Pathways to the Future: Polen Perspectives on GenAI, Part 1

Dan Davidowitz and Steve Atkins of Polen's Large Company Growth team join Zhang Zhang, Head of AI and Risk Analytics, for a wide-ranging discussion on the technology and investment implications of generative AI.

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Q: Artificial Intelligence (AI) has been around for a long time. In many senses, it's not a new technology, but it seems to be more central to our everyday lives following the launch of ChatGPT. What do you make of this evolution?

A: AI has gone through many cycles over the years, as people almost forget about the term and then rediscover it! There's always something of a hype cycle with lots of talk and excitement. Next, there's a longer period when we try to assess how valuable it is. We've seen this before in data science with analytical machine learning and analytical AI. These models started out with a lot of promise in the 1960s and 1970s, and then they hit a brick wall since computing technology simply wasn't there to support the more ambitious cases. It took a few more decades before we started seeing it show up in more mundane ways. These include weather prediction systems, product recommendation systems, and tools for people to extract more value out of data.

The funny part is that people essentially stop referring to it as AI. Nobody buys a product from Amazon[1] and says, "Wow, the 'AI system' helped me find an extension cord that I didn't know I needed!" The same goes for the weather. No one says, "The AI helped me dress for work today." It's woven into everything that we do.

What's happening now is that we've hit a point where the underlying hardware is simply powerful enough to handle relationships between words. That's pretty phenomenal. Before, we associated computers purely with numbers. The simplest "dollar-store" calculators handle a handful of simple operations on 10 digits. Human languages have tens of thousands of words. To capture the relationships between those words, you need billions of relationships. In fact, hundreds of billions, if not little trillions, for the largest generative AI language models today. They're trying to capture behaviors of human thought, and a lot of human thought happens through language.

This has expanded the frontier of what we thought was possible. The margin cost is shrinking and tasks we might have dismissed previously as "boiling the ocean" can now be set up rather easily. As models expand into what we call multimodal systems, where they get vision, sound, and other input and output capabilities, that grows even more.

Q. How did this vast leap in capabilities come about?

A: To understand how we got here, you must look back about 10 or 15 years. That's when machine learning research really started taking off and hit this period of hypergrowth. That happened because of the surge in the underlying supply to run and train these models—the computation power, memory, and hardware.

All of this was subject to an observation from Gordon Moore, one of the co-founders of Intel. The observation, which we call "Moore's Law," was that essentially every two years, the number of transistors on a chip doubles, which is phenomenal. That's exponential growth. That means every two years, you have created as much computational power as all human society has created in all of history up to that point. That growth is what all AI research is built upon. It's what is enabling all these emergent new technologies and frameworks.

Q: How is the team thinking about these dynamics from an investment perspective?

A: It's true that AI has existed for a long time and is often taken for granted. Besides Amazon, I think another great example is how Visa and MasterCard have been able to process tens of thousands of transactions per second with very low fraud and abuse.[2] The reason why we don't have to sign receipts anymore, for the most part, is because of AI. There are many use cases that have just been part of a business, but many people simply didn't realize it.

There's an important distinction though between whether something is an interesting use case and whether it can be monetized. I think we're seeing a lot of that right now, and people are trying to parse what's valuable from generative AI and what's not. What represents meaningful growth for a business versus just incremental improvements? I think we're still figuring that out.

Q: With respect to the challenge of monetizing GenAI, do you see any parallels with the internet bubble of the mid-to-late nineties? At that time, there was massive infrastructure spending to support internet and broadband technology, but the real monetization eventually happened on the application side. Is that your expectation with GenAI?

A: Broadly, yes. I think this hardware cycle for generative AI feels a bit longer and more substantial than what happened in the fiber photonics-based, broadband internet period. It has been a bit more narrowly focused on Nvidia and a few other players. But I do think that yes, broadly speaking, more of the value will come from longer-term use of applications and services built on top of the hardware.

That's not to say that Nvidia isn't amazing, in terms of its technology and vision that graphics processing units (GPUs) would be necessary for data centers and an entire ecosystem. But at the end of the day, that's a nonrecurring source of revenue. So, we have to be patient to see how this all plays out.

I'm excited though to see what new companies come out of this that we never even heard of before, just like what happened during the broadband and internet days. There were companies like Sun Microsystems and Corning that had giant market caps. Then, suddenly there was a realization that there was enough capacity after all.

Companies like Amazon, Google, and eventually Facebook arrived and built on top of that. I think we'll see a similar dynamic—GenAI-first companies with new products, services, and applications that are native, cool, and helpful.

Q: Do you find it surprising that so many companies have struggled to figure out how to earn revenue from GenAI?

A: No, I'm not surprised. This is a natural step in AI's evolution. General technologies like the internet, mobile computing, or even electricity can take a very long time to realize all of their value. It's because there's an entire web of interdependencies before a particular use case might be feasible in the real world.

Let's revisit the internet example. Since the 1970s or 1980s, Hollywood has predicted that at some point we'll have mobile devices that can stream high-bandwidth video in real time. This eventually happened, but it took decades because of all the technology trees that had to be built to support that. I think we'll see a similar situation with the adoption of AI approaches and new technologies. It's going to take awhile to figure it out. There will be obvious use cases like processing information, conducting research, and executing tedious tasks. But the more sophisticated uses will take a lot of development, both on the "hard" side of technology, but also in shifting mindsets and organizations.

For all the talk about AI becoming a central nervous system or backbone of a company, there are so many organizational changes required to make that a reality in addition to the supply chain considerations to support it.

Q: What do you think those organizational changes will be?

A: With generative AI, it's not enough to focus on how to make the models themselves stronger or resolve their weak points like the risk of hallucination, for example.[3] Equally important is how we plug the models into broader systems. The reason we have so many kinds of assistants or copilots these days is that we've gotten better at using traditional database and language processing technology to feed the models the right information into short-term memory when needed.

People are talking so much about AI "agents" this year because they're racing to give these models tools. For example, when booking a vacation, you could specify your destination, budget, and number of people. You could instruct the model to perform specific actions like purchasing tickets and relaying passport information.

This is really interesting because it starts out as a straightforward automation of simple, tedious tasks. But at what point does that equation change?

My background is in economics. I view technology generally as a multiplier on the productivity of labor and capital. It's usually distinct. Very interesting things might happen once we get to a point where these models start infringing on labor. If we start treating these models as labor, then I think that's when things could really change. There has been a pivot from what many people thought GenAI was to a more agentic approach in the enterprise space. But it's still in the very early stages.

There's a certain thought exercise today, which asks: When will we see a 10-person unicorn company worth over a billion dollars? When will we see a one-person unicorn company? All the labor is just an army of models or agents. From there, it starts to get really weird! When might we see a zero-person unicorn, where it's entirely automated?

I think this exercise may be more abstract than useful today. But it's one way to see how the models continue to reach up the ladder in the value chain. They've started with an illusion that they understand you. When you go into the chat box and give it more knowledge to browse, you're essentially teaching it how to go through a library and look for things. It has an illusion of knowledge. And now, with reasoning, metacognition, and meta-reasoning, it seems to be arriving at a new point.

What happens if the complexity of computers starts meeting or exceeding, in very rough terms, the complexity of a human brain? With the exponential growth of the underlying hardware, that's quite conceivable in the next five to 15 years. Unfortunately, our brains are not evolving that fast, so this technology is going to surpass that complexity. What if, at some point, it gives us the illusion of being conscious and having a kind of persistent state that we can act on?

Q: Do you worry about the ramifications of that? Only a handful of companies can make that kind of investment. So, even if you have a "virtual brain" that's more complex than a human brain, you only have a handful of them. You won't have the diversity of human brains.

A. I think it's a real risk. With many technological shifts, there is a tendency to recentralize after a period of democratization. We saw this with personal computing moving away from mainframes in the late 1980s and 1990s and then going back to the cloud. Data scientists can make their own machine learning models, building and training them from scratch. And then it could migrate back to off-the-shelf models, where you're simply customizing them for what you need. It's difficult, I think, with all the talk about open-source models. There may not be enough to balance it out, and I think there could be real risks to diversity.

Footnotes

[1] Amazon is a holding in Polen's Focus Growth and Global Growth portfolios as of December 31, 2024.
[2] Visa and MasterCard are holdings in Polen's Focus Growth and Global Growth portfolios as of December 31, 2024.
[3] A hallucination describes a response generated by AI that contains false or misleading information presented as fact.html?id=166301.

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