleaner or a truck passing by. So this is going to be a stunning boost in the user experience for the patient with 40% additional reduction in noise energy.

We also announced our flagship technology Edge Mode improvement. So now Edge Mode, which has been helping people with clarity of speech in noisy environments, with a simple double tap, it's based on our Edge AI technology. Now it's going to provide an additional speech clarity in transportation, such as car, train, planes. This is going to immediately be noticed by people who struggle to understand conversation in noisy environments.



We also have laid out a new technology and that's completely hands-free experience, when people are streaming phone calls from Apple devices into the hearing aids. Now you don't have to, you can accept the call, reject the call or end the call directly from the hearing aids.

And of course we emphasize our amazing work with team Amazon for Fire TV streaming. It's going to be received very well, particularly as we get the messages out from both sides on this new capability in there.

We continue to work on healthable technology to keep people safe and detected the fall and whole bunch of stuff. So really excited about it and see what else you want me to explain as we get along into this conversation, rather than raving about industry's best hearing aids.

Dave Fabry: Well, but thank you for that summary. I think for those people, the audiologists and dispensers that are listening they'll want to know what the latest updates are, and they can go to [starkey.com](http://starkey.com) to get more of that information. But now let's turn to the partnership that we have between Starkey and Amazon, and bring Peter into the conversation. So, first Achin talk a little bit about how long has this partnership been in place, and what is it involved before we do turn to Peter?

Achin Bhowmik: Thank you. So I'll set the context and let Peter explain. We have had a pretty deep collaboration with Amazon for many years now. When we introduced the world's first multipurpose hearing aid, the concept of extending the functionality of any devices to go beyond amplifying sound, we partnered with Amazon for our Thrive assistant technology, where simply the patients could now double tap the hearing aids and ask any question, and get the answers brought to them, the power of cloud. Right? So that first step towards turning your hearing aids into your very own information assistant, was a result of our collaboration with Amazon. And then we have been working and exploring together for quite some time now on how do we extend the partnership to have the range of consumer devices that Amazon team continues to bring to market, pretty amazing area of ever-expanding area of devices? How do we bring those devices to be helpful for our patients who are using our hearing aids? And I will let Peter explain this specific product that we have together now that brings the value of this partnership to our patients.

Dave Fabry: Excellent. And before we do that, Peter though, let's talk a little bit about your role in accessibility at Amazon. How is it that you became interested in working specifically? Because we're deeply embedded with patients who have hearing loss and communication challenges. And as Achin said, first and foremost, we're always designing devices that will provide outstanding sound quality and speech intelligibility in every listening environment that they encounter. Speech in noise is often where people with hearing loss first encounter challenges related to communication. But the second and I mean, a close second is often with regards



to their exposure with media, we've saved more than a few marriages by trying to improve the battle for the remote control on a television set between family members as if one has a hearing loss. But how did you become involved with accessibility, and then dive in a little bit on this next gen product, the Fire TV and things?

Peter Korn: Absolutely. So, I got my start 32 years ago, next February. So just after this passage of the Americans with Disabilities Act, I started at a small company making products for folks who were blind or low vision. Moved from that into large enterprise companies, Sun, Oracle, and then not quite nine years ago, next month, with Amazon. And at Amazon, I lead our Devices and Services Accessibility team, in building year after year more ways for our customers with vision loss, hearing loss, other disabilities so that they can not only use our products, but find them delightful to use. Our philosophy is we don't want to simply meet some bare minimum of accessibility. We feel that it's our job to earn the business, to be worthy of the business of our customers with disabilities. And so, we need to make things that delight them, that they come away with: "this is something that's really nice!" And to do so at consumer electronics prices, prices that are affordable - as so many people with vision loss, with hearing loss are underemployed. And all of us want our dollar to stretch further.

Dave Fabry: That's outstanding. And I didn't realize that the length of your experience with this dates back to really the origins of the Americans with Disabilities Act, we had on a previous session of the Sound Bites podcast, we had Richard Pimentel, who also was very instrumental and influential in the Americans with Disabilities Act. And it's kind of a nice, happy intersection here of the way that you have continued over 32 years. And congratulations on that commitment. And also I think another thing that a lot of people may or may not be familiar with is the strong comorbidity, particularly in the aging population between those who have both hearing loss and visual impairment and how challenging that can be when you have the combined impact of hearing and speech difficulties.

So let's move specifically first into the Fire TV and how that project came to be and why it is such a delightful experience to have those with hearing loss be able to get that crystal clear sound to their hearing instruments and enjoy media provided by Amazon.

Peter Korn: When I joined Amazon in September of 2013, there were several secret projects we were working on. One of those was Fire TV, and we really saw an opportunity as we moved even further into consumer electronics to have much broader reach than we did with a more typical tablet, computer or something like that. And so we were very eager to really lean into that and Fire TV, when we launched it in I think 2014, was a really innovative product. It was the first television streaming player that you could activate by voice, right? You picked up the remote, you pressed the mic button, on it. And then you just asked for



what you wanted, and the convenience that that offered compared to navigating through an onscreen menu to slowly type in what you wanted to search for.

And so, we then took the screen reader that we were building. We hired a fantastic engineer who was blind, who wrote our VoiceView screen reader. And we brought that to Fire TV and we brought it there alongside Alexa, who then became part of the Fire TV experience. Almost immediately after we introduced the voice search, we introduced Alexa and Echo and the ability to speak what you wanted and hear back through the screen reader, what you were getting, made for a revolutionary improvement for customers with disabilities. And then we added to that a magnifier, a dedicated feature for customers with a narrow field of view to bring all the information together to them. We brought audio descriptions to Prime Video. We now have thousands of audio-described titles that adds onto, I think over 160,000 closed captioned titles. So, we're really leaning into entertainment accessibility, because entertainment is such a key part of our lives. The three Es, right? Education, employment, and entertainment.

Dave Fabry:

Absolutely. And I can tell you, number one, in addition to the partnership, I'm a huge fan and consumer of this as somebody that has had lifelong, both front of the eyeball and back of the eyeball issues. As soon as the voice command for Fire TV became available, I was using it. We unplugged from cable, and nothing against cable users, but some number of years ago, the one thing that cable TV I think has done and continues to do so well is they have a one interface for the UI across all of the different apps. And that's one thing that is complicated when you're having to navigate using the screen and the remote controls, but using the voice is a natural user interface. And then specifically with the Fire TV, as somebody that did and does wear the devices and stream to them, I can tell you that it indeed was a delightful experience to be able to talk on the input side and then to be able to amplify appropriately for a person's hearing configuration effortlessly, if you will, and streamed directly to our hearing instrument.

So I think I would echo everything you said, and Achin, I don't know if you have additional comments, but that combination of vision and hearing, the natural user interface without having to go and see, or hear with your hands, to be able to see with your eyes or use your mouth as a natural interface in language. And then to be able to process directly in the ears is really a game changing experience.

Achin Bhowmik:

I'll add my bit to the human computer interface, Peter, and you're talking about. Suddenly this is the feature. It's one that you don't have to explain the way that we talk to each other is via voice and just talk to each other. So this move from the traditional ways of having to press buttons and type out words of the long words, describing a movie title, it can be done, but nothing is more natural than



simply picking up the technology and talking to it. This is going to just change how humans enjoy technology and interfaces with them, and the work that the team at Amazon are doing on AI technology, that's making it possible is quite astonishing. Suddenly it's benefiting our patients, as well through our collaboration, our products, right?

Dave Fabry:

Yeah. And my in-laws, I mean, the reality of the situation, like vision, hearing losses can strike at any point in life. It goes a cradle to grave issue, but the reality is at least in our space, the older you are, the more likely you are to have a hearing loss, even if you haven't previously. And so, you don't have to be a rocket scientist or technophile in order to use the voice, as Achin said, it's embedding very sophisticated technology underneath the surface in a very easy human machine interface. And my in-laws taught me how to use the voice interface on Fire. And then in turn, I was able to help them stream directly to their hearing aids so that they could watch on their app-based TV as well. So kudos to that. What do you see as the horizons that we can talk about in terms of continuing this focus on accessibility for those with vision and or hearing impairments, and why partner with a hearing healthcare company, from Amazon side?

Peter Korn:

Well, so when we think about it, over a billion people on the planet have disabilities and specifically looking at hearing impairment, some 460 million worldwide have disabling hearing loss, and hearing aids are generally the best way for these folks to address that loss. And so when we thought about the footprint of our devices, we've sold over 150 million Fire TV devices. And the importance of this customer group, it was just natural to reach out to Starkey and look to deepen our existing partnership and go in this way.

And I really can't thank Starkey and the engineering team who I had the pleasure of working with enough. They spent months with us tracking down issues that were impacting range. Bluetooth low energy, it's low energy for a reason. It doesn't go that far. It's not designed to go that far. And then audio on top of low energy, which was, again, not part of the original design of low energy, adds additional challenges.

And so it took a lot of hard work and work with our chip vendor to fix issues, issues on our end, issues all around, to where we could stream from six feet away while the TV is at the wall and you're on the couch or you're in bed.

And one of the other things that we did is we married Alexa and the Echo product line with Fire TV, in the Fire TV Cube. So with Fire TV Cube, you don't even need to hold the microphone near your mouth to talk to your TV. You just say, "Alexa, find princess movies." "Alexa, watch this show on Netflix." "Alexa do this or that." And the work we did with Starkey and implement this interface is deep into the low-level Fire TV platform. So everything you listen to through Fire TV comes through your hearing aids, whether it's a movie or TV show from



Prime Video, Netflix, Hulu, Apple, Amazon Music, even talking to Alexa, can be all through your hearing aids. So it just lifts the entire audio experience and delivers it to Starkey hearing aids.

Dave Fabry:

Yeah. I mean, it truly as somebody that uses this on a daily basis, I can tell you that it has been meeting your expectation for delight, as you say. And when we think about it was really only now eight years ago that the first devices that were directly connecting hearing instruments to smartphones were possible through those early days. And really the use, as you said, Bluetooth low energy is the platform we're using because our customers need all day battery life and they need that convenience. So that now when we have rechargeable batteries that they last all their waking hours, whether they're streaming and or combining that with environmental use. So that platform really facilitates a democratization of the use of accessories.

In the old days, we had to have intermediary devices, it was hard to pair, and the entire pairing process as well for people. If there are end users listening, wondering whether it's hard to set up, talk a little bit about that, and Achin, maybe pipe in too. If from the standpoint of the design, we needed to make this as the user interface. It's always, we want it to be as simple, but as elegant as possible.

Peter Korn:

So that was one of the things that we really paid a lot of attention to, and on the user connection, in our relationship with Starkey, Starkey staff and early alpha testers gave us a lot of great feedback on the importance of the ease of use in the pairing process, the ease of use in disconnecting, so that you can reconnect it to your phone and take a phone call that comes in while you're watching a show. Disconnecting from the phone and then reconnecting with the Fire TV. We've done a lot of work there. There's more we have in mind still. And then the user community at Starkey through a group of actual Starkey customers who we reached out to in a clinical study also gave us really great feedback and helped iterate.

At Amazon, one of our philosophies about accessibility, is we want to ship the feature when it offers substantial value, and then keep investing and make it better and better and better. There's so many people, as you said, right, the remote fight at home, the volume fight, who want this technology. And we felt it was a strong V1 feature. And we look forward to continuing to improve it over time.

Achin Bhowmik:

So I want to echo what Peter said first about just amazing team collaboration that took us to this point, between my team at Starkey and Peter's team across Amazon working really hard to bring this feature in ways that despite limitations of current technology, that Peter explained very well about Bluetooth low energy, having range issues and how many devices he can support, generally just one, right? But despite all of that, making it easy for customers to connect



and then enjoy. I think we did an amazing job between the two teams to bring this feature. We are only getting positive feedback about it. And first I hope Peter and I will come back and talk to you again to your audience about the amazing roadmap that we have in mind. As the technology progresses, this is only going to get better and more adopted. But out of the gate, I think the sound quality, we started the conversation with sound quality, just stunning feedback that you're getting about the quality of sound from Fire TV stream directly into the hearing aids.

Another point that, Dave, you made, the old days of plunky set up that would've required a relay device to be between the two, which is what our patients have been used to for a long time. But with direct connectivity like this, it just changes the conversation and adoption of the technology. So I'm really happy with not just how detailed testings we've done between the two teams during the development process to get to the best user interface we could. And then the feedback that we are getting from the customers now, and the work that you're doing together between the two teams on improving the technologies as the Bluetooth technology advances towards future intelligence of it. I'm really excited about it.

Dave Fabry:

Yeah, no question. And I think as you mentioned, V1, I love the approach of getting the product in the consumer's hands. Start getting feedback on that for the number one important use case of them wanting to be able to stream television directly to their hearing aids with outstanding sound quality for news, music, movies, whatever media, as you said, that's embedded in the Fire TV and making that as seamless a process as possible and look forward to in V2, V3 in terms of making that. I think people take for granted the handoffs that have to go and take place. Like you said, Peter, the use case of getting a phone call or wanting to talk to, and input other questions and things. And there's a lot of handshaking that goes on and that may seem in the end, if it seems dead simple, it's likely that it's embedding a lot of sophisticated handshaking behavior. And I know that there was a lot of effort required on the parts of the teams on both sides to do that.

And then looking at the way that we can turn this into a V2, V3, more of a shared experience with family members and being able to have everyone in the room enjoying at their own level and then preserving and continuing to enhance that user experience for all family members moving forward. And I'm really excited about what's in store for the future in this partnership. And I appreciate your both sharing where we are today.

Achin or Peter, any advice for professionals that might be listening today, who are looking at a future where maybe designated, we currently, as you know Achin, we have dedicated accessories that are used for a single purpose in a specific situation.



I think looking at the way that we can partner with Alexa, with Fire, with all of the different ways that we can interface into the cloud, as you said, and that we're already doing so with our virtual assistant, not having single purpose devices, but having the Amazon serve as the brain, if you will, and the air traffic controller for how to communicate in this fashion, anything you can tease on?

Achin Bhowmik: So maybe start and let Peter add to it from Amazon perspective. I think you brought about advice for professionals. So I would say our professionals, audiologists and ENT experts for decades, they focused really hard on how to optimize the hearing experience by deep characterization of your hearing loss and neurobiology of it, measuring your audiogram and then tailoring and fitting the device in ways that really truly delivers the technology benefits to the patients. I believe this collaborative venture with Amazon brings about and another dimension for them to deliver value to the patients. And that is their life within an ecosystem of technologies. This provides an additional excitement about the professionals talking about new technology. Hearing it still have a little bit of a stigma. Peter mentioned nearly half a billion people are living with disabling hearing loss, yet the industry collectively ships only 18 to 20 million hearing aids a year around.

Dave Fabry: Around the world.

Achin Bhowmik: So I think we can do a whole lot of good through these kind of collaborations to elevate the conversation about, first of all, the devices are not the old ugly designs, and through these collaborations, we are expanding their value. Now it's no longer just hearing the people's conversation, but also streaming directly from your multimedia that you do for multiple hours a day. So I think I'd let Peter add to it, but I believe where we started is the beginning, and where we're going to go to it's going to be increasing in terms of the value that have been brought to the professionals who are going to benefit from it as they interact with the patients and provide their service.

Peter Korn: It's such an exciting time. I think, to be serving customers with hearing loss. The substantial technology advancements that we can now harness to meet customers' needs. Affordability and mainstreaming of accessible technology is so much better now than even just a few years ago. Customers don't have to give up so much as their hearing and other facilities decline. And our work to make our first device, the second edition Fire TV Cube, work with Starkey hearing aids is just the most recent facet of our deep commitment to serving customers with hearing loss. I think about the technologies that are in the labs right now around machine learning, around using multiple microphones for beam forming. I think about the increasing power, computing power that we can deliver on that just barely sips energy from our batteries, and the increasing wireless technology.



We are going over 100 megabits per second in the latest generations of wi-fi. And all of that is coming forward, miniaturization to where we can fit it in a tiny device on your ear, in your ear, lasting all day on a battery, and still connecting with the consumer devices all around you that are so critical for our lives.

Dave Fabry: At every age, we're connected deeply and continuously kind of continuously connected.

Dave Fabry: ast question for both of you. We're in this issue of, and talking about innovation obviously, and you're both leaders in technology and innovation, but the hearing aid industry, I think to be fair 10 years ago, we were rather provincial as somebody that's been embedded in the hearing aid industry for nearly 40 years this year, we tended to always want to invent everything here and in our backyard. And I think one of the things that Achin really brought when he joined us is the importance of collaboration, rather than always having to invent everything. Can both of you talk about maybe one lesson or something you could share with the professionals or consumers listening to this about the benefits of collaboration on innovation.

Peter Korn: I'll go ahead and start. Great ideas come from everywhere. Not just your team, not just your company. It's so important to work backwards from the customer, to work backwards from their needs, to talk with people who are already serving those customers, addressing those needs. When you think deeply about how to solve the really hard problems like great listening for all day long in noisy bars with your friends, and music in the background, these are the problems that give rise to opportunities to make life changing innovation and life changing difference in the world. Those are hard problems, they're hard to solve alone. And so collaboration is really key to solving lots of these.

Dave Fabry: Excellent. Thank you.

Achin Bhowmik: Yeah. I just want to say, so I would just add to that, but I would start with what Bill Austin, our founder, constantly tells us all the time. Alone, we cannot do much, together we can accomplish a whole bunch more, we can change the world. That is just today's world. If we are not collaborating, first of all, within organizations in a company, it's dead. And then between companies, if we don't collaborate, we're going to be very limited in new values we can bring to these customers, patients before us. And this is just an example of, this morning, I talked to 200 customers about the sheer excitement on the transformational impact that's ahead of us, with artificial intelligence. This requires collaborations on all fronts, starting with, Peter explained the challenges of the computing engine and connectivity of this devices. So we have to do 10X in terms of how much compute at the same level of power we can embed in the device in the ear alone.



And then we look at connecting this with the most powerful computers in the cloud that companies such as Amazon brings to your fingertips, and they need to work together in the way that I can do real-time language translation in the cloud and bring the translated language privately into my ear. Just one of many examples where true collaborations between these powerhouses are needed in order to deliver completely new value that will just obsess our customers with our services and products. It's a word that I'm borrowing from Jeff Bezos. And today, and our example is a good one where companies in their domains can reach out and collaborate with companies benefit their patients. Here, our patients are benefiting from our collaboration with Amazon, and so Fire TV's customers would benefit from the amazing new feature in our hearing aids. One of many things that we can do together. Thanks for the great question.

Dave Fabry: Well, I'm so grateful to both of you for the time today, talking about these topics and also for the collaboration, and Peter, especially coming from somebody who's dedicated my career to audiology and to working with patients who have hearing loss, but then someone who suffers some visual handicaps, myself. I really appreciate the work that you're doing on behalf of people with disability, for improving accessibility and thank you for that effort and the work and the great strides that you've made.

And to our listeners, we thank you for listening to this episode of Starkey Sound Bites. And if you enjoy the conversation, please rate and review us on your preferred podcast platform and share with your friends and your networks. You can also follow us and subscribe, so that you don't miss a single episode. And once again, Peter and Achin, I really appreciate your taking the time today to be with us.

Achin Bhowmik: Thank you.

Peter Korn: It's been my pleasure. This is one of the most enjoyable parts of my day, is getting to talk with colleagues and to speak to customers.

Dave Fabry: Well, thank you for doing so, and have a good rest of your day.