

Some observations on generative text artificial intelligence's impact on libraries Part 1

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This column examines the current state of generative artificial intelligence (AI), emphasizing the importance of generative AI built on large language models (LLM). This is a foundational emerging technology, which has the potential to impact a broad range of other technologies. This is the first in a two-part series that together will provide a framework, to help information professionals understand the technology and anticipate future developments. This framework includes the following observations: future applications are unpredictable, interdependent, and will require flexibility, AI's ability to create the feeling of intelligence combined with the power of language are key to understanding its future, the technology is not neutral, it has biases and significant limitations, its widespread adoption will come with tradeoffs that matter, and finally I argue that libraries should develop a positive vision for how to use it.

This column will examine previous column topics through the lens of generative text AI to illustrate the scope of generative text-based AI's potential impact. This will lay the foundation for the next column, which will trade breadth for depth and focus on the nuances of search.

Setting the stage

Predicting how the future will be impacted by rapidly evolving technology is profoundly difficult. As a result, this column represents a series of observations and predictions rather than a single clear thesis. Use cases that seem important, may turn out to be dead ends. While others that are unexpected may emerge as the most transformative. Making specific claims about how generative text-based AI will change things is premature. Still, I believe that it is going to be a defining technology that will reshape the information ecosystem broadly and libraries with it.

What it can already do is enough to support this claim, and it is rapidly becoming more sophisticated.

For this column, generative text AI technologies, like ChatGPT, are understood as programs trained with LLMs to dynamically create text on demand in response to a prompt. Because of the foundational role of language in both technology and society, this kind of generative text AI can easily impact technology in many different arenas. For example, all software is built on the language of programming. Or, the fact that generative text AI will enable software to present itself as having dynamic responsive intelligence. Together this means that even a program that does not itself use generative text AI, can be programmed and updated more efficiently, and the user experience of it can incorporate a compelling dynamic help interface that can change the user's relationship and interaction with the technology. More broadly, language is critical for channeling human expression and communication. Anything that impacts how it flows through society will have a profound impact on our daily lives, including how we work and spend our leisure time.

ChatGPT is already the fastest-growing software application in history (Hu, 2023). Even though the current version broadly available (3.5) has already been surpassed in power and utility (by version 4.0), it is notably that not well designed as a consumer product. It was launched initially as a beta, using out-of-date information, ostensibly to help test the technology. ChatGPT's rapid growth underscores the appeal and utility of software that operates with language that is intuitive and emotionally engaging. As a pure tool, this technology will change how we write and program. Developers are already working to integrate it with existing products: from word processors,

to search engines, and much more. The ability to generate text that is responsive to the users' input makes interacting with other software more intuitive and can even make interacting with software feel like a relationship with something intelligent. Moreover, because the core of this technology is language, it can be endlessly manipulated, connected to other systems (technological, creative and societal) and has the potential to impact many fields. It is important to underscore that this technology will rapidly be felt in its first-order impacts, as well as second- and third-order ones.

Not only can this technology change how people write, providing draft outlines, sample paragraphs and assisting with editing, but it can also summarize text. It could help a songwriter generate ideas for a song, which a website writes about, which a user finds through a search application powered by generative text AI. The next generation of the AI might in turn be trained on the text of that website; the songwriter who wants to be found might be influenced by the incentives created by the website or the search. Every process in this stream is impacted, making it difficult to anticipate how these interactions will loop back into each other. In some areas, the generative text AI will fail to find traction and will have unexpected success in others, which makes it essential that libraries attempt to understand the underlying technology as it evolves.

Feeling of intelligence

Key to understanding this kind of generative text AI is that in important ways it does not attempt "understand" things in a way that is analogous to how we usually understand human intelligence. Generative text AI is not generalized artificial intelligence, able to make informed choices understanding the meaning of its words. Rather it is a language technology that

makes “guesses” about what to write next based on how the language it has been trained on is structured. Understanding this makes its many deficits obvious. It struggles to say “true” things and frequently “hallucinates,” or makes up new realities in response to prompts because confidently inventing lines of text in response to prompts is the core of what it is designed to do. As it does so, it replicates all the biases of the text on which it was trained.

“Capability overhang” is a term researchers use to describe the things an AI can do that its creators did not plan for – and did not know it could do (Lekhraj, 2023). For instance, ChatGPT was not designed to enable Tyler Cowen to interview Jonathan Swift, but it contained enough data about Jonathan Swift’s writings that it was able to generate plausible responses to his questions (Cowen, 2023). Nor was it designed to write songs, replicate an early internet online bulletin board, or dynamically generate a text-based fantasy RPG, but it can do all those things because they are based on connections between language contained in its training. The next generation of ChatGPT, ChatGPT-4, can access other data sources, interpret images, pass most standardized tests and more (Kelly, 2023).

For more detail on how this general process works, we can reexamine my previous columns on generative AI for images or the process as explained by ChatGPT itself (Fernandez, 2022, 2023). Unlike image generators, which create a new image pixel by pixel, what text-based generators make is predictions about what words should go next. The result is something that can feel lifelike and intelligent. Many respected technologists, linguists, brain scientists and other experts agree that there are severe limitations to its capabilities (Bogost, 2022; Weil, 2023; Wong, 2023). It is in many important ways less powerful and less useful than it might appear at first.

And yet, these limitations still leave it with the ability to elicit the feeling of intelligence, which I believe will only grow in sophistication. The ability to create compelling experiences that feel like interacting with something with intelligence is remarkable. There is robust literature about how and why humans anthropomorphize animals, objects

and even cooperate brands. Often to the detriment of their ability to recognize the true nature of what they are interacting with (Bruni *et al.*, 2018; Fournier *et al.*, 2015). Since generative text AI became widely available, it has become clear that for at least some people it can already elicit the feeling that the user is interacting with something compelling and intelligent. Most famously, a *NY Times* author had a conversation with Bing that ended with it declaring it wanted to be alive and trying to break up the author’s marriage (Roose, 2023). One researcher has trained it on the data from their existing messaging group so it can replicate the dynamics and personalities of their friends (Vincent, 2023). Fairly primitive AI chatbots focused on romance created by Replika left its users heartbroken after a policy change put an end to the relationships they once had (Bevan, 2023). And romantic companionship AI is already a key component of China’s AI (Minter, 2023). If this trend continues, the ability to provoke the feeling of intelligence will alone be enough to be transformative, even if nothing else about the technology develops. And given the rate of improvement seen so far, there is no reason to assume this technology will not continue to grow rapidly in its capabilities.

The scope of language

The scope of this technology is anything that can involve language or can be manipulated with language. This encompasses the emotional feeling of interacting with an intelligent entity as well as the ability to create a website by taking a photo of a sketch on a napkin. These examples are not drawn from future projections but from existing reality. While predicting the future is hard, generative text AI is developing fast enough that I suspect by the time you read this these examples may feel quaint.

This is likely the last column or email I will write without a word processor that has built-in AI assistance. AI assistance is already an option for web search and is being rapidly deployed even as it is being developed. A technology that impacts language, impacts almost everything. I can look back on most of the previous columns in this series and how they would have

been different if I had assumed the existence of high-quality generative AI.

For example, I co-wrote a column about library studios and multimedia production. Currently related technologies can allow users to transform their voice and mimic the sound of Kayne West (Harrison, 2023). A song purported to be written by AI, and sung in the style of the musical artist Drake has already gone viral on TikTok, with potentially profound legal implications for how companies like Google moderate content (Patel, 2023). Twitch hosts *Nothing, Forever*, a continually running lo-fi tv show written by generative AI that was the input into low-quality animation. Season 1 was a parodied *Seinfeld*, and Season 2 features a protagonist who starts each episode by writing a blog post on a random topic (Winslow, 2023). Soon neither the words nor the video will be quite as crude (Kuta, 2023).

In another arena, a recent column on TikTok emphasized the importance of the short video format to the success of the platform. TikTok can quickly adapt its algorithm to learn a user’s preference. When the cost of creating new content approaches zero, creating original tailored content that can be quickly refined to meet users’ preferences will also change. Google has already begun to roll out generative AI tools to a select group of ad buyers (Times, 2023). Previously, it was too expensive to create a whole animated sequence or song to show to one person to determine if they like it. However, as the cost of creation plummets, requiring only the processing power and a set of keywords, then a cartoon (or many other kinds of advertisements) can be generated and shown to a user, and if it fails, that advertisement becomes just another data point in finding out what they find engaging.

Furthermore, TikTok shows what social media can look like without the direct overlay of our relationships, which opens intriguing possibilities, as AI can elicit the feeling of intelligence in its users. Facebook has declared its intention to incorporate AI agents into millions of people (Heath, 2023b). SnapChat now allows users to add an AI persona as one of their “friends” (Heath, 2023a). Looking ahead social networks may operate entirely differently (including whole new models), as both

the content and the experience of them incorporates generative AI.

Similarly, a discussion of password management from years ago would now need to include the ability of cybercriminals to easily write malicious code, as well as more sophisticated phishing e-mails. Already there has been a report of criminals using AI to replicate the voice of someone to convince their family that they had been kidnapped (Patterson, 2023). Nor will this technology be limited to scammers. This column is not dwelling on the potential impact of this technology on coding, simply because the implications are too wide-ranging. Yet, as libraries frequently need to develop software, purchase software from vendors and interact with software daily, the potential disruption here should not be completely ignored. Features such as the ability to do things like take a photograph of a napkin that has a sketch of a website and turn that sketch into a functioning website can open new possibilities for noncoders and supercharge the productivity of professional software engineers. The example of password management however is indicative of the fact that these implications will not all be good. Libraries and users will need to operate in a world where manipulating software is even more accessible than ever before.

The columns written about the pandemic touched briefly on technologies that facilitated remote work and the automation that was centered on the physical world instead of knowledge creation, absorption and dissemination. Soon I will be able to ask my e-mail client to summarize longer e-mails or rewrite them as children's fables. Zoom is already working on a feature to transcribe meetings for minutes or help users who arrive late catch up on what they missed (Roth, 2023). The Zoom example highlights the way that technology can be impacted by generative text AI simply because it facilitates language and information sharing. Because the content of a Zoom meeting can be transcribed, it can be turned into text, and it can then be manipulated. Meetings are in some ways an ideal use case because there is often structure to the format of the meeting, as well as to how people want the notes of the meeting formatted afterward. How well it will be able to be integrated

remains to be seen, but all the elements are in place.

Conclusion

The list of potential applications for generative text AI are endless, but the point is that libraries should be attuned to the fact that language is critical to how society is structured and how humans interact. This ranges from the realm of software created through programming languages to how humans interact with technology on an emotional level. This technology can elicit the feeling of interacting with something intelligent, and as that becomes more refined, it will become more powerful. Once artificial intelligence can reliably generate language, it fundamentally shifts both the creation and absorption of information. The next column will continue to explore these themes through the prism of search and will develop a series of observations to help guide information professionals in thinking about this technology as it develops.

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