Hans Albrecht
Hello, listeners. Thanks for tuning in to the Horizons Generation ETFs podcast series. We're really thrilled to have Cameron Schuler, Chief Commercialization Officer, VP, Industry Innovation, from the Vector Institute, here in Toronto. So, Cameron, thanks so much for taking the time today to meet with us. It seems like Toronto, and I don't want to leave any other cities out, but it seems to be becoming more and more of a hotbed for A.I. So, tell us a little bit about Vector Institute and how you guys play a part in all that.

Cameron Schuler
Thank you. And thank you for inviting me here today. I'm grateful to be here. So, if you take a look at the current resurgence in A.I., it really is... it has its origins here in Toronto, with Jeff Hinton and some of his students. And so, it's a field that's had lots of ups and downs, that's has gone through a number of winters. And I started in the A.I. domain in a winter, and not just... I mean, it was actually a summer, but A.I. winter. And it was thought to be an area that had zero commercial interest, and it really wasn't something that was going to add value. And you fast forward... Jeff actually said 2009 is when they made a lot of the big advances, but it really became known in 2012, so since the origins were here, at the University of Toronto, that's really why a lot of things have happened here. And there's a bunch of other pieces in the ecosystem, as well.

Hans Albrecht
Of course, the concept of A.I. really isn't that new. We've been talking about it for the past 50 or 60 years, and as you alluded to, there have been periods of these A.I. winters, where perhaps technology hasn't quite kept up with these lofty expectations for it. So, almost by definition, artificial intelligence carries that kind of lofty promise. So, how is this time different?

Cameron Schuler
Yeah, it's kind of interesting because I... You worry about going into another A.I. winter, right? Especially being in the domain because you know, that's your bread and butter, what you do on a daily basis. And what's really different is... So, what's being used today was developed back in the 80s, but what was missing is the data and the computing power. And those were the two things that have really changed. So, last winter happened, kind of, late 80s, early 90s, they were trying to develop expert systems. So, an example of that would be, I would sit down with you and say, "How do you run your portfolio and how do you make your decisions?" You would tell me how that works, which you may or may not be able to, and then I would try to build the system.

Cameron Schuler
So, as it turns out, experts, in a lot of cases, can't tell you how they do their job. And so, the systems weren't able to do that. So, that was kind of what caused the last winter, and it was really long, and it was long enough, almost everyone got out of the field. The joke is, you could go by first name globally, but it actually isn't a joke. If it was Jeff, it was Jeff Hinton, if it was Yoshua, it's Yoshua, right? If it was any number of the big names, it really was first name. You knew who they were talking about. And so, what's really different this time is the volume of data and that the largest companies in the world, a core of what their products are running on right now is A.I., so that's where we're really seeing the transformation. If it was still just startups, and big companies weren't adopting it, we'd probably go back into another A.I. winter.

Hans Albrecht
So, this data... sometimes we hear this statistic thrown about, that 90% of the world's data has been created in the last few years. I imagine a lot of that is due to social media, internet, not just adoption, but usage, right? We have these phones in our pockets, and we're not afraid to use them. We're very social creatures, but... I kind of joke that we're social creatures even in private, we're constantly posting things and pictures and all that. Is that the big difference? I mean, in the old days, when you needed data, I mean, surveys... you had to go to a lot of effort, survey, a poll, to generate a decent size amount of data to work with. Is it just that it's everywhere now and companies are starting to realize that this proliferation of data is now giving them this power to find different ways to monetize the data?

Cameron Schuler
So, a couple of things. So, one is that yeah, there's a lot more data out there. But, you think about inferences. So, Google knows more about you than you do yourself, by the types of things you search for, right? So, it's the inference, it isn't necessarily the search terms you use, it's collectively, what does that look like in building a profile on you? And so, some of those things are interesting, so it's kind of that systemic capture of data that is pretty key, at this point in time. So, the ability to take it and use it. A lot of what's happening, or pretty much everything that's happening, is supervised learning. So, you have a data set you can train on, you build your model out of that. And then, what happens from there, is when new data goes in, it's actually able to categorize and cluster it or whatever methodology you're using at that point in time. And so yeah, definitely that systemic business that is data.

Cameron Schuler
But, I think, if you're taking a look at it, it still is in the nascent stages. So, think about your phone. My phone at home does not sit where I am. So again, I can take an example of taking one of my kids to the car show, and when my wife said, "How was it?" He said it was really weird, he just wanted to take a look at Cadillac. She gets ads for Cadillacs, for the next week, right? And so, it's that sort of stuff that... it's getting there, but I think the cool things will be less about trying to sell you things, more about how we live and making technology and extension of us.

Hans Albrecht
Yeah. I wonder if the appeal in it, is the latest gadget, and I'm into gadgets, so I always have the latest stuff. It doesn't always work very well. My wife always talks about, "Why do you bother with these things? They work half the time." I hope that things like 5G improve the reliability of some of these devices, but I wonder if it's just sort of that idea of making life easier, that A.I. really captures. This sort of promise that more of the things we do on a daily basis, will get easier and be done for us, in a sense, over time. Do you see companies kind of focusing on devices, or is it software, or is it... Where are the areas where you're seeing A.I. benefit, sort of, larger swaths of consumers or potential users out there, in terms of profound ways to change people's lives or to make their lives easier?

Cameron Schuler
Yeah, so hardware is hard because you have to get people to use it, right? So, there's some sort of sale. And so, to me, the... Again, there'll be companies that will continue to do that, but you see the fortunes of them rise and fall fairly quickly, with things like Moore's law, all those sorts of things. And so, the best example I can use is, a company... I think it was probably about three years ago now, which was the first medical device to get through the FDA, and it's a much longer story, but it was A.I.-based. And really, what it was, a cardiologist could sit down and spend about 75 minutes interpreting a particular type of image or imaging, or the system could do it within 15 minutes, and now the doc has another hour to spend with the patient.

Hans Albrecht
Okay.

Cameron Schuler
So, those are the things that I think are really interesting, A.I. should make humanity better, and it should make it far more consistent. It should take some of the stuff that systems can do well, so keeping in mind that doing well part, and making us better. So really, things being truly an extension of what we do and how we operate. So, a computer forces you to work with it, how it works. So, for example, I have my computer in front of me that I write on with a pen. I don't type as well as I write, even though I can type really fast. But, just for thought process, I'm way better with a pen. It's probably the era we grew up in, but... so again, the more that's an extension of me, the better off I am, I think.

Hans Albrecht
It does seem like this theme, it's an age old theme that technology, some of what it does, is free up resources to do more value added, more potentially valuable things. I mean, going back to Henry Ford's production line, I mean, you're able to suddenly be more efficient. The computer, for example, keeping track of data and inventory and basic clerical-type jobs, the computer took care of that. And so now, these resources, these people who spend time on these things, are now able to do things that have a higher value add to them. To your point, a doctor being able to... and particularly in Canada, there's some studies that show that we don't have enough doctors. We're actually near the low end of the list on 33 countries, I think it is, OECD countries, in terms of doctors per a thousand people. So, we don't have enough doctors to begin with, so this idea that technology can free up resources and enable doctors to accomplish more, really could benefit a country like Canada. And in particular, the ramifications for longevity of careers and things like that, doctors not getting burned out. I mean, is this really a different kind of technology, freeing up resources to spend elsewhere?

Cameron Schuler
So, I think technology, as you pointed out, has done that for a long time. So, when you think about, arbitrarily, let's say anything over 2% GDP growth, as inflation. I don't care what the number is, but maybe now, you're in a position where 3% isn't. Because you can do more with less. So, a couple of examples. So, one would be, if you think about steno pools, right? So, before my time, before your time, but there were steno pools of women that would sit there and type stuff out. Then, all of a sudden, you sit there and say, "We actually don't need those anymore." Did those people become unemployed? No, they actually ended up in higher value jobs, and you take a look at how the world's changed over time. So, arguably, it's made it better.

Cameron Schuler
So, I think technology, in general, has made those advances. Humans are always uncomfortable with, or afraid of anything that could be a threat, somewhere in that reptilian brain or the monkey brain, somewhere there. But, I think in looking at this, that it's that human augmentation aspect. So, McKinsey came out with a number that, in the last 30 years, a third of the jobs that exist today did not exist before. So, all of us that work, do it differently than we used to. And again, we use the old Dow Jones Telerate terminals. So, the dummy terminal, it was an amber screen, using that and then all of a sudden, you're like, "Hey I got a PC, I can do more." So, things change over time, it's kind of cool to see that.

Hans Albrecht
Yeah, that is... and to that point about jobs, there's this narrative that automation is going to take all our jobs away. And on the one hand, I feel that at the low-skilled level, perhaps that's true to some extent, but as you say, people are going to reinvent themselves. There are going to be jobs in areas that we haven't even thought of yet, due to some of these innovations and advances that we're seeing. There was an interview I saw recently, with the CEO of IBM, and this was kind of a nice counter to the job narrative. She was talking about how they've implemented this A.I. into their HR, into their hiring practices, and the A.I. is actually identifying skillsets in a very precise way and placing people within the firm- people, perhaps in other areas of the firm, but even outside the firm- placing people within the firm, with very high accuracy, based on their history and all these data points. We're talking about data again, their history, their previous work, their skillsets. And it's able to do so, sometimes disregarding any qualifications, degrees because it knows that this person is going to be very good in this position. And as a result, the turnover in these placements is actually a lot lower than has been traditionally.

Hans Albrecht
So, the A.I., of course automation may have an effect on jobs in certain areas of the world, certainly, but we're seeing that A.I. is actually becoming useful, in a way, to more effectively find people jobs, and I think that's a very promising part of what you're saying and kind of speaks to your point that hey, technology is going to create jobs in ways that maybe we haven't thought about.

Cameron Schuler
Yeah. So, if we look at how automation has displaced people... so, go back to an agrarian society, right? So, you don't have to go back far in my life, that we're farmers. And that changed over, kind of, a generation. Germany is a really good example of... in 2004, it had one of the highest unemployment rates in the world. But, if you look at it now, it's somewhere around the fourth largest economy, second or third most automated economy in the world, but they have the lowest unemployment in Europe. So again, they've learned how to leverage that. So, going back to my point about GDP, you're doing more with less. So, you can get way more leverage off of it, which was pretty important. I think, in terms of just making a real change to humanity, I still think it's way more exciting than threatening, in a lot of ways.

Hans Albrecht
Right. So, we have to go forward with a certain sense of optimism, not head in the sand, but certainly optimism, and look at the trends over the last hundred years and realize that we are, as humans, we are quite amazing, in terms of what we can accomplish. And we are going to come up with new areas of needs in the area of jobs.

Cameron Schuler
Well, so, the narrative that the U.S. has lost 7 million manufacturing jobs since the 60s is true, but it's been replaced. So, there's... you lost 7 million, but you replaced it with 56 million and a lot of those in healthcare. So, greater than half of those pay better than what they would've made in manufacturing. So, that narrative exists, just people don't always like to look at that side of it. And so again, when you think about the advancement of healthcare, what was it a hundred years ago, you and I would be very, very old? Relative to how long people lived.

Hans Albrecht
Right. Exactly.

Cameron Schuler
And now, it's like, hey, yeah, I got decades ahead. So, that sort of stuff, to me, is exciting.

Hans Albrecht
Yeah, it's absolutely incredible. Well, I want to thank you, Cameron, for spending some time with us today, it was very enlightening, and hope to have you back sometime soon, to talk more about things... things are happening so quickly, it seems like there's always something to talk about, so thanks very much for coming.

Cameron Schuler
Oh, thank you very much, and I'm grateful that you provided the opportunity. I'm happy to come back.

Hans Albrecht
Great, thank you.

Cameron Schuler
Thanks.

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