ANNOUNCER: Welcome to Stuff to Blow Your Mind, a production of iHeartRadio.

ROBERT LAMB: Hey, welcome to Stuff to Blow Your Mind. My name is Robert Lamb.

JOE MCCORMICK: ...And I'm Joe McCormick, and today we've got something a little bit different for you. Today's episode is part of an ongoing series that we're producing in partnership with IBM called Smart Talks. In each episode of Smart Talks, Robert and I are going to sit down for virtual chats with people using technologies developed by IBM to deal with the unique challenges the world is facing today.

ROBERT LAMB: In this episode, we'll be focusing on artificial intelligence, especially the use of natural language processing and virtual assistants powered by Watson. To explore this topic in depth, we're going to share two conversations we recorded with leaders at IBM. The first is Ritika Gunnar, who is vice president for IBM's data and AI expert labs and learning. And the second chat will be with Jay Bellissimo, who is IBM's general manager for the U.S. public and federal market.

JOE MCCORMICK: Ritika, thanks so much for joining us today. So, to start off, can you introduce yourself and talk a little bit about your role at IBM?

RITIKA GUNNAR: Yeah. Thanks Joe and Robert, this is a pleasure to be here. My name is Ritika Gunnar and I run an organization called data and AI expert labs and learning. And our whole mission is to be able to help clients be really understanding of what it means to adopt data and AI technologies, how we help them accelerate the use of data and AI across their organizations through the methodologies and through the skills and expertise that we have from working with thousands of clients so that as they're embarking on their AI journey, they know how to be able to do that quickly.

ROBERT LAMB: Excellent. Now in this episode, we're obviously going to be chatting quite a bit about AI. So, just to ground our listeners in the right place, can you define artificial intelligence for us and describe the sort of AI we'll be discussing here today?

RITIKA GUNNAR: Yeah, so artificial intelligence, many of us know the hype around it, but very simply, artificial intelligence is about teaching machines to interact and think and make decisions like humans will. So, it's around us every day when you look at how machines can actually see things like humans do, when they can speak. Many of us have those, consumer-type applications like Alexa, Google Home. They're even enterprise-type versions, which I'm going to talk about today with Watson and Watson Assistant, where you can have assistance either in the home or for commercial use, whether it's actually doing any types of areas where you can predict or optimize or automate some kind of working decisions using artificial intelligence.

ROBERT LAMB: Excellent. Now you mentioned Watson AI and Watson Assistant. Can you ground those two for us as well to tell us what exactly Watson AI is and, as much as is feasible at this point in the interview, what Watson Assistant is.

RITIKA GUNNAR: Sure. Watson AI is leveraging technologies for AI for most enterprises and their essential workloads. When you look at it, we've done thousands of AI projects, all across the world,
across almost every industry you can imagine and almost every country, and through that we've learned what it means for clients to truly put artificial intelligence in their most essential types of workloads. As part of that, we've developed Watson AI capabilities. Some of you may know the simple kind of APIs that are like vision, speech, natural language processing. But it's also more than that, and I'm going to talk about that in terms of the applications that we see many users leveraging AI in, accelerating how they're actually doing that. So, we're going to talk about things like Watson Assistant, what we have in terms of Watson capabilities for the financial services organizations or what we do to be able to apply AI to any kind of industry. We do that in a way where we can actually pre-package that application. We have Watson AI applications. Watson Assistant is one of those.

Think about this not just as a simple chatbot, but it really is about letting users have the ability to have an assistant that understands how to respond to questions that you've trained it on or that it has learned through data that it has seen previously on not just really simple questions, but really hard questions that may be sitting in documents that are buried inside your organization – whether that be, you know, your playbooks, whether that be your runbooks, that you have to be able to answer questions. It really is about answering not only the simple questions, but training AI to answer even on the most complex questions as well.

**JOE MCCORMICK:** So today we're going to be focusing a lot on how AI is being used in the current situation that we're facing in the world. Can you talk a bit, to ground the problem, about some of the ways that the COVID-19 pandemic is affecting how the public interacts with businesses and institutions?

**RITIKA GUNNAR:** Yeah. I'll give you a little bit of background. Three out of four users, when they have a problem, any problem, they want to be able to answer that problem on their own. That's why we use things like our phones, our web internets, our voice assistants that exist there. Three out of four people want to be able to find an answer without talking to someone and to be able to do it on their own. When you look those users, two out of three of them actually consume three or more channels. That's, you know, using your web, using your voice assistants, et cetera. So, there is a large demand for people to be able to find answers to questions on their own and to be able to do so in multiple mediums. Now, when we look at what that means on the backend today, we have multiple customer service agents that are answering a lot of those questions, and over 42% of those customer service agents don't have answers at hand.

And so that becomes quite frustrating for end users who really want answers at their fingertips. So, you know, the situation that we're embarking on is the use of more pre-trained kind of AI capabilities to be able to answer those questions. This pandemic that we have with COVID-19 is no different. I want you to think about the amount of uncertainty that's there in the world because of COVID-19. You know, a few months ago at the very beginning it was, “what are the symptoms of COVID-19?” “How do I tell whether my own child may have COVID-19?” And what was happening is, a lot of the call volumes that were coming into the hospitals and the government organizations were overwhelming the system such that doctors and nurses and public servants were spending a lot of time answering questions versus facing the pandemic itself.

And so we saw a huge surge in requests to be able to use AI-powered assistants, like Watson Assistant, to be able to answer those questions. And it has expanded from just, “help me understand what the symptoms are. Help me understand where I can go get tested,” to know other things that are downstream. Like, you know, “what are unemployment benefits for my state? How do I actually apply for a small business loan?” And so the demand in times that are so uncertain, especially when you look
at how every hospital, every county, every country has their own types of regulations or rules, AI becomes something that's really powerful, and that's what we've seen through this pandemic. We have an offer with Watson Assistant that we've put out there where we are making our technologies available for many of these organizations that are dealing with this pandemic.

And we are trying to put these technologies up usually in less than one day, not just with an assistant, but a voice integrated assistant – and do that to where our clients can get up and running in less than a day servicing their constituents, deflecting up to 90% of the call volumes that usually would come into a call center. And you have to realize that the call centers themselves have their employees working from home and are constrained themselves.

Let me go through a few examples that we've seen during this pandemic that I think that will relate to not only you, but to the audience. We have hundreds of assistants that are now live over 20 countries, and a lot of them are responding to real-time questions around COVID-19. I'll give you one example, which is my home state or my home city of Austin, Texas.

We have a Watson Assistant on their homepage for the city of Austin providing instant answers to their citizens about the COVID-19 situation in Austin, where people can go get tested, and the most up-to-date information there. Another example is the Children's Healthcare of Atlanta. If you think about it, parents are really worried about what it means for their children. Do their children actually have a lot of these symptoms? And if they do, where should they go to bring them in? We worked with the Children's Healthcare of Atlanta to be able to put not just any assistant, but a voice activated assistant, on their site within a weekend to be able to be up and running. As I mentioned, we're now up and live in over 20 countries. Some other examples are the Czech Ministry of Health launched a virtual assistant named Anežka to guide citizens on topics on the coronavirus according to policies that were set by their government.

And you know, in the first weekend what they found is that only 10% of chats required a handover to a live agent. Just think about that. That means 90% of questions were answered by this assistant. As I mentioned, like the first waves we really saw were in the public sector and in healthcare. But now we're seeing that it is pervasive across all of retail, financial services, industrial. We're seeing it across almost every industry because there is a spike in demand, you know, a lot of these started out as, as assistants for citizen communities. How do you let the public know what's happening? But thinking about some of the other use cases, some of the other ones are, as I mentioned, actual companies and organizations that need to service their customers because their landscape is changing. Or even companies that need to service their internal employees. When is it okay to come back to work? What are the regulations on coming back to work? How are you phasing it? And so, you need to be able to have these kinds of capabilities to respond to a lot of the uncertainty in these times. And AI definitely helps.

JOE MCCORMICK: So, I wonder, obviously a big thing when you're having say some kind of call routing program, an assistant that would be dealing with calls coming in. One thing is that has to be able to decide when somebody needs to speak to a human operator versus, you know, continuing through the call flow or whatever decision flow it naturally has. What goes into that kind of decision and how important is making that decision early on?

RITIKIA GUNNAR: Yeah, I actually, I think that's actually a great question. Think about what it means to train an assistant. You have to be able to first, when you ask a question, understand the intent of that question. So, when you're asking what are the symptoms of COVID-19, you have to be able to parse that sentence in natural language and really understand what is that intent, because that could mean
different things. If I said instead of what are the symptoms, where can I get tested for COVID-19, those are two separate intents. And so, we call those things intents. We have to train Watson Assistant on the types of intents to be able to answer and the answers to those can change over time. So, we talked about some regulations change naturally as these organizations actually change. And so, the first thing is having an understanding; do I understand the intent and with what probability do I understand the intent?

Majority of the time these intents are easily understood, and so if it's an intent that has been recognized we can answer that question if Watson has been trained on part of what are those answers. And so, we sometimes see that if you can recognize the intent, then underneath there you want to be able to answer those questions. If Watson has a probability within range of what the user accepts as reasonable, it will automatically respond. And if not, you can train Watson to then kick it back immediately to an actual physical person to be able to answer those questions.

JOE MCCORMICK: Oh, that's interesting. So, the uncertainty can be the cue that we need a human to intervene here.

RITIKA GUNNAR: If you think about it, AI is all about probabilities, right? What is the probability that the answer that you have is most likely the answer that the user is looking for? If that probability is high enough and in the tolerance range that you have, then you can actually give that as an answer.

JOE MCCORMICK: Yeah, that makes sense. So, to unpack the technology a little bit more. I think from the caller's point of view, I think we've all had these experiences where we know that in some cases automated menus can be very frustrating, right? Like I'm imagining calling customer service at a credit card company or an internet service provider. Obviously, we realize we're talking to a machine, and without a human operator we might worry that some important information we have is being ignored or some nuance of our case that we're trying to deal with doesn't fit within the automated routing stream.

So, what are the ways that properly designed AI assistance can help make automated call routing both more practically helpful to callers but also more emotionally reassuring?

RITIKA GUNNAR: There are many things that are happening in this space that I think are really exciting. Look, most of the time when you call into a company for customer service, when you get kind of the automated machines that are like press one, press two, those are very deterministic systems. Those are not using artificial intelligence. If you look at the real value of having an assistant like Watson Assistant, it's about being able to answer your questions when you want them as you want them, not in a pre-integrated workflow that you have with other deterministic systems. And that has a completely different experience because you can start in one part of a conversation, you can go multiple levels deep, you can then go start another thread. And because the way the AI components, as well as the logic, works you are speaking naturally, you are getting answers in a natural way and you are actually going between threads, multiple levels deep – that is engaging as you would as a human, and what you can do with Watson Assistant and what makes it such a beautiful experience comparative to what customer service experiences like when you have those deterministic voice capabilities.

ROBERT LAMB: Now, one of the aspects of calling and engaging with a human operator on the other side of the line is that this is generally, there is an expectation that they might be empathetic and give appropriate responses for say, delicate situations like unemployment claims or health fears. You know, and again, that may be the, the expectation if not the actual reality, but then how do you tackle that from an AI standpoint? How do you make sure that it is at least seeming to speak with empathy and give
those appropriate responses to someone who is in need?

RITIKA GUNNAR: You know, it’s part of understanding the intents that we have not only with Watson, but other parts of our portfolio, we can understand the tone and the sentiment of the user and so we can understand if that tone is positive, we can understand if the tone is that the end user is irritated or if they’re extremely angry. A lot of that can be understood not only by the words that the user may be typing into the screen, but by the way their tone is when they even speak. And because of that we can actually respond in similar ways where we have the right level of empathy to respond back with. In some cases where we find that, you know – suppose a user is extremely angry, we can pass them off immediately to a human and put that human in the loop. And that’s why, you know, when you think about artificial intelligence, I always think about it as an ingredient in the broader picture, and it actually is something that helps your overall application or your overall customer service experience and is human assisted– like, the human needs to be part of that loop at some point if, if there is an escalation.

So, understanding tone and sentiment is an extremely important thing, especially when you’re dealing with customer service. You know, we see that quite often. You want to understand, for example, if you have been billed double and you are extremely angry about it, that the assistant itself can take care of that with empathy. But perhaps it’s something that you want to pass to a human agent to be able to have a little bit more handholding in that particular situation. What we’ve actually found is when huge enterprises, when large enterprises get started with AI capabilities, they’ll actually start in a way where AI can also be used for their assistants. If you think about it, you want every assistant in your organization, every human assistant, to be able to give the same answer in the same way so that there’s no discrepancies on what the right answers are. So, we see assistants not only being used directly for the customer, but also for agents within organizations to have the same response to all types of questions coming in.

ROBERT LAMB: So when we, when we think about bias, we tend to think about human activities and, and human institutions. But of course, AI is a human creation is susceptible to bias as well. Can you explain how bias creeps in? And then how do we prevent AI systems from succumbing to these same errors?

RITIKA GUNNAR: If you think about it, bias exists everywhere in the world and the natural world today. You know, if you take a look at AI systems, AI systems are naturally trained by data. Data that has existed there in the world for decades, centuries. I’ll give an example: today, if I were to train an AI system on how to approve a loan for a particular person, and I use data from the past 50 years, more than likely you will see bias in the data for the last 50 years that where given everything equal, that men were more apt to be able to get a loan with all the same attributes than a female would. That is bias that exists in data that real people have approved loans over the past five decades. And that particular case, you know, if we train AI on that same data today, we would want to make sure we take that data and we remove that bias because that is a factor that we would want to say, okay, there’s bias that exists in the data that we have. We can see the bias and that’s a bias that I don’t want to be able to have.

Another example may be about claims and claims approvals for auto insurance based on age. We know as an example, if I take the last 50 years of data that claims that come in from younger generations are probably more prone to some sort of fraud than older generations. And that particular case you might have a higher fraud rate at ages 18 to 24 as an example. That may be a bias that you want to be able to keep in your system of approving or not approving claims because that is a reasonable bias to be able to have to say, I want to double check before we approve or not approve those types of claims. So, bias exists naturally in the data that we have.
And given that AI is only as good as the data that you train it on, you need to be able to take the algorithms that you create from AI. You need to be able to detect where that bias exists. And then in cases, like I mentioned, where you're talking about age and loans, you want to be able to remove that bias. And that is one of the most critical factors to making AI mainstream. Like I'm a firm believer that this is a decade for AI to go mainstream. And for it to be able to go mainstream means that organizations need to be able to have trust in AI and how that AI is working. And that's why being able to take any model and understand where the bias is in that particular model and then to be able to understand things like, how can I explain how that particular model made that decision? What are the factors that went in for AI to make a decision becomes extremely critical. So, the ability for organizations to make that AI mainstream is, can I detect bias? Can I remove it? Can I explain what AI is doing? And that's a lot of what our teams within IBM are working really hard at. A lot of the research technologies that we've had are now in our products and we're helping many organizations, large and small, be able to take the AI capabilities they have and to put explainability and bias detection and fairness recommendations into their AI components, because that's the only way we're going to get AI to scale.

JOE MCCORMICK: Yeah, I guess what I was wondering there is if, this is a case where like a diversity within the tech world actually has measurable effects on whether these types of bias end up making it through, you know, or go unnoticed in the design stage.

RITIKA GUNNAR: I think that's a good point. Look, diversity in technology and especially in artificial intelligence is critical. And that's diversity and all kinds of backgrounds. I would say from having diverse perspectives and diverse point of views help you create AI that is more beneficial for society and for the community. Let me give you a couple of interesting statistics. You know we have recently put a lot of focus on women and artificial intelligence. Today, it's estimated that less than 26% of AI professionals in the marketplace today are female. That's not where we want to be able to see, the representation of AI and females. Because as you have more diverse perspectives and points of view, you can create, better outcomes for users and better AI algorithms. And so, it's one of the reasons why IBM has put such a huge focus on women in AI. This year is the second year that we announced a Women in AI program, where we have celebrated over 30 females in AI professions and the journey that they have taken through their career.

We have a few goals in being able to do that. Let me first take a step back and tell you our effort in doing this was to really promote gender equality in AI and showcasing these over 30 leaders across a variety of industries – I think they're in like 12 countries – was really important to us to demonstrate not only the power of AI but the power of diversity in AI and the kinds of accomplishments that these organizations are doing and the technologies that they're implementing with Watson and other capabilities. So, what we have found is that by having and highlighting a lot of these females, we can interest other younger generations of women to be able to embark in this AI career.

This is especially touching for me and I think I'm a lot more active in the women in AI field being a computer scientist working on data science and data science products for a while as I have young children. And, my daughter who is nine years old, came to me one day after I sent her to a Python programming class and said, “I don't like it.” And when I sat down with her and really understood the thread of why don't you like the class that you're in, you know, it's a programming class where we're engineers at heart and it's one of the things that you have to do. She said, “I was the only girl, everyone was coding Minecraft mods and I really wasn't interested in that. I was sitting by myself”. And it was in that moment that I thought about, you know, people need to be able to see themselves in role models and that's why I think programs like Women in AI are so important because as we want more
diversity, people need to be able to see themselves very clearly in that. I'm pretty proud of some of the things that IBM has done to be able to put more women in AI, not only within our organization, but to be able to promote that with the thousands of clients that we work through in this second inaugural program that we have.

ROBERT LAMB: Now, when the COVID-19 pandemic ultimately subsides, what lasting impact do you hope to have with the work that you're doing right now?

RITIKA GUNNAR: You know, I'm so proud of our teams that have risen to the occasion of helping these hundreds of organizations implement AI capabilities during this time of crisis. If you look at it, it is helping answer some of the most pervasive questions across all of these organizations in an extremely timely manner. I think the changes that a lot of these organizations are embarking on are here to stay, and not only here to stay, but they're going to accelerate for every organization. Every organization is going to adopt technologies like AI, digital capabilities, a lot more quickly. And so a lot of the lasting effects are taking what we learned and helping organizations really scale out a lot more quickly the use of these AI technologies and having them be fundamental to how they operate and not just a sidecar.

ROBERT LAMB: Again, much appreciation to Ritika Gunnar for taking the time to speak with us for this episode. And now we're going to go straight into our second talk on the subject with Jay Bellissimo.

JOE MCCORMICK: All right, well Jay, we really appreciate you, uh, taking time to talk to us today. Can you start off by introducing yourself and telling us a little bit about your background?

JAY BELLISSIMO: Sure. Joe and Rob, it's great to have the opportunity to spend some time with you today. So, my current role at IBM is general manager of our federal and public business. Prior to this role, I spent six years focused on Watson and AI and cloud.

ROBERT LAMB: Excellent. So, on the, on this topic of AI, we will dive further in, in this interview and start chatting about these, about, Watson AI, Watson assistant, et cetera. But before we do that, would you mind just, like touching on some of the biggest misconceptions about AI itself so that our listeners are properly grounded in where we are with real-world AI?

JAY BELLISSIMO: Yeah, Rob, it's a great question. Again, I started as general manager in Watson business back in 2014 when it first started. And you know, there's always been a lot of talk about AI. AI algorithms have been around for many, many years. And I'm pretty excited because since 2014 I, think I've averaged about 200,000 miles a year, been to 36 countries, been evangelizing around AI and I couldn't be more excited. Unlike four or five years ago when people said, well, when's it going to happen? It's happening. It's not a question of whether or not it's going to happen. It's here today, whether it be every day, listening to Spotify or using Waze, I mean it's in our everyday lives and we've also seen this whole consumer market really blur the enterprise, companies and government organizations. So, where we are this year, I playfully say this is a year AI goes into production.

Just at IBM alone, we have over 20,000 projects globally in terms of AI use cases. And I think at the end, Rob and Joe, for me the difference is what's the problem you're trying to solve? Sometimes we get out ahead and companies will say, well, I must have AI, but practically it really comes back to AI is awesome and it can do so much, but you really have to have in mind what's the business problem you're trying to solve. And once you can really hone in on that, then it becomes a lot easier to look at it because in addition to AI, another big, big piece of this is the data. And you've heard so much about the data and access to the data, and that's one of the things we take a lot of pride with at IBM is typically that data is
the hospital's data or that data is a government agency's data, or it's a big industrial company's data, because that is really important because ultimately that's your IP.

Because when you think about it, very simply, when you think about AI, as you're starting with the data and working with AI, the data is going to create insights and insight creates knowledge. And with all that, Rob, coming back to your question, that's where I get really excited because in the end, this is really a partnership between man and machine. It's not man versus machine. And that's important because let's face it, there's so many menial tasks that can be automated, and that's no different if you look back over the industrial revolutions over the last hundred years. And so, really you can use this technology to do so much, but there's this misnomer that it’s displacing jobs, and that couldn't be further from the truth.

When you really think through how this can be applied, is it automating? Absolutely, but there's so many jobs that are being created that we need to make sure that we, not just our company, but any of the companies, academia, governments, we need to come together as stewards of this next generation of opportunities in all of these new jobs and make sure we usher it in together responsibly because, I'm not worried about the jobs. What I'm worried about, back to all the clients, I've been at hundreds and hundreds of clients over the last six years, it's how do I equip my workforce to stay current? And that's the part people really need to double click on and make sure that we're all responsibly making sure that everyone can transition into this new era with the required skills. And the last point is just on as we do this, there are still some challenges around ethics and bias. And that's something, again, everyone, academia, companies like IBM, we all need to continue to work together to make sure, again, we usher this in in a very responsible way.

JOE MCCORMICK: Maybe we should focus for a second on specifically what some of those challenges are. You mentioned of course ethics and bias. We can maybe circle back to that if we want. But, another thing that I saw, you mentioned, I watched part of a talk that you gave where you mentioned the idea of information architecture, that you know, that you can't have AI without IA. Could you talk a bit about that and what kind of challenges are still present there?

JAY BELLISIMO: Sure. Fundamentally, what we're saying with that statement is basically the data is going to be critical. And when you think about the data and what you do with the data, and you analyze - you collect the data, then you analyze it, you organize it, and then you infuse it with AI. That's really what we're saying is when you have AI, you really also need to have that information architecture because they go hand in hand. Because again, we've had the data, but we've never had the data at the levels we have. It's really outstripped humanity's ability to keep pace with it. So, with that, we have all this unstructured data. 80% of the world's data is unstructured. On top of that, only 20% of the data is accessed via the web. So, a lot of that data sits behind the corporate firewalls. And so, there's so much opportunity. So, in the end you've traditionally had information architecture. So even though it's this new way of AI, the, they really go hand in hand.

JOE MCCORMICK: So obviously today we were going to end up focusing a good bit on how AI is being used to respond in the wake of the COVID-19 pandemic. But first, just to establish what the needs are, what the problem is to begin with, can you talk about some of the ways that the current pandemic has affected how people interact with businesses and institutions?

JAY BELLISIMO: As you well know, I mean, none of us expected what we're living in right now. And the really cool thing is the way everyone's come together across the country. Recently, I had a call with the general manager of IBM Italy and IBM Spain and we were just comparing stories. IBM China, as an example, we were just exchanging over the last 60 days what we've all seen. And it's pretty powerful the
way everyone in the face of all this adversity has really come together. And what was interesting, a thread that we saw across all the different companies was we start with empathy. And as much as you know, we talk about business, this goes far beyond business, and this is really being empathetic. Every country is going through a different phase of this pandemic. But this common thread is just really listening, talking to clients, talking to government organizations, HHS, Health and Human Services, and others, and just really listening – what are those problems that we're trying to solve together across corporate boundaries.

And so, a great example I would use, I was personally involved with the Children's Healthcare of Atlanta. And I remember it was a Sunday and I’d spoken to the CIO and their issue, which is I think pretty common across a lot of the hospital and healthcare providers, is in their case their nurse station was being overwhelmed, understandably by concerned citizens. Maybe it's a parent calling about they’re worried about maybe their child has a fever or there could be other symptoms. So, they were just overwhelming the nurse station. So, within 48 hours from that first conversation with the CIO, we were able to stand up a Watson citizen engagement bot – a virtual agent as we like to call them and, and basically help them. So, when those calls came in, this virtual agent could take a lot of the questions and in a very natural way, very interactive way, engage with citizens who were concerned.

And the way we trained it is the hospital had specific protocols and a protocol would be, as an example, my child has a fever, what do I do? So, the protocol is just an encapsulation of all the different variations. So, in the end, it really is consistent with the hospital's procedures. Every hospital could be different with the protocols they run. The exciting thing is, the problem was that the nurses needed to spend more time with patients, as much as they wanted to, spend times consulting and using this technology to be able to interface with and being with the citizens as they called. And then at the right time, if a nurse or another medical professional needs to be engaged, then this citizen engagement bot can then help what we call our Watson Assistant for Citizens. What this can do now is now redirect it to a person as needed.

So, the beauty is it helps front end it and answer those questions. But, if they get to a point where they're not sure, then it hands it off to a person. And that would probably be again, a great example. And then another really good one that has come up with a lot of states that we're working with, like the State of Pennsylvania, is unemployment insurance. As you, Joe and Rob know, I mean some of these systems very public in some of the states like New Jersey, you know, the call for COBOL programmers or others where they're just overwhelmed. I think there are as many as 30 million unemployed over the last six months. I think the unemployment rate is around 4 to 5% right now. And so, again, using some of the same Watson Assistant for Citizens technology, we've been able to help states like Pennsylvania implement these types of solutions.

JOE MCCORMICK: So maybe could we imagine, walking through what one of these experiences might be like from the caller's point of view, because we all have experience with probably not AI powered, but more deterministic traditional call routing systems like when you call your credit card company or your internet provider or something and it can, we all know, be a kind of frustrating experience. How does an AI-powered experience differ from that? How, in what ways could it actually be more practically helpful and potentially more emotionally reassuring?

JAY BELLISIMO: Yeah, it's a very good question. And, ultimately, it's interesting and this is all about serving the people in the communities. Having said that, you know, some of the technology solutions are different, some are programmable chatbots and they're really light in terms of real intelligence of what they do. And in those cases, they can frustrate people calling into these. When you really factor in
machine learning as we do with our Watson technologies and solutions, again, it comes back to the four areas I talked about before. It’s understanding. There are nuances in language and how we communicate with each other. So, it understands the context of the words and the phrases. And to your point, Joe, these systems are probabilistic, not deterministic. And that's a game changer in my view. And that’s why we’re pretty excited about our Watson and our AI technologies because it really, to your point, it’s more empathetic. It engages genuinely with people, it understands the words they use and the language and they know how to respond. And then to that third point, they continuously learn, and they get smarter and smarter with every interaction. So, they’re not perfect, but every time you learn from past experiences, then it’s only going to get better and smarter and it will be more engaging with, with citizens or consumers depending on how you use the technology.

ROBERT LAMB: This is a fascinating thing to think about because, essentially, we’re talking about having a more human experience with the technology. Most of us probably have experience with the other model of automated machine technology when we call a credit card company or whatever the case may be. We feel ourselves just thrown into those brackets and it can feel dehumanizing, it can feel very frustrating. I wonder as we as a population begin to experience more and more of these AI models, I imagine people are going to go into them perhaps expecting that frustrating, sometimes dead ended situation, but instead they're going to encounter something that is reacting to them more that may even in these cases be exhibiting something like empathy. How do you see that shift going with us as a technology using culture? And then is there a potential that we overshoot then, and we start expecting more empathy than is possible from the machine?

JAY BELLISSIMO: Yeah, it's a great question, Rob. And the way I look it is anything you can do to meaningfully engage with citizens and consumers is a very good thing. We have different technologies with our Watson technology. We have personality insights and other types of capabilities that - it's trying to enrich that interaction. But at the end of the day, you know, every company will have their approach. And our approach has always been, again, man and machine. And we’re always trying to make sure we have the most meaningful engagement between man and machine. And to your exact point, the empathy, how are people feeling, the way they use certain words, what does that mean? Can we derive more insight from that data? And ultimately for us, the game changer is knowledge from the insight. And that’s when you really get into this, I think a much higher level of interaction. But you also govern that in terms of how far do you want to do go down that path.

So, an example just to extend this conversation. So, you have that engagement. It’s understanding, reasoning, learning, interacting with people in natural language ways. But now when you look at that, then you get into the point of, okay, so you've got this trust and you have this new way of engagement. You can interact by the use of words cause you're getting smarter. And again, systems like Watson never forget. And that’s the power, they get smarter and smarter. But then you extend it more and you say, okay, maybe, we could take an example. Let’s say, Rob, you and I are applying for a mortgage at a bank, and maybe you and I are interacting with one of these systems and, this is a fictitious example, but there are examples like this, but maybe you and I are interacting with a system, an AI system, not our system, just any system.

What if you and I check all the boxes, but in the end, you get approved, I get rejected. So, you can say, well, wait a minute, this doesn't feel right. I know he’s my friend and we have similar capabilities. So why? So, you get into this whole explainability of AI. You know what happened in those neural networks. You get into bias. How do I know Rob wasn’t biased against me for some odd reason? And so, you need to have explainability. And so again, we have some great capabilities in IBM, in our Watson solutions where we trace that. We can flag where there's potential issues with bias or explainability because we
want you to have that full traceability across end to end. And that's the other kind of evolution. So back to your original question, Rob, we absolutely want to enrich that experience. We want to learn from the words you use and tighten that communication and loyalty and trust. But with that trust becomes a big responsibility to make sure, a: you're protecting the data; you've got to be secure to the core in these systems. And then to extend it back to explainability, back to removing bias. A lot of that last part on bias is how are you training the systems? If you're putting in, let's say, nurses and doctors from data dump from last 30 years to today, you know, there's a great inequality with women and men, and we're all doing our part to make sure we can accelerate the turn or the pivot we need to make. But in that case, what if you pump into a system 30 years where it's been skewed, where nurses are typically women. And now you're feeding that data into some models, and these algorithms, and at the end of the day it might give a different result, but you might scratch your head and say, well, over the last five years, there's a lot more male nurses than there were 30 years ago.

So that's a point of, again, a responsibility. It’s so important to have that end-to-end process on how again, what's the problem you're trying to solve. And then as you go through that end to end, you've got the data, responsibly, you have to load the data, you have to understand the data, you have to protect the data. Again, that's IP, intellectual property. And then as you feed it into the models, you want to have that explainability, traceability and ultimately the ethics, which equate in large part to the bias. And so, you have that responsibility and at the end of the day, that's what IBM is very proud of. We have tools and capabilities to make sure that there's integrity throughout the whole end to end process.

**ROBERT LAMB:** So obviously the COVID-19 pandemic has, has forced companies, institutions to take up AI technology, to implement it, to just get through this time period. But what lasting changes do you see really sticking with us from this that are really going to benefit us in the long run?

**JAY BELLISSIMO:** Yeah, it's a great question, Rob. I don't think anyone has the exact answer. We are in a new norm and it's to be defined as we move forward. But when I look at a lot of the AI and other technologies, blockchain included, and I look at organizations that maybe are in a function, it could be a government organization, and let's say their remit is to make sure that critical supplies move across their supply chains. It could be, let's just say, ventilators. Instead of redirecting a hundred ventilators to Atlanta, maybe you redirect them to New York City. So, we know there's a lot of great technology out there that does that, but a lot of that beyond the predictive analytics, it's going to be situational awareness, that whole operational situational awareness. And so that's just an example of supply chain.

So right now, it's pertinent because it's COVID-19. But what if you put that solution in there and we are exploring some things with one of the organizations, and you have a short-term solution, but over the longer term, what if it's hurricanes, in this next chapter? You're going to be using a lot of these same technologies and potential solutions and you'll just iterate on these solutions. So, I don't view a lot of these solutions going back to the Children's Hospital of Atlanta. Yes, the immediate need is to be that Watson Assistant for Citizens. But over time, that could evolve to other areas where they want to use AI – back to my earlier point about scaling, in other use cases across your hospital or back to this organization. And then the only other point I would highlight is, again, there's a lot of great technology out there today around data and analytics and I view AI as very complementary.

But let's go back to hybrid cloud. And let's go back to Kubernetes and Red Hat and how all these things are coming together. These are game changing transformational solutions, and so beyond the COVID period here, the pandemic, there's going to be a lot more opportunity to continue to take those and go faster and further. And so my point being is when you look at coming back to the logistics, I'm going to shift gears just for a quick moment. Look at what we're doing around food safety with blockchain. We've
been partnering with Walmart and others around making sure that you've got better traceability across that whole supply chain because people get sick and some are definitely sick, some of these scenarios. So, if you can take blockchain and AI and cloud and put all these together to provide these solutions, this is there for the long term. And so again, we come back to point solutions, right now, in this immediate crisis, but I think a lot of these solutions live on, and I think they get better. I think they scale. And back to the point about maybe now it's worried about ventilators, tomorrow it could be worried about a hurricane disaster and moving other critical supplies across the U.S. or even globally.

ROBERT LAMB: You know, we cover a lot of inventions, on this show. We discuss, how different technologies emerge and how they're rolled out. And it really is fascinating to think about AI, and these examples that you've brought up already, and, just how different it is from other technologies. So many of these technologies have come out and, and they are instantly going to be used for our, our baser instincts. So, it is going to be misused in some fashion, because, you know, how ethical can an invention be for the most part when you're talking about some sort of, you know, basic energy technology. But with AI you're talking about the ethical use of the thing being rolled up in its development, in its actual existence.

JAY BELLISSIMO: That's exactly right. And again, as I said at the outset, I mean we all have a responsibility - IBM, competitors, governments, institutions. In that earlier example, Rob, when we were going through that fictitious example of you and I applying for a loan, what if I got kicked out, you got to prove, just think internal to that bank. They have to go through their own validation and due diligence to make sure it's clear. And then you might have on top of that regulators that will want to look at this. So, it does bear a lot of responsibility. But the point is we all have to usher this in, in a very responsible way.

And, I have the good fortune of sitting in part of our AI ethics board within IBM. And I can tell you we have great focus. We meet literally every week and we're always pushing ourselves to think about these types of things, whether it be facial detection or just the way we talked about some of the uses of this technology. We have to be very responsible and make sure that, again, we're working together and ultimately with the governments, every country is different, right? In Europe, you've seen a lot, uh, over the last year, especially with the GDPR and other types of requirements, you know, whether it be the cloud, the AI, data protection. So, every country is a little different. I learned a lot of that just being in countries, in Singapore and Japan and Thailand, and everyone does it differently. But regardless, the great thing about IBM from my perspective is that we're in all those countries and we're very active with the governments and we're very active with the companies. We're very active with academia like MIT and we're all working together to find out and explore what are those ways? Because as you know Rob and Joe, it's an evolution. There is no set answer. It's always changing, and this technology is only going to go faster and be better and we need to ensure everyone's on their toes, so to speak, because it's a big responsibility. Am I excited about AI? Super excited. It's a game changer, but only if we all make sure that we're developing it in a very responsible way and we're working together to make it happen.

ROBERT LAMB: All right, so there you have it. Thanks once more to Ritika Gunnar and Jay Bellissimo for taking time out of their day to chat with us here. And if you'd like to learn more about Watson Assistant, just go to ibm.com/watson/covid-response and you can also check out ibm.com/smarttalks for more information about the topics we're discussing here. And if you would like to listen to additional episodes of Stuff to Blow Your Mind, you can find us wherever you get your podcasts. We just ask that you rate, review and subscribe.

JOE MCCORMICK: Huge thanks. As always to our heroic audio producer, Seth Nicholas Johnson. If you would like to get in touch with us with feedback on this episode or any other to suggest a topic for the
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