

Advances in Assistive Technologies

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(Music playing.)

>>ANNOUNCER: Welcome to Disabilities at Work Radio, where every week we explore issues, ideas, initiatives and innovations involving the employment of people with disabilities. We feature employers that go beyond compliance in supporting people with disabilities in the workplace and elsewhere.

We bring you prominent members of the business community, service providers, government officials, researchers, educators and people who successfully manage their disability and careers. Join us now for Disabilities at Work.

>>RAY ZARDETTO: Hello. I'm Ray Zardetto and welcome to Disabilities at Work Radio here on the VoiceAmerica Business Network. Each week at noon Eastern Time, Disabilities at Work Radio explores

the issues, the ideas and initiatives involving the disabled in the workplace and discusses them with prominent members of the government disability and the business communities.

And when it comes to prominent members of the business community, there's probably no more iconic name than AT&T. From the day Alexander Graham Bell spoke to Thomas Watson through his acoustic telegraph in 1876, through its incorporation in 1885 and its growth into the Bell system into the 20th century, followed by two significant divestitures, AT&T today remains the largest communications company by revenue in the world. And AT&T still is the backbone for communications services around the world. Its network moves over 18 petabytes of traffic on any given business day. Now, for most of us petabyte is probably not a number we can wrap our arms around, but it's a quadrillion bytes, and if that doesn't help, it's a thousand terabytes. And if that doesn't make any more sense to you than it does to me, you can think of it this way: If you took all of the data in all of the academic libraries in the United States, that would equal about two petabytes; and when we talk about the AT&T network, we're talking about 18 petabytes of traffic moved per day. So that's an astounding amount of data moving across a network every day.

And to keep that network going, it takes a lot of people, a lot of professionals who really know what they're doing. And I use all that in the intro to today's show, because AT&T is our sponsor today on Disabilities at Work Radio. And joining me are three

members of AT&T. First of all, Rachel Book, the Senior Manager for Talent Attraction; also, Evelyn Walker, Diversity Manager, and Elizabeth Dixon, the Senior HR specialist for Diversity and Inclusion for AT&T.

So let me first welcome my three guests to the show. Thank you for joining us today.

>>RACHEL BOOK: Thank you for having us.

>>RAY ZARDETTO: My pleasure.

Let's start with you, Rachel. What I just described is a huge network that takes a lot of people and a lot of professionals to keep it moving. And so from AT&T's point of view, I know you're always looking to hire the best and the brightest, and when it comes to people with disabilities, which, of course, is the focus of our show, I think that's also something that you do very actively. So let me ask you first about the application and the hiring process that AT&T focuses on when it comes to people with disabilities.

>>RACHEL BOOK: Okay. Well, first of all, everything that we do when it comes to recruitment and when it comes to attracting talent to our company is completely accessible to everyone. So our diversity in disability recruiting definitely has a stronger focus, but it's really incorporated into our entire strategy nationwide and function wise.

When it comes to reaching out specifically to candidates with disabilities, the first thing that we do is make sure that our jobs -- all of our jobs -- so all, gosh, sometimes we've got about

2,500 external job postings, they would go out to some disability -- to some career sites that are geared specifically towards the disability community. And some examples are Disaboom Hire, AbilityLinks, disabilityjobs.org, disabledperson.com and Disability. So we're definitely getting that message across.

The other thing that we make sure is that our entire career portal, so our career site at att.jobs, we want to make sure that that site is accessible to individuals who are using assistive technology. So anyone who is using a screen reader will be able to access our career portal, and we've actually gone through the process to certify our career portal by Earn, which is a government partner that makes sure that the site is programmed in a way that it's successful to everyone.

The other thing that we do is we make sure that all of our videos on our site, some of them are testimonials from our employees, some of them are realistic job previews, some of them just share some really cool stuff about AT&T and our technology. So all of our career portal videos are closed captioned in English and Spanish to make them accessible to everyone.

>>RAY ZARDETTO: I'm just curious, as far as you know, is this unique relative to other companies, other corporations and their websites, do you know?

>>RACHEL BOOK: I know that the, that our U.S. government makes that service available, but I'm guessing that there are many companies that may not know about it and may not have taken advantage

of it.

>> RAY ZARDETTO: Do you find -- just other one side question on that. Do you find that because you are AT&T, and of course you had over the years some of the most powerful R&D arms between what was once Bell Labs and is now AT&T Labs, do you find you have a little bit of an advantage that way because you're able to apply many of the same technologies that come out of the labs?

>> RACHEL BOOK: That is a good question. I think that we'll all hear later on in this radio program about some of the assistive technologies that come out of our labs that benefit entire communities of individuals with all kind of disabilities. But I think that, you know, a lot of the maybe speech recognition technology that has been developed out of AT&T labs over the past whole bunch of decades can probably have an impact on recruiting technology in general over the course of the next few years.

>> RAY ZARDETTO: Good, thank you.

To continue on the thought of, or at least the discussion about AT&T and attracting people with disabilities, Evelyn, I understand that AT&T has quite a number of partnerships and outside events in which the company participates and maybe you can talk a little bit that for us?

>> EVELYN WALKER: Sure. Yes, we have recently formed a partnership with Ticket to Work. It is a government funded program that provides employment opportunities for civilians and veterans who are receiving social security income and social security

disability income. And these individuals are really desirous of returning back to work. And so we partner with them; they're able to post for our jobs; they're considered for employment, and we are continuously exploring other initiatives to target individuals and recruit individuals from our disability and disabled communities.

And we also recently, we have formed a partnership with Career Opportunities for Students with Disabilities. And these, this particular program, it helps recruit, help us recruit college graduates with disabilities. We attend their annual student summit and their employer conference. And this is the second year we participated. This year we actually participated and represented on the AT&T Employees Best Practices panel and we were able to interact with students. We've identified potential students for our management programs within AT&T, so it was an excellent event and we continuously recruit for college graduates. We're also affiliated with the Gateway Portal, which is an affiliate, they have about 500 other colleges and universities who are partners with them and they're able to view our jobs, apply for our jobs.

We have also, in recognition of National Disability Awareness Month, for about three years, AT&T has hosted a career fair, a disability career fair. And we recently held a career fair here in Atlanta. There are about 46 managers, HR managers that represented about 36 companies. And some of those companies were the EPA, the IRS, FEMA, CDC, Habitat for Humanity, USDA, just to name a few.

We've also partnered in recognition of the National Epilepsy

Foundation Month, which is this month. We partnered with the epilepsy foundation to produce a video. It's in its editing stages now; that should be ready in about a week. And we just wanted to bring some awareness internally to our staffing teams. Because we, as Rachel mentioned, we incorporate disability recruitment in all of our diversity initiatives, and we just want to bring awareness to our staff and teams in recognition of Epilepsy Awareness Month.

>>RAY ZARDETTO: Okay. Before you go on, I just wanted to go back to one thing. Walk me through now, when you go to an event for something where you identify, for instance, a student who you think might be a good candidate, walk me through what happens next after the event.

>>EVELYN WALKER: Right. After the event what we've done, we've identified these high potential candidates and we actually process them as executive referrals. And the person who's in charge of that program will contact that individual. They advise them to search our job site to determine what jobs they're actually interested in. And we've had, the students that we've identified, they were high potentials for IT, for engineering and finance. And so we take them through the process, this manager within AT&T who handles the executive referrals pretty much introduces them to the potential department within AT&T that they will be looking at them for a potential match for hire. And she actually takes them through every aspect of the hiring process to make sure, you know, that they're employed at some point within the employment process.

>>RAY ZARDETTO: Okay. And I'm just also, just to carry on that thought for a minute before we go on, because you also mentioned as you were talking about getting information out and making hiring managers and recruiters aware of disabilities month and some of the other peripherals to that, I do want to talk about that again later. But when you talk about hiring people with disabilities, I know AT&T has employee resources groups, one of which I think is probably focused on people with disabilities; is that correct?

>>EVELYN WALKER: Correct. As a matter of fact I'm a member of that employee resource group. It's called Ideal Individuals with Disabilities Enabling Advocacy Link. And they are involved -- we are involved in the community and we make sure that we have our finger on the pulse for accessibility. We advocate for employees and for individuals with disabilities in our communities to ensure that they are granted the same accessible products and services and that make life, you know, manageable for them. And so we just want to make sure that we are engaged with all of the initiatives that impact the disabled community.

>>RAY ZARDETTO: Great. All right.

We have a lot more to talk about, but we're going to take our first break. When we return, more on AT&T's programs to support people with disabilities with Rachel, Evelyn and Elizabeth. And later in the program, as Rachel even mentioned earlier in this segment, we are going to look at some of the technological innovations being developed and introduced by AT&T Labs that will improve the

lives of people with disabilities. So stay with us. I'm Ray Zardetto and this is Disabilities at Work Radio.

(Music playing.)

>>ANNOUNCER: Disabilities at Work encourages people with disabilities, their families and their supporters to patronize businesses that have earned the right to display the Disabilities at Work logo on wall plaques, window decals or websites. By some estimates, people with disabilities control hundreds of millions of dollars in disposable income. They can use that spending power to send a message to corporate America. Become a Disabilities at Work business or a registered agency with the power to endorse supportive businesses at the Disabilities at Work website, www.disabilitiesatwork.org.

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an engaging conversation with women who are boldly committed to living their most amazing life. You'll discover ways to step into your greatest vision, deepen your relationships and unleash your real creative brilliance. Get ready, it's time to jump into the conversation. That's Monday afternoons at 1 p.m. Pacific, 4 p.m. Eastern. For the Marsh Engle show, on the VoiceAmerica business network.

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>>ANNOUNCER: You are listening to Disabilities at Work Radio. We welcome questions and comments from our listening audience, which you can send to us on Twitter at DisabilitiesAt or on our Facebook site, Disabilities at Work. Also visit disabilitiesatwork.org. Welcome back.

>>RAY ZARDETTO: And welcome back to Disabilities at Work Radio here on VoiceAmerica's Business Network. And again, this week's show is being brought to you by AT&T. I'm Ray Zardetto and I'm speaking with Rachel Book, Evelyn Walker and Elizabeth Dixon from AT&T and we're talking about AT&T's programs to both attract, hire and retain people with disabilities in their workplace. And before the break we just took, I think Evelyn was talking a little about IDEAL, the employee resource group that focuses or works with people with disabilities in AT&T. And Elizabeth, I know that you also had a few things that you wanted to add about that.

>>ELIZABETH DIXON: Yes. Thanks, Ray. I actually am a founding member of IDEAL and I also am responsible for all of AT&T's employee resource groups, we have 10 of them and they interact very well. Ideal was started by several people with disabilities in the early 1990s. It started out as a group of employees who reviewed products and services, basically in AT&T Labs, for accessibility and usability by people with disabilities.

>>RAY ZARDETTO: It really had an external focus when it started?

>>ELIZABETH DIXON: It had both an external and internal focus, because AT&T employees are also AT&T customers.

>>RAY ZARDETTO: Right.

>>ELIZABETH DIXON: So we thought to add the specific value add to the company by reviewing products and services, everything from actually building accessibility within our system to voice technology and text-to-speech technology and many other technologies and information. That group morphed into an advocacy role because people kept calling us and asking us to be advocates within the company. So we worked on streamlining the accommodations process or helping employees through the accommodation process, providing mentoring opportunities, as both mentors and mentees, to employees with disabilities and connecting them sometimes with officers as mentors.

>>RAY ZARDETTO: And do you know about how many employees are part of that resource group now?

>>ELIZABETH DIXON: There are over 200 employees now as part of it. Now I hasten to add, one does not need to be an employee with a disability to be a part of this organization. But --

>>RAY ZARDETTO: In fact --

>>ELIZABETH DIXON: -- probably the vast majority are.

>>RAY ZARDETTO: I was going to say, sometimes in fact it's better if not all of them are, because it's more of an outreach that way, I suppose.

>>ELIZABETH DIXON: Absolutely.

>>RAY ZARDETTO: Good. Let me go back to Evelyn for a moment. As we talked about some of the initiatives and partnerships and some of the other programs you're involved in. I think it was last week, November 11th or 12th, that AT&T just made an announcement with an interest, a company called Alorica, having to do with helping American veterans who are disabled and I wondered if you'd talk about that for a minute?

>>EVELYN WALKER: Sure. Alorica. This is a pilot program and basically what it is is we've partnered with Alorica and they staff, it's a call center entirely with veterans with disabilities. And the program launched in partnership, again with Alorica. It provides veterans with an opportunity to regain independence by providing customer care for AT&T business customers, our small business customers. And the company recruits and retains and it hires disabled veterans to provide customer service and technical support. It is a pilot program. It was recently launched here in

Atlanta, and it employs about 60 veterans; it will employ 60 veterans by March of next year, and the veterans will serve as frontline customer service representatives, and also in supervisory capacity to assist our customers. And it's a very good program that we're launching and it is a pilot right now, but I'm sure it will be extended based on the success of the pilot program that they're going to be serving as a support team, working with Alorica, and we intend to extend the program after the pilot.

>>RAY ZARDETTO: Very good. So essentially the veterans are on the other end of the phone. They're customer service representatives for AT&T; is that essentially it?

>>EVELYN WALKER: Essentially, yes.

>>RAY ZARDETTO: Very good. Now Rachel, let me come back to you again for something that we talked about at the top of the program, which was about how AT&T hires and attracts talent. I would have to think that as part of, part of that program, it's not just what you do, but what you have others do as well for you, whether you're talking about the hiring managers throughout AT&T, being as large company as it is, but also recruiters and whatever, with regard to hiring people and supporting people with disabilities. There's an educational process involved there, I suppose.

>>RACHEL BOOK: Absolutely. And in fact, our participation in this radio show, this Disabilities at Work radio show, really came from an event that AT&T hosted in New Jersey back in April. And we co-sponsored the event with the Work Force Investment Board and

United Way, and there were a couple of other organizations that were involved. But we brought in some lecturers from Cornell University and they provided a really great program to employees of AT&T, as well as guests from some other companies in the New Jersey area, on creating a workforce based on ability. And basically what they were explaining, they were -- they were providing the training for people who may not have disabilities to understand how to be sensitive to individuals who do have disabilities and how we can create and innovate within our workplaces to make our disabled employees more comfortable.

And so, after that, what we've done is we've built sensitivity training for our recruiters and our hiring managers on interaction tactics with disabled candidates, when they attend events and job fairs or when they interview in person, and we've also built an online tool kit for our staffing managers and our recruiters on disability awareness. Some of the information that we share is some statistical data around individuals with disabilities, how many of them tend to be more productive, and that the average cost for providing an accommodation is not as expensive or even as complicated as the hiring manager may think.

>>RAY ZARDETTO: As a matter of fact, in some of the programs we've had here, we always find that that's one of the topics that comes up - which is, or actually two things. One, the concern about accommodations; and second, the, there's this kind of almost psychological reticence that some people have about needing to deal

with, or you know, needing to deal with people with disabilities, what do you say to them, what do you not say to them, things like that. So I assume that this program also deals with that as well?

>>RACHEL BOOK: Oh, absolutely. There was some great information shared about, just some examples that I remember are ways to offer assistance in a very sensitive way. One of the instructors who uses a wheelchair mentioned that what really bugs him is when people around him are either tapping their feet or tapping their pens or doing something that creates a vibration on his chair. So even just being sensitive to things like that that many of us would never have even thought of, it's great to share with all of our hiring managers and our recruiters.

>>RAY ZARDETTO: That is very interesting. Those are the kinds of things that you would never think of off the top of your head and at the same time isn't something somebody is doing intentionally or, you know, because they're insensitive or anything; it's just, you know, something somebody wouldn't necessarily have in their mind as something to be careful of. So that's very good.

Rachel or Evelyn or Elizabeth, if somebody wanted more information about the programs we've talked about regarding AT&T and people with disabilities, what would be the best way for them to get more information?

>> I would say move on over to www.att.jobs. That is our career portal. There's a great section on there on diversity, which includes a lot of our disability partnerships, as well as our awards

that we've won. There's also some great information on att.com, and we'll be sharing some links with the Disabilities at Work web page that Ray will reference a little bit later, where we'll share some information about AT&T as a company. Even outside of our hiring or recruiting practices, per se, where we've made great strides in accommodating our customers and our communities within the disability community.

>> RAY ZARDETTO: Great. Very good. Rachel, Evelyn, Elizabeth, I want to thank you very much for joining us for the first half hour of our program today. Very good discussion, very informative. I appreciate your being with us. Thank you.

>> Thank you.

>> Our pleasure.

>> Thank you.

>>RAY ZARDETTO: When we return we're going to be joined by some distinguished members of AT&T Labs for what I think is a fascinating discussion about some of the new technologies being developed in and coming from AT&T Labs that can help make better the lives of people with disabilities.

And before we go to break, let me invite all of you listening to join our tteam at disabilities@ and friend us on Facebook at Disabilities at Work. So stay with us. There's still more to come. I'm Ray Zardetto and this is Disabilities at Work Radio.

>>ANNOUNCER: Disabilities at Work encourages people with disabilities, their families and their supporters to patronize

businesses that have earned the right to display the Disabilities at Work logo on wall plaques, window decals or websites. By some estimates, people with disabilities control hundreds of millions of dollars in disposable income. They can use that spending power to send a message to corporate America. Become a Disabilities at Work business or a registered agency with the power to endorse supportive businesses at the Disabilities at Work website, www.disabilitiesatwork.org.

>>ANNOUNCER: This is Ed Krell, CEO and president of Destination Maternity Corporation. Since 2001, we've been working together with the March of Dimes for stronger, healthier babies. Did you know that in America one in eight babies is born too soon? Those who survive their early birth can suffer serious and sometimes lifelong health problems. Help bring healthy babies home. Join Destination Maternity and the March of Dimes in fighting premature births. Go to marchofdimes.com.

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>>RAY ZARDETTO: And we're back on VoiceAmerica's business network, this is Disabilities at Work radio and I'm Ray Zardetto. Today's show is sponsored by AT&T. And for more than a century, AT&T has been the benchmark for communications quality in service and product. Today, the company operates the nation's fastest mobile broadband network. It offers the largest international coverage of any U.S. wireless carrier, the largest Wi-Fi network in the United States and it has the largest number of total broadband connections in the United States. And to think it all started with Alexander Graham Bell. In fact, Bell himself was profoundly linked to any discussion we would have regarding people with disabilities. His wife and mother were both deaf, and although he's thought of today as an inventor, Alexander Graham Bell actually dedicated his life's work to helping and teaching people, especially children, who were deaf or who were deaf mute. And in fact at one point Helen Keller was one of Alexander Graham Bell's students.

And I say that because now today AT&T Labs is the R&D arm of AT&T and continues the work that Bell championed over a century ago, and today we're going to talk about some of the new generation of technologies coming from AT&T Labs. And here to help me do that are Jay Wilpon, Executive Director, Speech Services Research at AT&T Labs; Amanda Stent, a Principal Member of the Technical Staff at AT&T Labs; and we're also joined by Bob Miller, the Executive Director of Communications Technology Research at AT&T Labs. So let me first extend a welcome to you all. Thank you for joining us.

>>Welcome.

>>RAY ZARDETTO: Good. And Jay, let me start with you, because I want to discuss speech recognition technology at the start here. I think a lot of us associate speech recognition technology with the automated telephone answering services we hear when we call our bank or other service businesses, but it's really a lot more than that, isn't it?

>>JAY WILPON: Yeah, it really is. I mean, people tend to think of when they call into a customer care and get information that that's all that speech recognition does. But it does so much more, especially in the area of assistive services. Certainly if somebody is, let's say hearing impaired, you want to be able to take the spoken word and turn it into a written word, whether it's a movie or a TV show or whatever, so speech recognition can be used for that. Things like voicemail, someone might leave a message on their phone and the person can pick up that message by having the audio turned back into

text. And similarly, the other side of the technology, what we call the text to speech synthesis, if somebody is visually impaired, the technology could read to you, whether it's web pages or letters or e-mails or anything else. So those two technologies together form a huge basis of providing and enabling people that need assistive services to get them.

>>RAY ZARDETTO: How long has voice recognition technology been around now?

>>JAY WILPON: Well, from a user point of view that I think is useful, probably since the early '80s. We started doing research on it in the '50s. And now it's becoming very pervasive, especially in the mobile environment. Because as these phones get smaller and smaller, people have a hard time of typing or don't like typing, especially if you look at the disabilities community, it's even more difficult for them to interact with those devices.

>>RAY ZARDETTO: Yeah. And I remember some of the early generations of it, there was always challenges around, you know, how does the data read accents, the different pronunciations and words and things like that. Have we pretty much gotten over all of those hurdles?

>>JAY WILPON: By and large, I mean, we get more and more data which helps train our models so it recognizes more and more people better. We still haven't solved world hunger from the technology point of view, but things that it's doing now compared to what it was doing even five years ago are tremendous. We can recognize, like

I said, general dictation of e-mail and SMS messages. We've got a partnership with a company called VLingo that actually provides that using our Watson speech recognition. It's no more just press or say 1. There's a lot more capabilities, which, then, if you start looking at applying it for the disabled community and the elderly, there's a lot more they can do with it now than just, you know, answering a phone and talking to a customer care agent.

>>RAY ZARDETTO: Right. So given that we've come this far since the first applications of it about 10, 15, 20 years ago, where are we over the next 10 or 20 years or the next couple of generations of it? Where does this take us?

>>JAY WILPON: That's a good point. I think the technology is going to take us a long way especially in the space of assistive services. Let me give you some examples and I'll let Amanda give you examples of some of the few things that we've been showing, because they're actually quite impressive. So let me have her answer that.

>>RAY ZARDETTO: Go ahead. Amanda, please.

>>AMANDA STENT: So let me tell you first of all about a really exciting new service we're developing called Safe that will help people with disabilities be much more independent. So as you know, often password forms are hard for people with disabilities to fill out, for example, to get access to human resources information online or to sign into your network at work. And people with memory loss also have a hard time remembering these passwords. So Safe

replaces passwords with biometric factors such as your voice, and things that you know which are processed using our Watson automatic speech recognizers so you might just read a sentence and you're in. And nobody -- these biometrics are very secure, much more secure than passwords.

Another thing that we're working on that can really help people with disabilities at work is an eReader prototype. The eReader prototype reads eBook formats but it also reads RSS feeds such as AT&T puts out for employees. And it works on a regular computer, and the speech recognition and the text to speech are in the network. So the user only has to install the basic eReader and then they can read any of the materials that are coming in using any of our natural voices, and they can interact with the eReader using keyboard shortcuts or if the user doesn't have the ability to use a keyboard, they can use speech commands. For example --

>>RAY ZARDETTO: So for these, they don't need to download a lot of software to their computers or anything like that?

>>AMANDA STENT: No, that's the key. Our speech recognition and our text to speech now are in the network in the cloud, so that people with disabilities can easily use them without having to go through a big install step. And furthermore, companies that want to work with us to develop assistive technologies can use our speech recognition and our text to speech engines without themselves having to maintain these services.

>>RAY ZARDETTO: If you could do me and my listeners just

a quick favor. When you say that it resides in the cloud, exactly what does that mean?

>>AMANDA STENT: Ah, so AT&T you know is a network company. We have computers all over the world. And these computers network together to form what we call a computing cloud. And that means that applications and services like speech recognition and text to speech can be on any computer, not your computer, and you can still access them and use them.

>>RAY ZARDETTO: Very good. Thank you.

That's very -- that's very mind bending stuff when you think about some of this. Where do you think people with disabilities will be in terms of the next decade or so in using these kinds of technologies when it comes to the workplace?

>>AMANDA STENT: Well, we think it's really all about speech. We see speech as a tremendous enabler for people with visual disabilities, people with hearing impairment and people with mobility impairments. We see people using, come into your workplace in the morning, sign into your computer and your network using speech, using our Safe application, read your e-mail using our eReader application, listen to your voicemails, using our voicemail to text application, and then perhaps send some e-mails using dictation with our speech recognition, dictate a document, or have a conversation with someone that's automatically transcribed and indexed so you can search through it later.

>>RAY ZARDETTO: Great. I appreciate, Amanda, I appreciate

that information. That's really great.

We have a lot more to talk about, in terms of this new technology. In fact, when we come back after our next break, we're going to discuss some other technologies coming down the pike, especially some that are focused in the health care industry, which is something you might not think of in terms of AT&T, but you'd be surprised to know that not only are they in it, they've been in it for a long time. So very interesting discussion yet to come. So stay with us. I'm Ray Zardetto and this is Disabilities at Work radio.

(Music playing.)

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(Music playing.)

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>>RAY ZARDETTO: And welcome back to Disabilities at Work radio. Remember that Disabilities at Work radio can be heard each Wednesday at noon Eastern Time on VoiceAmerica's Business Network.

And this is Ray Zardetto and for this half hour of our program I'm speaking with Jay Wilpon, Amanda Stent and Bob Miller from AT&T Labs.

And for this next few minutes I want to talk with Bob Miller about some specific applications of technology in the medical and health care arena, which we may lose sight of some of this technological advancement with all of the discussions going on about health care in the legislative process in Washington. But Bob, AT&T is no stranger to helping or providing technology in the medical industry going back. I don't know, probably to Bell himself with the work he did, right?

>>BOB MILLER: Indeed. Many folks may not know it, but Alexander Graham Bell actually tried to assist the doctors who were treating President Garfield trying to remove an assassin's bullet by developing a device to find the bullet. Unfortunately, the technique didn't work because Garfield was one of the first people in America to use metal coil spring bed. And it confused the machine. But as you pointed out, AT&T has a long and proud history in medical devices and technologies and, for example, I've worked on medical devices off and on since the mid '70s. So, you know, I think lately the transformation of a lot of facets of human life have been guided by the availability of additional knowledge and networking that knowledge.

So what we've been working on is to provide a networking capability for next generation sensors, including medical sensors.

>>RAY ZARDETTO: And just to give everybody some grounding.

If somebody were to ask you, you know, over the course of its existence, what are some of the biggest contributions AT&T technology has made in the medical and health care fields? What are some of the things you would tell them?

>>BOB MILLER: Well, I think, you know, AT&T has pioneered video, for example, and worked on making video smaller and more implantable, if I could call it that. Jay has already outlined the many contributions of AT&T for the deaf. And AT&T, for example, my work in the '70s was intended to assist with medical telemetry to examine two things. One was the effective hyperbaric oxygen on people who had senile dementia, and also monitoring of cardiac patients in real time. So it's kind of ironic now that radio has become ubiquitous, we're revisiting all these things. I think many people realize that as they age, in effect we all pick up chronic diseases that eventually provide some level of disability. And although many of us use medical instruments now, including, for example, blood pressure meters and glucometers, etc., I think the difference is that the measurements provided by those instruments are today recorded largely by pen and paper or by largely outmoded means of transferring data, like old style analog modems with regular old telephones. But we're now entering a networking environment where this information can be made available via radio in real time. So this is not only important because it provides immediate notification of trouble, but it allows your doctor to see your body behaving both normally and abnormally on a sort of repeated sampling

basis. So that means diagnoses can be much more reliable, detection of difficulty can be much earlier and treatment more effective. So I think it's going to be transformative, not only in terms of the quality of life particularly with aging Americans, but also people who are disabled and doing well, but would like to do better.

So, you know, I think all of this is heading to the point where monitoring of our health aspects and indications may be largely automatic and frankly not a conscious product of our work, meaning you can wear sensors that effectively would communicate your vital signs without your knowledge or supervision and it will simply be accumulated is a kind of history of you. And it will be much easier to spot things that might be going wrong.

And in the end I fundamentally believe this technology cannot only be used to allow people to age in place independently a lot longer, but to work in the workplace with more assuredness that they'll basically be attended to.

And in the long run, I foresee that we'll be monitored completely enough that we'll essentially have a learning capability that can tell us when we should seek medical help or advice. And I like to think of this as a so-called, "check engine light" for people. And that it will be enabled by what I like to call electronic medical jewelry. I mean, we all wear belt buckles, watches, shoes today. Something we wear without thinking. And all of these can become medical instruments.

So before too long I fundamentally believe that we'll have

available, for instance, multipurpose medical devices, that you wear as part of your normal routine. We're working on one, for example, that is an earpiece like you would use for your cell phone, but it not only incorporates the regular functions of an earpiece, it can also be a hearing aid, a thermometer, a fall detector, a pulse oximeter and you know a measurement capability for other things. So I fundamentally believe this is another example of how AT&T is helping to improve the quality of life and the effectiveness of medical treatments. I think it's an exciting time.

>>RAY ZARDETTO: It certainly sounds like it. In fact, to bring Jay and Amanda back into the discussion as well, as Bob describes all of those upcoming generational improvements in the technology, the one thing I hear as he says all that is man, that's even more and more data to add to the 18 petabytes per day of data that goes across the AT&T network. So all this data has to reside somewhere and I guess that gets back to the discussion we had at the end of the third segment about the cloud and where to store all this data and how to move it around efficiently, right? Jay, would you address that?

>>JAY WILPON: Yeah, I think it shows two things. One is all the processing is done is one from the data. You know, on our side, from the speech technology, you know, as opposed to -- people want devices that are small and expensive, you know, manufacturers don't want to spend a lot of money to build them, so you've got battery life and whatever. So if technologies can reside in the cloud and

people that write applications that need technology instead of buying licenses and buying hardware or managing software on a device, if they could have a very small, cheap device where all the technologies in the cloud and it's just accessed, I think you're going to get a lot more people that will build the applications and services for people that are disabled and for anybody. Right now one of the barriers I think to entries for people building services for this market segment is that they don't want to take a risk. They may not want to take a risk and spending a lot of money to buy stuff before building applications. Whereas the more and more we can have things reside on the network, the cheaper and less risk. And you could have mom and pop garage store person can build out all the services they want because they don't have to do any investment. And I think the same thing is going to be true with data. You know, we're used to storing -- I'll let Bob throw in, too, but we're used to storing lots of data. I mean, that's what we do. And, you know, we've already talked about the words that come after peta and I think Bob, Bob, have you told us what those words were? What were the words after peta?

>>BOB MILLER: I don't even remember.

>>JAY WILPON: They're very weird words.

>>RAY ZARDETTO: Yeah, they really are, but it just adds more and more zeros after the number, right?

>>BOB MILLER: I think a very useful thing is to realize that those databases are going to change from what we think of data today

to be essentially multimedia data which may be video, audio, real time measurements of various medical parameters. I'll give you an example. In fact we're doing a trial that you might have read about with a major university on what are called smart slippers. These are designed to telemeter gait characteristics with every step that a person walks. And the devices are called smart slippers. And basically the patients in the trial wear them so that by analyzing that flow of data, which is quite substantial, you cannot only determine if a person has fallen, but also if a person is walking unsafely due to bad medication or forgetting to take the meds or whatever. And those people can actually be warned in real time to sit down. And this is a real comfort to caregivers.

But as you quite correctly point out, it amplifies the amount of data that will be collected by many fold.

So having all of that in the cloud, indexable, findable, interpretable, shall I say made available in a time frame that can do real time learning, that's going to be a real challenge, but we're already working on it.

>>RAY ZARDETTO: Is there any projection at all as to how much data would be flowing through a network like yours in say another 10 years?

>>BOB MILLER: Well, it may be as much as a megabyte per person per day. Typically the sensors are configured to send a minimum amount of data that is necessary to characterize what they're doing. So many bodily functions change slowly enough so that you don't have

to send a whole lot of data. You just have to do it regularly.

There are a few exceptions, like EKGs, the gait monitor and other things that have to accumulate the data in more, shall we say, a copious form.

>>RAY ZARDETTO: Uh-huh. Well, one megabyte per person per day is a lot of data.

>>BOB MILLER: It is.

>>RAY ZARDETTO: Yeah, it certainly is. And I'm wondering, and I'll throw this question, we're getting close to the end of our time here, but I'd be interested in the perspective of any or all of you, where you've seen how far, based on what the network can do, we see how far medicine and health care technology and other technologies have come in the last half century. What will we take for granted 50 years from now that maybe is not something we actually see in the network or as a capability today? What will we take for granted say in another half century?

>>JAY WILPON: I don't think anybody will notice the difference between devices and networks. I mean, I think people will just interact with their surroundings. Everything will be smart. Walls will be paper with microphones and sensors. You know, think of the -- look at the movie like Minority Report or things like that. I think it will be very different interaction.

>>AMANDA STENT: I think that going along with that, because you interact with people, you will interact with people virtually and in the real world seamlessly. People with disabilities will be

much more present everywhere and the disabilities will be much less visible. People will be able to interact on an equal basis.

>>BOB MILLER: And I think I would add will be buffered from all the data that these sensor clouds and other data collection tools effectively produce by analytics that allow us to be freed from being bothered by every little thing. Essentially, these analytics will help us, based on what we're interested in, to hear or see or react to only those things that are really important to us. So I think that will be very powerful.

Moreover, I think in the medical space, the amount of data that we're going to collect over time with huge populations is going to revolutionize what we know about human physiology and disease. You know, I think it's going to make our treatments more effective and it's going to teach us what's normal for us, as opposed to what's normal on a grand average basis.

>>JAY WILPON: And we're all looking for people to help work with us. That's why we're publishing our speech APIs if you go to AT&T research home page and look for assistive technologies you'll see videos and things of our stuff. And we're really looking for partners and people to work with like Bob said, to help us bring along where the network should go, where our technology should go, where everything should go.

>>RAY ZARDETTO: So if people want more information about this, what address should they look up again?

>>JAY WILPON: Well at least for the assistive technologies,

if they go to the ATT research home page, which is just research.att.com, and they can search for assistive technology and there will be a whole page there with some video demos and a little bit of a brief description and they could ping on Amanda and I through there.

>>RAY ZARDETTO: Very good.

>>BOB MILLER: And you'll also find medical articles that I've written.

>>RAY ZARDETTO: Great. All right. We're going to unfortunately have to end the discussion there. Our time is up. We could talk about this for a long time. It's fascinating and I think very, very important, but I want to thank Jay Wilpon, Amanda Stent and Bob Miller for joining us for this half of our program today. Excellent discussion and fascinating again. So thanks to all three of you. I appreciate you being with us.

>>BOB MILLER: Nice being with you.

>>RAY ZARDETTO: Thank you.

That's it for today's show. Please join me again next Wednesday at noon Eastern Time on VoiceAmerica's Business Network. I'm Ray Zardetto and this is Disabilities at Work Radio.

(Music playing.)

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