If you work in a support organization, AI can improve processes, automate decision-making, automate tasks, behind the scenes tasks. And really the promise is to make their employees more efficient and the customers happier.

If I was to put the spotlight a little bit in the current business I'm involved, in life sciences [00:03:00] drug discovery is an issue, and AI is employed to solve this vital problem. So if you do drug discovery, you go through multiple stages.

It's very expensive, it's lengthy and it's risky. So if you think about the drug candidates and how many of those pass at a clinical trial stage, the success rate is as low as 10% to 15%. And that comes after a three to four year investment [00:03:30] and a significant amount of money that goes into this.

So if you're thinking about Innoplexus, the company that I work for at the moment, they have a purpose built AI platform that makes drug discovery more efficient and more effective. So it uses some machine learning-driven hypothesis. It generates, for example, potential biomarkers based on unbiased AI models that Innoplexus owns.

And these models are built with an [00:04:00] extensive network of biological validated data, and that data comes from both published and unpublished literature. And the outcome is it ensures that the models have this high

organizations, there's even a ton more than what we've talked about. But these are some of the encapsulations, or I'd say the low-hanging fruit we're seeing that are making a very, very tangible difference to companies nowadays.

Paul Thies: You bring up an interesting point. Obviously, with all the content and all the data that is generated around the world [00:08:30] and through organizations on a daily basis, it begs the question, Stratos. What do you think is the most pressing problem for organizations, in terms of AI development and using that data, the massive amounts of data that can be collected? How do organizations attack some problems that might arise with AI?

Stratos Davlos: Yeah. I was about to say data. Data availability, in fact data that's ready for AI [00:09:00] is one of the biggest stressors for companies. And the reality is you either have a lot of data, more than you can actually use, or you have no data or no permission to use the data you have.

And there's a known study showing that about 90% of the data in the world today were accumulated over the last two years. So if you have data, how can you make sure that you're actually gaining the insights you [00:09:30] need to lead your industry? And that's what companies are going through today.

They're saying, "Okay. How can I leverage the data I have? And then in order to do so, do I need to have access to data scientists or specialists?" And as you know, data scientists are a rare species.

So the other thing that causes a pressing problem is, "How many people do I need to hire, and do they have the right skills? And do they speak the same vocabulary like I do to understand how they're going to process the data [00:10:00] I own?"

Now owning the data is a liability, and you can get hacked. And you know the byproduct of that and the significant marketing hit that you're getting, plus all sorts of legal implications of that.

You may be infringing upon people's privacy, and you're at the mercy of audit and regulations, especially in Europe you see that. And if you end up having a sliver of data that you can use, [00:10:30] then you build models.

And once you have those models, the next level of anxiety is, "Okay. They produce some outcomes. How can I explain those? And when those outcomes are produced and I get sued as a result if I decline a loan because I'm using a machine learning model that was used from the data I have, how can I explain that to a customer or to a judge?"

Machine learning is also open and vulnerable on adversarial attacks [00:11:00] and all these things. So if you just put all of this together, data availability, ability to prepare data for AI, access to data scientists to build some advanced models.

And then once you have those models, do they do the right job? And can I pr

So Ginni Rometty, the CEO of IBM, actually calls this a new color of workforce. And it's not just data scientists that are going to get employed and reap the benefits of this new era. There's also any human can participate in this by doing crowdsourcing and labeling and generating data and validating, so to speak, whether AI is doing a good job.

It's not [00:17:00] going to take away our jobs, it's going to generate more jobs. The other thing is people really believe that AI is precise. And it's precise just like

work that, for instance, accounting or financial services or things that can be automated with algorithms.

But something that I found really interesting and Reuben, this hits [00:20:00] home for Jacobs, is that McKinsey Global Institute did a study on occupational shifts attributed to AI. And they found that AI will actually mean employment growth for engineers, architects, infrastructure workers, and others in similar positions.

And in fact, the numbers were really pretty startling. They're expecting an increase in those occupations by 35% in the US by 2030, [00:20:30] and with higher increases in Mexico at 48% and India at 117%.

So AI's not replacing jobs or AI's not replacing work for humans to do, but it's changing the nature of work. Let me ask you, Reuben, what are some of the issues that you are working to solve for and your team at Jacobs using AI and data analytics?

Reuben Maher: Yeah. This is a great question. We've been given a [00:21:00] lot of taskings from clients, a lot of projects from clients that they're wanting to take traditional issues they've had, whether it be manual data processing, whether it be trying to limit the amount of downtime of systems and machinery and factories and plants.

How can we take this data that they already have and make it more intelligent to drive insights, and then make better decisions quickly? A couple quick examples. In North America's hot desert in Arizona, [00:21:30] water's a vital resource. But the problem is it's extremely limited in supply.

So Jacobs, we've partnered with Pima County and we've delivered really a truly advanced water reclamation facility, which helps save taxpayers not only millions of dollars, but also augments their really, really precious and valuable water supplies.

So they had a challenge though. They had some of the aeration blowers that were failing and any time there's failure, that's downtime, and [00:22:00] the whole process of the water reclamation is impacted.

So how can we, using some of the data, predict, avoid failures in these aeration

So we also leveraged artific

What we found was by using this artificial intelligence capability, we were able to fast track our team's capability via automated tools instead of manual processes, to leverage artificial intelligence and to search and analyze these massive amounts of images faster and with higher fidelity.

It really resulted in higher accuracy rates, much more quickly trained models and greater object recognition. And this was a huge win for our NASA client. They've actually taken this out of proof [00:25:30] of concept and have funded it and moved it forward.

Paul Thies: That is amazing. Can you imagine the Apollo 11 team having to pore over a million images of the moon to be able to locate where they would put the Eagle down, for instance? It's really amazing.

Going back to the idea of we've got so much data and so much content out there now, it's almost impossible for humans, even a collection of humans, to be able to really efficiently [00:26:00] pore through that. That's where that idea of the magic of AI comes in as being able to do that.

Stratos, let me ask you. Reuben was sharing some of those amazing things that AI is able to do for Jacobs. What do you see where you were sitting with IBM, and then also where you're going with Innoplexus? What do you see as the most significant element of AI development in the next few years?

Stratos Davlos: Well, I'll tell you what surprises me with AI. [00:26:30] To date, we made a lot of progress in the field of AI. There's no doubt about it. In particular, if you look at the deep neural networks, the recurrent networks and some of the sophistication behind [inaudible 00:26:45] and others, there's a lot of innovation that goes into those. And there is a really passionate and enthusiastic talent pool that innovate every day.

The thing that surprises me that is the opposing forces [00:27:00] on AI. AI is vulnerable to attacks. So robustness is what we call for AI is a big issue. To my surprise, there's a concerted effort out there that's trying to manipulate outcomes at one time, in various forms.

So you can poison the training data. So if you use data out in the wild or the data a company collects has vulnerabilities [00:27:30] at the collection point, then you can manipulate the outcomes at runtime. So an adversary can do that.

They can also contaminate theaters and inject noise, either audio noise or visual noise, in a scene. So if you have a self-driving vehicle, the vehicle stops seeing pedestrians crossing the road by just inserting sticky notes on the scene that the vehicle sees.

What I'm saying right now to [00:28:00] you, if you had an AI system that transcribes it, somebody can play white noise that can confuse the transcription system to have a completely different outcome to what I'm saying.

So these are the things that caught me by surprise, and I got a lot more exposure to them while I was at IBM. And there is a big group at IBM that's actually looking around corners and trying to mitigate those [00:28:30] concerns.

Paul Thies: Yeah. And one of the things that I'm interested in is organizations and how they

Our last question here for today is for both of you. And Reuben, we'll start with you. And then Stratos, I'll ask you the same question. But Reuben, what would you say is the most surprising thing you've learned working in AI and NLP and data analytics and in this whole field? What's the most surprising thing you've

And when they showed it, it was really, really cool. So it uses machine learning to coach you, and then it delivers a report with tips and suggestions after you've been practicing. And it helps you deliver a more powerful presentation.

If you're reading too fast, it's going to recommend you slow down your pace. It also incorporates some kind of contextual understanding as well. So if you say, "Hey, you're the best man for the job," it'll inform you that this may actually be culturally insensitive [00:39:00] and instead recommend an alternate phrasing such as, "Hey, you're the best person for the job."

There are a lot [00:41:00] of models that today have moved from this narrow AI concept to more of a broad AI capability where they're multi-task, multi-domain distributed and explainable and multi-modal, and those models exist today.

So the ability to really analyze an image or look at a video and identify the most important scenes out of, let's say, a soccer game, these are models [00:41:30] that today... And to my surprise, are fairly robust. There are also models that are more towards what we call general AI.

These are these cross-domain systems that can learn and reason with broader autonomy. And some of those that I got exposed to are fascinating. So to me, it's amazing how quickly AI is evolving, and it's maybe one of the most impressive [00:42:00] and surprising elements that I've seen.

Paul Thies: Stratos and Reuben, I want to thank you both for joining me today and sharing concept to more of a bro4ET.00000912 0 612 792 ring me to g0 G[(do)7(m)4(ai)4(n)-21(s)5(ys)3(