

The Chatbot Phenomenon

Disruptive Forces in Investing

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Anu Rajakumar: Artificial Intelligence or AI has existed for decades in the pursuit of enhancing our everyday lives, but the last decade has held some of the most advanced iterations we've seen yet with a new wave of digital assistance and most recently chatbots. From ChatGPT to Midjourney and others, AI innovation is rapidly evolving and moving ever closer to creating an almost human-like model. Many are wondering what these disruptive AI technologies truly are capable of and to what extent might they completely disrupt various industries around the world.

My name is Anu Rajakumar and to discuss the future of asset management against a backdrop of disruptive technology, I'm thrilled to welcome to the show CJ Jaskoll, Neuberger Berman's Head of Investment and Data Technologies. CJ, thank you for joining me today.

CJ Jaskoll: Thanks, Anu. Great to be here.

Anu: So, CJ, to start off our conversation, why don't you provide us with some background on what these Artificial Intelligence innovations are and what other similar technologies can do, as well as what some of the potential impacts might be.

CJ: Sure. As you mentioned in your opening, Artificial Intelligence has been around for decades, but most recently a chatbot called ChatGPT, has really become a global sensation, practically overnight. Developed by OpenAI. This is a Large Language Model, an LLM, which has been released in the public in November of last year. It's achieved unprecedented adoption, reaching 1 million users in only five days, beating all other technologies that we've seen, and now averaging over a hundred million users per month.

Trained on internet size data with over 300 billion tokens and 175 billion parameters. It's one of the broadest, if not the broadest language model we've seen made available to the public. You can think of a parameter as roughly the synapse of a brain. So as researchers like to say that 175 billion parameters is like the brain of a hedgehog if you've ever heard that. And 1 trillion is the equivalent of a squirrel. So we still have a lot of ways to go till we get to Artificial Intelligence, but that just gives you a sense for how complex these models are separately and independently. Midjourney is part of a class of AI programs that can generate images from text, allowing anyone to create unique pieces of art with only a few simple keystrokes, could become your own Picasso overnight maybe.

These are both examples of an emerging category of Artificial Intelligence called generative AI, as you said. So why all the hype? This has gone from theoretical to practical really overnight in a very small amount of time. This shows us how human-like these tools could actually be. For ChatGPT, a great user experience is what's changed. That's the chat part of ChatGPT. These human-like conversations are impressive or scary depending on who you ask.

And according to some, this is even past the touring tests, which is one of our oldest measures of Artificial Intelligence. For Midjourney, the creative aspect is what's impressive. If you can imagine something that has never existed before, an MIT research paper said an avocado armchair, you could visualize it in seconds. This is already sent shockwaves through the creative sector where online communities have banned AI-driven art, which is interesting to think about.

Anu: I love the avocado armchair example, which I also checked out myself 'cause I wasn't familiar with it beforehand. For those who are less familiar, you know, it's an example of a computer model being able to combine multiple and sometimes like bizarre or surreal concepts, which are given in a text form, to create brand new images. Which again, for a human to draw an avocado armchair, we'd probably be able to do it. But it just shows you how well Artificial Intelligence knows the human world or understands it.

CJ: Yeah, and it's been trained on human art. So it's been trained on a picture of an avocado and a picture of an armchair. So it doesn't know what an avocado armchair is, but it knows how to put it together. I think about when cameras came out and people started producing art with cameras, a similar debate was happening.

Well, is that art? You didn't do anything. You just press a button, or even if you're a successful photographer you don't even press the button. You have your assistant press the button. So is that art? So I think the thing that's interesting to me is this overlap, or the synergies between the creative aspects and the chat aspects which are using slightly different technologies, but are all focusing on similar challenges from society or from the workplace.

Anu: Yeah. But as you said, to be clear people have always asked, "Are we pushing that boundary of whether something is really unique or creative or not?" I will give a couple of other examples of ChatGPT that we had just done internally at Neuberger, but someone had asked, write five reasons why Neuberger Berman's culture is special in the style of Quentin Tarantino. And then same question, but in the style of a Gen Z social influencer. And that response began and I quote, "Hey, y'all, it's your favorite Gen Z social influencer here." [chuckles] Uh, which I thought was really funny. And then we asked now can you limit that text to 200 words? And again, the ChatGPT within seconds able to produce responses. So for those who are listening, who have not played around with ChatGPT, the possibilities are truly quite endless.

You sort of alluded to this, but technological innovations like these they can evoke so many emotions in people. Whether it's excitement, intrigue, mystery, fear. One of the immediate concerns that folks have with any new technology, including ChatGPT is, will this affect jobs? Will it affect my job? Should I be worried? How do you think about that?

CJ: Personally, I'm not worried, either for myself nor for anyone who's listening. I think this will likely prove to be yet another example of man plus machine, not man versus machine. For those that figure out how to embrace it, and who don't come from a place of despair or doom, they'll likely perform the best. A couple of things to keep in mind. Number one, these large language models require many humans to build, label, and train them which has created many jobs along the way.

I also think about the outcome of the AlphaGo project as well as the deep learning and medical imaging project. Both of these are examples where we assume machine would win, but in the end, it was man plus machine that excelled. And that was surprising to the researchers who were running those programs. This tells us just generally, we don't know as much as we think we do about AI and how it's going to evolve.

It's also important to note broadly there's two main types of AI. Narrow or weak AI and general or strong AI. Every example that we've seen so far is really narrow AI. These are systems that are designed to perform a specific task, create an image or chat with someone. And they've all been well-defined and trained and advanced. The scary AI that you see in sci-fi movies is the general AI or the strong AI which we don't have any examples of, and no one could really predict when that will come. So while many predict overall that the AI revolution, which we're arguably in the middle of, will be on the scale of an industrial revolution, these technologies specifically are not here to steal your job, not if you're listening to this podcast.

Anu: Right, perfect, that will hopefully provide some relief to some of the listeners here. Maybe CJ, could you provide some examples of how you think some of these innovations like generative AI, ChatGPT, et cetera, how could they be leveraged in corporate America?

CJ: I think this will be segmented by industry. And for most, this will be evolutionary not revolutionary, like what we were just saying. For industries where you have many junior analysts reading and summarizing large volumes of data, like law, we will see disruption happening quicker and arguably we already are.

For others, the changes will be more subtle where your search engine will get smarter. Your grammar checker will be better. Your Excel plugin will become more thorough. Your personal home assistant will become more self-aware. And then eventually your industry-specific toolkit, whatever you're using right now at work, will do the same. One of the things to pay attention to is the technologies that are integrated and focused on the user experience will perform the best. Those are the ones we don't actually know we're using right now because we've been using them for so many years. And those are the ones that over even the last couple of months have impressed us.

Anu: That's very helpful. Specifically as it pertains to asset management, where do you think the technology is going?

CJ: For our industry. Eventually, every department will be impacted though, as we just said, those that read or write large volumes of techs could come first. The keys to success will be how these specific tools embrace and understand our people and our culture. And the reason I say that is because through any innovation in the last few decades, the technologies that have done that have performed well. A few areas that I would like to focus on is computer engineering, research management, and wealth advisory, all have which proven the ability to innovate over time.

We all know that true innovation must add some value or efficiency, can't just be a parlor trick. It actually has to do something to help us. AI will allow us to spend time on what's important in each of these roles. For computer engineering, coding assistance have already acclaimed up to 50% increase in efficiency and a significant reduction of key person risk. These are tools that can help draft the first version of your code and test the code that you have just written.

Think a cliff note for coders. For research management, imagine a tool that could summarize and extract insight from company filings, Ks and Qs, for example. If you add on sentiment analysis, legal entity mapping, advanced search, this will all become more accessible, allowing analysts to spend more time on where they add value or true business insight.

Similar techniques could help data aggregation challenges we have in the private markets. For wealth advisors, an internal chatbot could make gathering cross-asset or cross-business insight easier and more timely, allowing us to cross-sell products easier to the public. It's important to know for all these examples, as they become more mature, they will also become commoditized, which will force each individual to innovate and figure out other ways to add value. That's what happens in any form of innovation we've seen.

Anu: Yep, totally. No, it's very exciting and at this time we don't have plugins to different softwares, you know, at this time, like ChatGPT doesn't necessarily link up to Bloomberg or other proprietary systems, but when it does there'll be even more access to different information. Summarize the top 10 holdings in my portfolio that perform well during drawdown periods, you know, whatever it might be. So I think that, if you have any thoughts on how this will evolve to include other agents.

CJ: That's a great example. Think about, you know, every investor has a Bloomberg terminal or a competitor on their desktop. Getting information though and combining information is what's time-consuming and/or difficult. A lot of people spend time on that, just data cleansing, data organization, data aggregation. How they wake their model or the insight that they produce is proprietary, is unique, that will remain unique.

But the time that it takes to find the data that you're looking for, either 'cause you have a client on the phone or because you're trying to answer the question internally, will be reduced. And the time that you spend on adding that insight and then that value will hopefully increase. Data providers, financial services providers are obviously very interested in using this technology to help them.

Anu: Absolutely. Now CJ, along with all the incredible and exciting opportunities that we may see ahead, there are likely also some dangers as well. What are some of your biggest concerns with these technologies?

CJ: First and foremost, these tools are still prone to misinformation, so-called hallucinations. There are plenty of examples out there. You could find them easily, but they all have the same basic problem, which is the chatbot was wrong and really wrong. In other examples, the chatbot was convinced it was wrong, even if it was right, which is scary. Another clear concern we've seen, especially with the GPT model is the limited data set. The model has only been trained to 2021. So if you're looking for contemporary information, who's the president of a country? Where's the market? Who won the soccer game? You won't find any of that.

Lastly privacy and copyright concerns are real. These tools can record your input even if you put in a proprietary business secret. Because of that, many firms are banning ChatGPT until they determine the appropriate policy and control for these types of tools. Regulation will definitely evolve to handle the copyright claims made against all these different systems. Again, they're training themselves based on other people's art or text, and that's how they're learning.

Anu: Those are some good points. All right CJ, so putting this all together, share with us, what is your view on the outlook going forward? Where do you see AI and these technologies going, broadly as well as for the asset management industry?

CJ: I'm optimistic as you probably can tell. One thing to note is we don't actually know how this will progress. And Sam Altman who's the CEO of OpenAI, he pointed this out recently. We had predicted a few years ago that AI would first come for our blue-collar jobs, then our low skilled white-collar jobs, then our high skilled white-collar jobs, and then eventually our creative jobs. What actually has happened is almost the opposite and back to Midjourney now, this is where the creative jobs have potentially been challenged with these generative AI technologies.

Generally, we do know that smarter more up-to-date and more advanced versions of ChatGPT and Midjourney will arrive as will clones from the other technology leaders. Search engines and everyday office software will incorporate these narrow AI

technologies into their existing products. They probably already have. We should take the time to understand how these tools work and appreciate those use cases. For specific industries like ours, I can see us creating highly verticalized solutions.

Those are fine-tune models that meet our language data or creative needs and released in a way that alleviate any privacy concerns. So think about ChatGPT for asset management, or as you said, maybe ChatGPT for Bloomberg terminals, right? That could happen very easily. All of this will arrive as the marginal cost of technology trends towards zero, creating more opportunity and innovation. And we've seen this in the last decade as the cost of compute using the cloud has been reduced. The accessibility of these large models, and generally AI and machine learning, has increased as everyone's become more accessible to get to these tools. To summarize, and I heard this recently, AI won't replace people. People that utilize AI will replace people that do not. And this I think is the best quote to summarize where we are right now.

Anu: As you were beginning your comments there, I was thinking about the Disney movie *WALL-E*, where humans basically become large blobs that don't do anything and robots or other technologies do everything for you. But it sounds like you don't think that's the future for humankind hopefully?

CJ: No I don't think that that's in store at least not in our lifetime.

Anu: All right, sounds good. CJ I can't let you go without asking you a quick bonus question. You are a technology professional immersed in all kinds of innovations every day, but my question for you is, what is your favorite thing to do outside of the office that is not at all technology related?

CJ: My hobby, maybe my suburban midlife crisis hobby, is baking bread. And Jonathan Bailey actually told me one day that baking and cooking are not alike and baking is very structured and requires you to measure and be precise. And cooking is more about passion and there's science behind it, but it's different. You could replace things, in baking you can't. Baking also requires a lot of patience. Like you could bake something and you could wait 48 hours for it to be done and that's intriguing to me and something I enjoy.

Anu: All right. Anything in particular that you have made recently or that you're particularly proud of?

CJ: Well, there is a sourdough email list that you could become part of.

Anu: I would like to, yes.

CJ: Yeah. Yeah, definitely

Anu: It sounds very nice. Yes, please.

CJ: Yeah. You'll become part of. And uh pizza's the new sourdough.

Anu: Oh, really?

CJ: A lot of people say, yeah. A lot of people are saying that.

Anu: All right. Well, thank you very much for sharing that CJ, I definitely want to get on the Sourdough Society listserv, so please add me to that when you get back to your desk. And just in general, thank you for being on the show today. It's so enlightening to hear about this extremely hot topic from you. It sounds like the main takeaway here is that we should feel compelled to embrace and not necessarily fight these chatbots in order to enhance the work that we do and really hopefully, have an even deeper human connection to the clients that we serve. CJ it's been a pleasure having you on. Thank you for joining us.

CJ: Thanks for having me.

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