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GenAI, ChatGPT & Pricing: Handy Tools or Pricing Revolution?

About the Author

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> *By the end of this eBook, you will have ticked off all the knowledge you ever wanted to know on the following on GenAI and ChatGPT in the pricing space including.....*

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Introduction

The foundations of ChatGPT, and GenAI in general, are grounded in probabilities and technology, and have long existed for longer than many think, but its sudden emergence into the mainstream has sparked widespread surprise. Its inner workings have remained elusive, leading to sensational speculation regarding its capabilities. The central question has revolved around whether it was a mere mimicry machine or an artificial intelligence (AI) with the capacity to tackle any problem. Furthermore, an exploration of where such technologies might find their true value was warranted. It is easy to view everything through the lens of a newfound tool, but a measured and rational assessment is crucial to assessing GenAI, ChatGPT & pricing.

At Pricefx, we have more than a decade's worth of experience at the cutting-edge of the pricing industry. As the world's leading enterprise-grade cloud-native pricing software vendor, we take immense pride in using the power of innovative technologies to help solve top-line business problems and boost profits and growth for our clients. And naturally, that includes taking a long, hard look at ChatGPT and other GenAI tools, their competitors, and related technologies through our unique pricing lens.

It is crucial to note that while ChatGPT and other Generative AI prompts and tools (and pricing software too for that matter!) provide valuable insights, they should only be used as a supplement to—and not a replacement for—human expertise and judgment.

Pricing decisions require a comprehensive understanding of the business context, market conditions, and customer needs.

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Nothing in this eBook is intended to suggest any affiliation with or sponsorship by companies other than Pricefx.

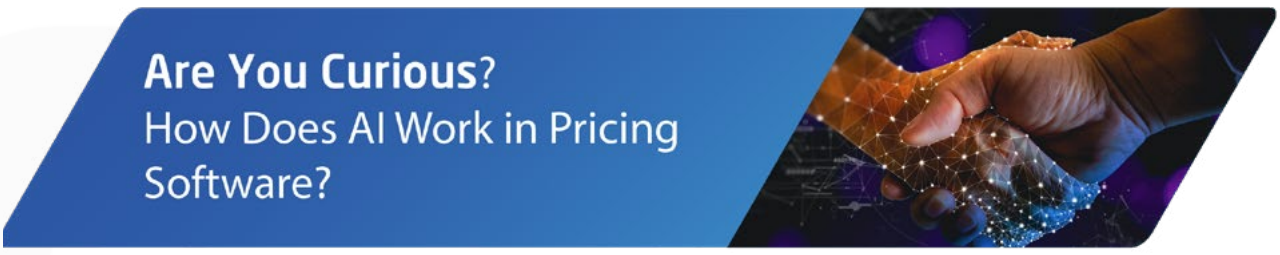
Now that more than a year has passed since its debut, a lot of the 'technology and user experience dust' has settled around ChatGPT and its peers. It is a prime time to consider deeply where we sit with these GenAI systems and their relationship with the pricing industry. These AI systems leverage well-established technologies and have distinctive strengths and limitations too in practical use. But as a leading pricing technological innovator, Pricefx continues to invest in the leading AI technologies to drive value for our customers. Naturally, that includes the exciting expanding domain and use cases for GenAI within our pricing software solution as we will discuss at length later in this eBook.

It is a unique moment in time and an opportune moment to consider how technologies such as GenAI, and Large Language Models (LLMs), can genuinely benefit us and to explain what GenAI applications we already have planned coming soon in the Pricefx solution, without getting caught up in the distractions of GenAI's original introductory hype.

GenAI is like a 'language calculator.'

- It is not about crunching numbers; it is about crafting the perfect words. That is it.
- It is NOT a replacement for the predictive AI of pricing software, AI Optimization nor CPQ software.
- GenAI is simply another tool that we are building into our software, to help our customers price more easily and fluently and go about achieving their optimal business outcomes that outpace the competition - but doing it all with a minimum of fuss.
- The Predictive AI used in pricing software is altogether different from GenAI.

Learn About It in the Article Below:



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In this in-depth study we will supply you with an overview of the GenAI technology and analyze its strengths and weaknesses through the lens of a pricing vendor. We will dip our toes into the user experience of GenAI before diving deep into the world of applying GenAI into pricing processes and pricing software solutions.

1. An Overview of What's Behind the Technology Curtains of GenAI

While ChatGPT and similar GenAI technologies appear as a "revolution" in AI software because of their sudden emergence into mainstream adoption, at Pricefx, we view them as a natural and exciting evolution of AI.

A reminder too though, that GenAI (and all other AIs including the predictive AI that drives our Pricefx AI Optimization) are inter-dependent and should be "composed" (meaning that the resulting AI solution is made of multiple inter-dependent specialized algorithms originating from multiple AI domains, like Lego bricks of different shapes and colors being assembled on a board).

To be successful at GenAI, companies should establish roadmaps today and prepare their platforms, data, and predictive and prescriptive AIs as they are the foundation of GenAI.

As such, GenAI perfectly fits in both Pricefx's experience and vision of using multiple algorithms and AI approaches as they become available. In fact, Pricefx uses the same models that power large language models (LLMs) today to complement other AIs like our product similarity accelerator and other upcoming GenAI tools that we will touch on later in the section of this eBook.

ChatGPT, the AI-powered chatbot released only a short time ago in December 2022, brought GenAI into the user mainstream. With it, came the now widespread realization that GenAI relies on multiple AI technologies and techniques. Competitors to ChatGPT such as Google Gemini and Bing AI Chat are similar. It is important to note that ChatGPT is a commercial product that is not open source, meaning its owner OpenAI protects its design. Open-source alternatives do exist but have encountered less success, which is understandable and is changing over time as stakeholders demand transparency and control, and AI practitioners are carefully navigating the sometimes-subtle differences between applications (in this case, AI chatbots) and underlying AI technologies (LLMs, GenAI in general) as the destinies of these two could be completely diverging in the future.

Let's dive into GenAI and the technology that is behind these AI-powered chatbots...

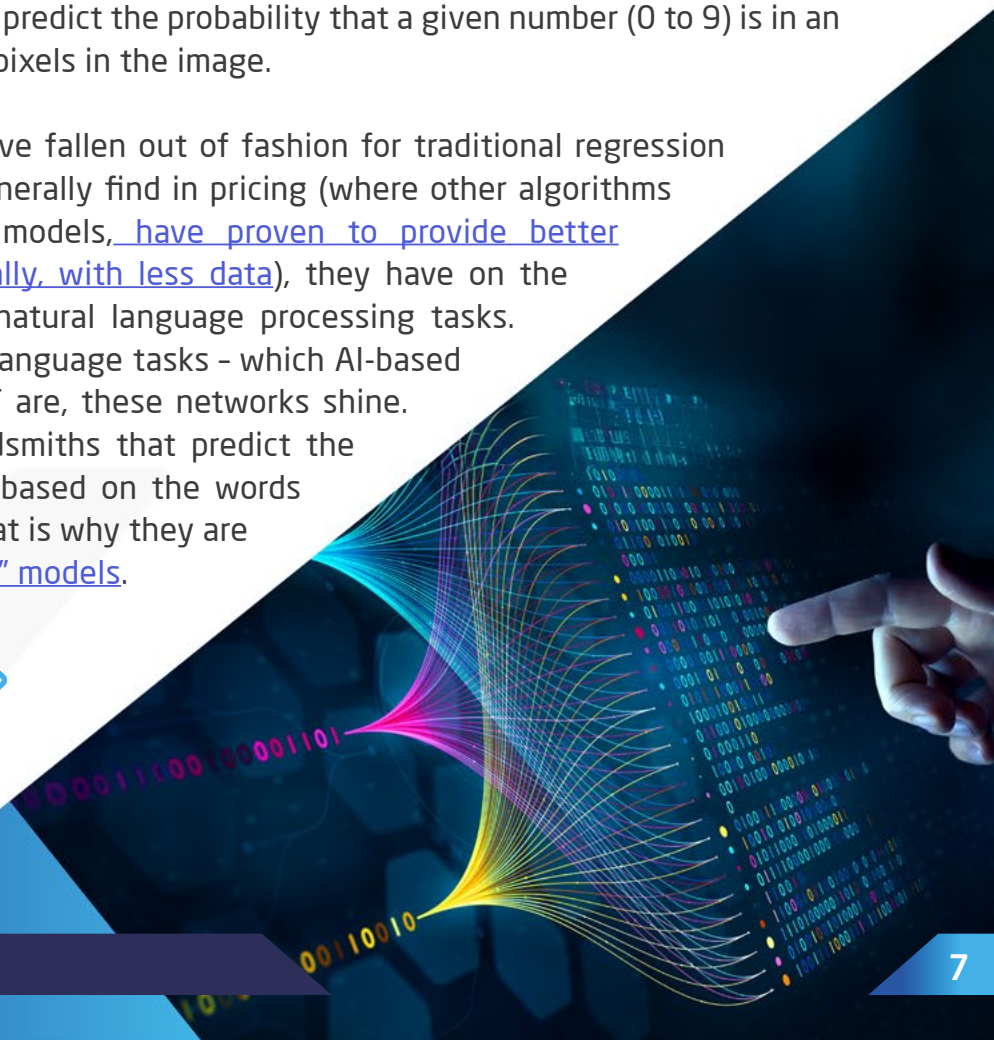
1.1 Large Language Models (LLMs) and Natural Language Processing (NLP)

So let's take a sneak peek behind the technology curtains of GenAI. At the heart of it all is what we call Large Language Models (LLMs). Now, these are no ordinary neural networks; they are the superheroes of deep learning, specifically designed for something called Natural Language Processing (NLP). Just think of them as massive networks of digital neurons that work together to make sense of our language, like how our own brains process information.

But what makes an LLM "large"? It is all about the numbers - the parameters, to be precise. You can think of parameters as the building blocks of the neural network. In the latest ChatGPT version (at the time of writing), the LLM boasts an astonishing two trillion parameters! These numbers help the neural network predict what comes next in a sentence, be it the next word in a chat or a sentence in a story.

Here is where it gets fascinating. These neural networks are not new; they have been around since the early 1990s, mainly used for processing unstructured data like recognizing images or understanding text. For example, a basic application of a neural network is to be trained to predict the probability that a given number (0 to 9) is in an input image based on the pixels in the image.

While Neural Networks have fallen out of fashion for traditional regression tasks like the ones we generally find in pricing (where other algorithms in particular tree-based models, have proven to provide better performance, and, especially, with less data), they have on the contrary been central in natural language processing tasks. When it comes to natural language tasks - which AI-based chatbots such as ChatGPT are, these networks shine. They are like digital wordsmiths that predict the next word in a sentence based on the words you have already used. That is why they are known as "auto-regressive" models.



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But here is the catch: they do it word by word, just like how you type on your smartphone keyboard. It is a step-by-step prediction, not an all-at-once kind of deal like humans do.

For example, an LLM will first predict Christopher, then Columbus, then discovered, then America, then in 1492, and at no point will this sentence be evaluated holistically for logicality or consistency.

As it currently stands, the Language Models (LLMs) used in the main AI-powered chatbots can process a few thousands previous words in a conversation, ensuring a smooth and natural flow in the chat. The chatbot can entertain a conversation and ingest inputs such as documents, up to certain limits. This explains the many experiments around prompting and whether users should ask questions directly ("zero-shot prompting") or on the contrary lead with a conversation that will progressively lead to the desired result ("chain of thought prompting").

Now, we will dive deeper into the secrets of ChatGPT and what makes it tick.

1.2 The GPT Algorithm Developed by OpenAI

The GPT algorithm is not simply a run-of-the-mill LLM; it is built on a foundation called the Transformer architecture (originally Google featured the significant 'Transformer' architecture breakthrough in a 2017 research paper) which makes it a superstar in NLP. It is like having different rooms in your AI mansion, each dedicated to transforming data in a specific way. This approach, called feature engineering, is what adds layers to the magic trick, making it all come together seamlessly.

GenAI is a lot like a fine-tuned orchestra. It is not just the instruments; it is the conductor, the practice sessions, and the connection with the audience that make the show memorable. OpenAI has made ChatGPT stand out by refining its model design and carefully fine-tuning it with cleverly transformed data and innovative methodologies. And, like all musician's, they have a secret sauce: reinforcement learning (specifically, multiple rounds of reinforcement learning with human feedback). This is how ChatGPT learns from its interactions with users, becoming a better conversationalist over time.

But remember, a musician's act would not be as impressive without an enthusiastic audience. So, while the technology is marvelous, it is not complete without the interaction of humans like you and me. OpenAI has put a great deal of thought into how people interact with ChatGPT. They have learned from feedback and adjust their application on a regular basis to ensure it is both helpful and safe. Part of that effort has already included enormous changes to the architecture of the underlying model, including an attempt to focus on smaller and specialized models. Now, as with any good magician, OpenAI keeps some of the finer details of the act a secret. But one thing is for sure: In the AI-powered race, change is the only constant.

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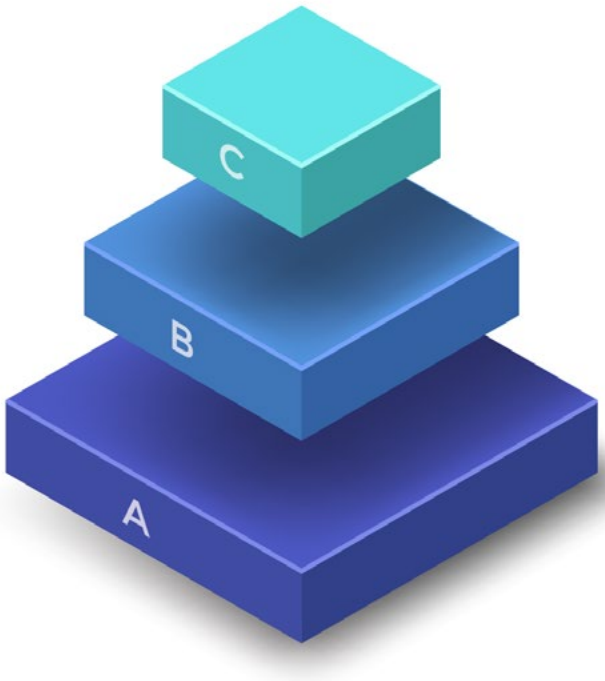
The GenAI Pyramid & Its Layers



C. Applications - Generative AI in Action

- Chatbots such as ChatGPT, Google Gemini, Microsoft Copilot etc. are example of chatbots.
- There are other applications of GenAI, though most deal with text/unstructed data.

B. Models & Techniques Used - The Foundation

- Neural networks are foundational brick of Generative AI. Large Language Models are a flavor of neural network.
- Many other techniques are employed to make these useful, such as Reinforcement Learning.

A. AI domains - The Building Blocks

- At its core, Generative AI blends multiple branches of AI including Natural Language Processing, often powered by Deep Learning.

2. The Strengths & Weakness of GenAI

Now that we have covered definitions, let's see what the implications of these technical choices are. In this section, we will look at technical implications as well as observations from current "best in class" chatbots or LLMs.

First off and importantly, GenAI is not so new, and it is not the only AI in town. We have had AI wizards like Siri, chatbots, and even Google Search doing their generative NLP and cognitive AI stints for years. And there is a diverse cast of other AI characters;

- Autonomous AI (think Tesla's self-driving tech)
- The predictive and prescriptive AI that are essential for the Pricefx pricing software models. In particular, Pricefx's multi-agent optimizer which uses Agent-based AI to understand and optimize across all pricing waterfall elements.
- And machine learning (ML), the oldest flavor.

2.1 The Strengths of GenAI

2.1.1 GenAI Specializes in Unstructured Data

When it comes to unstructured data, especially natural language text, GenAI shines as the star of the show. It flaunts multilingual prowess, conversing fluently in various languages, summarizing text, rectifying grammar, and weaving intricate translations. GenAI tames the nuances of language intricacies like tone, style, and context, transforming it into an extraordinary linguistic virtuoso.

For example, check out my recent article for how our Pricefx Generative AI can augment your CPQ experience;

2.1.2 Creativity Superpowers

One of GenAI's most remarkable powers is its innate creativity. Beyond its chatbot duties, it possesses the talent to craft images, compose melodies, and even provide delightfully written text answers to perplexing law exam questions. It is as if you have an artistic prodigy readily at your disposal, potentially conjuring artistic masterpieces given quality, correct and creative prompts.

However, it is not perfect and nor is it a replacement for predictive AI. It is not better. It is not worse. It is not the same as predictive AI, it is simply different. GenAI is purpose-built for what it does and what it does, it does very well. That is exactly why at Pricefx we see GenAi as a critical part of our AI future moving forward, but at the same a quite different AI beast altogether from our predictive AI.

2.2 The Weaknesses of GenAI

However, at the same time, it is also crucial to recognize GenAI's limitations that include the following;

2.2.1 Lacking Comprehension and Numeracy Skills

While it might seem intelligent, GenAI lacks genuine comprehension. GenAI operates by predicting one word at a time, like predictive text on a smartphone. This means it does not grasp the entirety of a sentence, functioning more as a word conjurer than a cognitive thinker, let alone being a number cruncher.

GenAI tools are simply not number crunchers at all. Anyone that has asked a GenAI tool to complete a task as simple as to count the number of words in a paragraph (and experienced the rather odd results) will know that is currently not the type of tool to track how many products your global enterprise business currently has on your product lists.

Pricing Software are data and numbers' applications. Using GenAI for numbers problems is like using a dictionary to solve a math problem when you should be using a calculator. As we move through the 'hype cycle' people will realize with GenAI , it is a 'language calculator.' Useful, but not intelligent.

2.2.2 Logic Deficits

Another limitation lies in GenAI's absence of logic. It operates like a young child repeating "1+1=2" without truly understanding the concept of mathematics. It does not craft responses through reasoning but rather predicts the most likely next word based on context. This is the most critical distinction between current AIs and the way intelligent creatures think and plan before they act.

However, there is progress in the works to equip GenAI with logic-handling capabilities, allowing it to tackle challenges and riddles effectively. And while this has limitations, Google Gemini, for example, excels at learning to detect logic challenges and riddles and turn them into algorithms, such as:

> ***You have a wheel that is divided in 7 slices, one for each day of the week. The day is currently set to Friday. What happens if you turn the wheel 4 times?***

Google Gemini will create a python algorithm and solve it.

2.2.3 Subject to Prompt Quality

GenAI answers are often dependent on/sensitive to the prompt used, and two equivalent prompts worded differently can lead to extremely different answers, and potentially only one of which may be valid. As a side effect, when asking for explanations on an answer, the chatbot can also often contradict its original answer.

What's more, slight variations in phrasing or in context may yield different responses, akin to ordering a coffee with minor changes (cream, no sugar, sweetener, almond milk, half-and-half etc.) resulting in a distinct and personalized brew. The same can be said about changes in training data: There are few guarantees that a new version of the model would produce the same results with the same prompts unless the model is subject to intense and complex learning and post-processing.

- **In general, chatbots are extremely sensitive to prompt quality, much beyond the "garbage in garbage out" phenomenon often experienced in other AI applications.**
- **An inability to explain reasoning, sources and data used to generate results is a common issue with models based on neural networks.**

2.2.4 Knowledge 'Hallucinations'

GenAI's performance is not devoid of quirks. It can occasionally conjure information that does not exist, creating what are known as "hallucinations." Furthermore, GenAI does not admit when it does not know something, confidently delivering incorrect responses. This can be likened to someone who steadfastly believes they are right, even when they are not.

GenAI can 'fabricate' information to support arguments and create events that never took place. This New York Times article shows the extent to which GenAI can still currently 'hallucinate.'

Consequently, GenAI users must double check anything that comes out of GenAI. And, over time, they must also grasp and make a concerted effort to assess for which tasks AI-powered chatbots are well-suited (Harvard researchers recently referred to this as "navigating the jagged frontier").

2.2.5 Explanation Deficits

Lastly, GenAI struggles to explain its thought process, unlike humans who can clarify their reasoning. It operates like a magician who performs tricks without revealing the secrets behind them, leaving its operations shrouded in mystery which can be a problem for pricing practitioners who naturally are very keen on keeping abreast of pricing insights and understanding the hows and whys of what the data reveals to them.

This inability to know how data and knowledge are flowing in these models has far-reaching consequences. First, it creates fundamental conflicts with many other aspects of pricing and AI including privacy and confidentiality, data protection and copyright, not to mention broader regulatory and societal concerns. But it also makes it extremely hard to know if the LLM is transforming knowledge, or merely repeating something that existed in the training data? On that note, recent research from Google suggests the latter: LLMs struggle to "generalize" knowledge. In other words, LLMs know because very similar knowledge exists in their enormous training data set - A common phenomenon in data science called "data contamination."

2.2.6 Enormous Data Dependency

In addition to these cognitive quirks, the immense size, and data dependency of GenAI require substantial resources for training and deployment.

GenAI is enormous – it is like having a circus tent full of data. Training this AI is not cheap; it costs millions and takes weeks. **For example, training GPT-4 cost more than USD$100 million and took weeks.**

Of course, some applications may be getting away with infrequent training and smaller models to save costs.

But the "Large" in LLMs also implies large inference costs. For LLMs, inference is the process of computing the results, which in this case consists in performing the prediction of the response by evaluating the combination of the knowledge of the trained model with the user's new information. As trillions of calculations must be performed whenever a user needs an answer, the bill grows quickly.

3. Will GenAI Improve?

The elephant in the room question is "will GenAI improve?" There is a lot of optimism in the air. With time and more data, it is bound to get better. Data reflecting user feedback, and typical machine learning techniques will all work their magic. Data scientists know that models need to "leave and breathe" to incrementally improve, and many of them are working to polish the LLMs behind AI-powered chatbots. We have already seen drastic improvements in GenAI including, for example, the ability to consider more recent, specific data, or real-time data to extend the fixed training data, or to delegate tasks to specialized APIs when needed.

Regarding the chatbots, some skeptics have their doubts. They think that even with all the improvements, there might still be a little gap that is hard to fill to make them robust enough to be useful in the long term. Many use cases (such as natural language processing) are great fits, but generalization is a challenge.

Like self-driving cars – they are amazing, but they are not perfect – and this "gap to perfection" prevents drivers from massively adopting them and trusting them – even after refining the AI behind self-driving cars for a decade.

Complexity and costs may doom current LLMs and chatbots. The technological choice of scaling LLMs to such gigantic sizes to improve their capabilities and accuracy might be short-lived, as most AI applications are bleeding money.

What's more, there are additional facets of this complexity, particularly in the realm of legal, copyright, and intellectual property:

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Legal, Copyright & Intellectual Property Facets of GenAI:

Legal Hurdles - Copyright & Plagiarism:

As LLMs generate responses based on vast tracts of data, they run the risk of inadvertently generating content that infringes upon copyrights or patents. Navigating legal compliance in various jurisdictions is a daunting task.

Ensuring that the content produced does not breach copyright laws is a substantial challenge for Gen AI companies. AI developers must grapple with the legal intricacies involved, as evidenced by the December 2023 case brought by the New York Times on OpenAI and Microsoft for alleged copyright breaches.

Developers need to implement safeguards to mitigate these risks and ensure the AI respects copyright boundaries.

Data Privacy and Confidentiality:

LLMs deal with a deluge of data, some of which might be sensitive or confidential. The mishandling of such data can have far-reaching legal and ethical implications. Striking a balance between mining data for insights and respecting privacy and confidentiality is a complex task that AI developers must navigate.

Fair Use & Transformative Work

When LLMs generate content based on existing sources, distinguishing between fair use, transformative work, and potential infringement becomes a nuanced challenge. Developers and users alike must tread carefully to ensure their AI-generated content adheres to these legal principles.

So, GenAI has its ups and downs, and its fate might depend on how these challenges are tackled. For the time being, it is safe to assume that LLMs will remain the central piece of GenAI, with their intrinsic strengths and weaknesses. We will keep watching the GenAI show and see how the story unfolds. There is no reason to treat GenAI differently than how we evaluate other models and technologies. When new tools can add value to our users and customers, we gladly prioritize them. What's more, with our opened platform and its standardized API capability, Pricefx customers can integrate third-party AI-based tools into their pricing solution easily.

4. The User Experience of Chat GPT & GenAI

AI-driven chatbots have introduced users to a unique conversational interface, with both text and voice-based interactions growing increasingly popular. However, it is important to recognize that these conversational experiences sometimes introduce friction.

4.1 GenAI User Experiences Challenges

4.1.1 Preference for Self-Service

Language is the way humans use to exchange information between themselves, and the latest enhancements in GenAI mean that using language to interact with computers is becoming increasingly available. But available does not mean required. Most brands we interact with have spent the last two decades digitalizing interactions and developing self-service capabilities as they are often preferred by customers. For example, modern interactions with brands involve self-service through apps for activities like shopping, ordering food, banking, entertainment, etc. This approach is typically faster and more efficient than typing or talking, which can be comparatively slower and might involve multiple iterations to ensure accurate communication. Natural language conversations with AI-powered chatbots such as ChatGPT suffer from similar if not worse pain points, meaning the user experience behind GenAI will only fit a limited set of interactions.

Natural Language interactions are likely to be adopted in areas where traditional self-service interactions were difficult or inaccessible, and where the incremental value delivered by the system exceeds the time spent on prompting. Conversely, deploying GenAI for Natural Language Processing in areas that already enjoy relatively powerful self-service user experiences seems counterproductive.

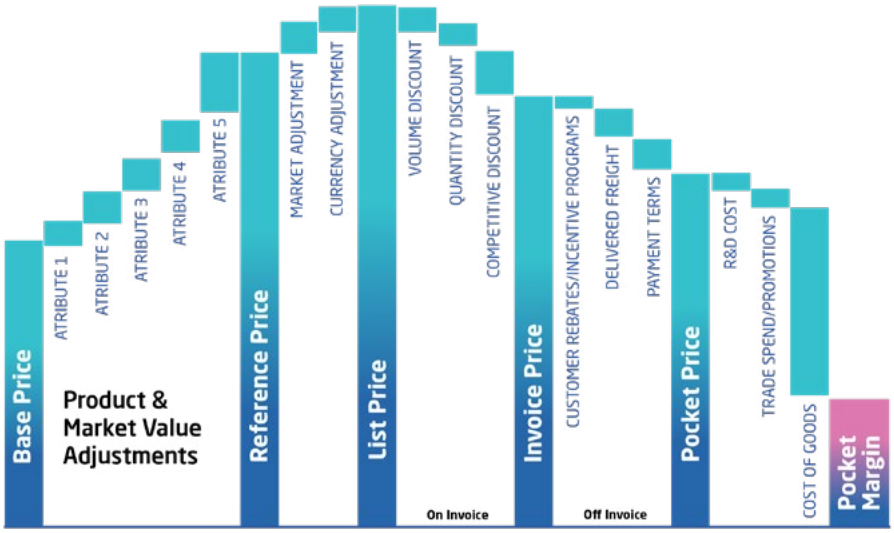
4.1.2 Visual Information Preference

Users often prefer visual information like charts, colors, and bullet points, especially in data-centric domains like pricing.

In the context of pricing, visual information plays a vital role. Pricing professionals often deal with complex datasets, market trends, and pricing strategies. These intricacies are often better understood and communicated through visual representations than through GenAI generated text.

For instance, when analyzing pricing strategies for a range of products within a portfolio, pricers may prefer viewing a color-coded chart that clearly highlights how each product is positioned in the market based on pricing tiers and profit margins.

A pricing waterfall like the example below is perhaps the ultimate example of this.



This visual representation allows pricers to quickly spot trends and anomalies, enhancing their decision-making process and enabling them to develop more effective pricing strategies.

This is not to say that select users would not prefer textual descriptions in lieu of analytics. But two critical limitations must be accounted for. First, data analysis is an area that is technologically out of reach of LLMs, which cannot handle data and mathematics well. Second, for any reasonably complex chart, conclusions and interpretations done by a human can be diverse and subjective.

We will explore in the next chapter how LLMs might help translate simple data points as text.

4.1.3 Response Times

Given the complexity and size of LLMs, their response times can be slow, making it crucial that the user's engagement is genuinely valuable.

Slow loading times combined with many potential errors and hallucinations can lead to poor user experiences in GenAI reactivity. What's more, spending your time checking the content generated for accuracy may eliminate any time savings. The answer is knowing what you want from GenAI, the quality of how you ask for responses and double checking GenAI's outputs.

And in pricing, there is another aspect of time to consider: Data timeliness. For pricing professionals, especially in industries with rapidly fluctuating dynamics, the time dimension is of paramount importance. Take for instance, a manufacturing company that relies on various raw materials in its production process. The prices of these raw materials can shift within minutes or even seconds due to market volatility, geopolitical events, or supply chain disruptions.

In such scenarios, receiving a timely response from pricing software, based on real-time data and predictive analysis, can translate into millions of dollars in savings or increased revenue. It enables pricers to make immediate decisions that can mitigate losses from sudden price hikes or seize opportunities when prices are favorable, significantly impacting the company's bottom line.

This level of responsiveness becomes a competitive advantage in dynamic markets, where swift adjustments to pricing strategies can ensure a company's survival and prosperity.

4.1.4 Seamless Integration

Ideally, GenAI should be seamlessly integrated into applications to minimize any friction. GitHub Copilot's success is a testament to this approach, as it is fully embedded in developers' applications, and Google uses a similar strategy with GenAI responses during searches. These two examples highlight where GAFAM (Google (Alphabet); Apple; Facebook (Meta); Amazon; and Microsoft) succeed in the ability to bring AI into our lives seamlessly. Other players have struggled historically, which could indicate that GenAI must live in separate disconnected applications, potentially breaking user flows. This is the case for the vast majority of ChatGPT use cases today, and something that has caused adoption challenges for predictive and prescriptive pricing AI at companies relying on legacy pricing systems today.

4.1.5 User Decline Dips for ChatGPT

Recent user number declines for ChatGPT during certain periods have been seen to be at least partly attributed to user experience challenges. However, to be fair, other factors like the 2023 summer school and college vacation period could also be seen as factors contributing to the decline in ChatGPT user numbers.

Clearly then, as GenAI begins to become widely adopted into the pricing industry (as we will discuss in the next section), it is apparent that it is becoming incorporated into applications, thus reducing user friction, especially for complex and time-consuming tasks or by users unfamiliar with the technology. This path to integration and user adoption mirrors the broader trend in AI applications where much of the focus is not only on the models and algorithms but also on development of seamless integrations and user experiences.

5. GenAI for Pricing

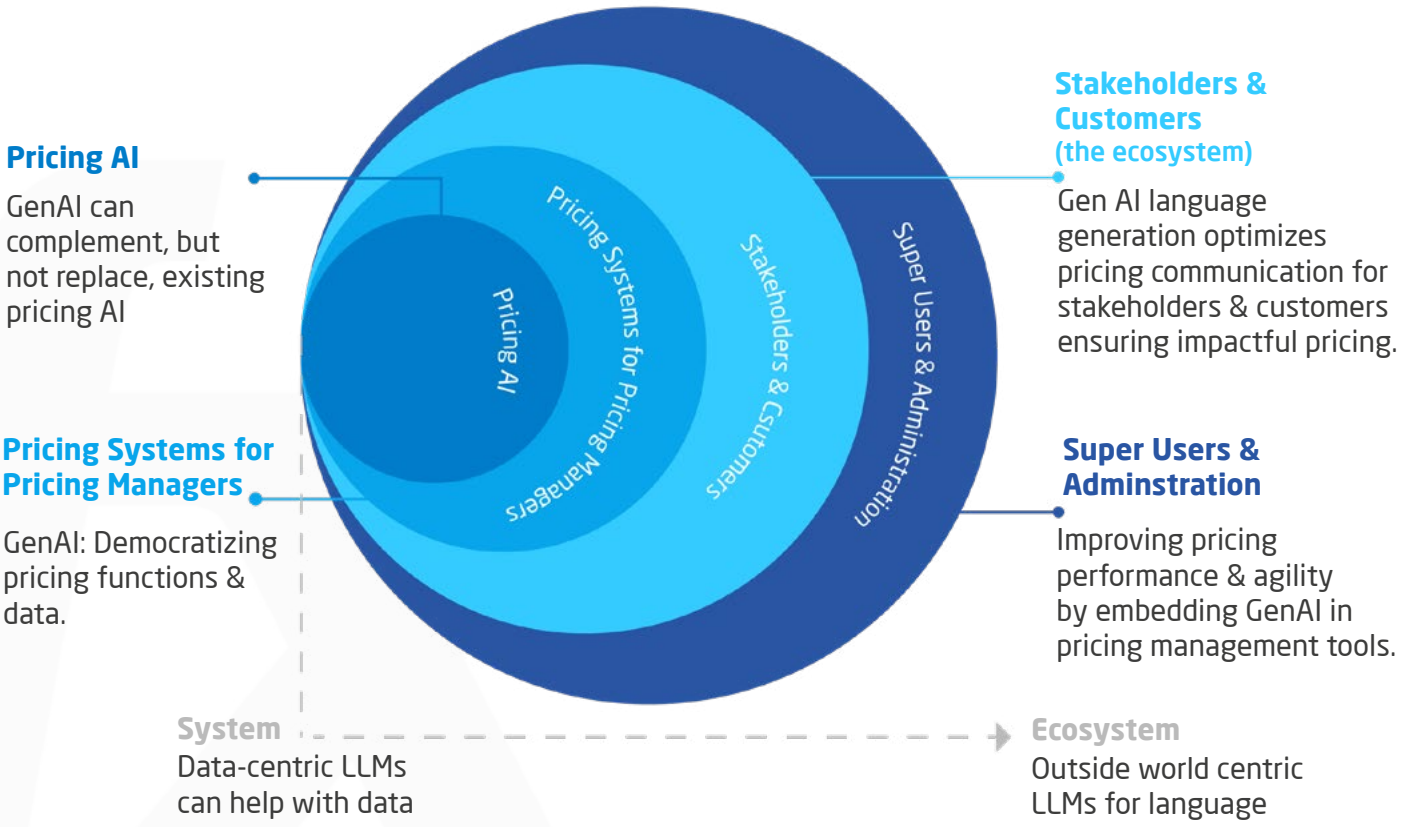
GenAI, represented by Large Language Models (LLMs) and chatbots, does not aim to supplant the existing pricing processes; instead, it can be seen as a complementary tool for enhancing human-machine collaboration within pricing. These complements are applicable throughout areas and stakeholders, much beyond the reach that predictive and prescriptive AI has been enjoying in the past.

One of GenAI's most compelling features is its versatility. It can adapt to a wide range of tasks, from writing poetry and stories to generating conversational chatbot responses. The key is that GenAI is not confined to a single niche. It is a generalist, capable of assisting across various domains. For businesses, this means harnessing its creative prowess for content marketing, chatbots, product descriptions, and more.

In contrast, predictive AI in pricing software focuses on specific tasks—determining optimal prices, detecting market trends, and adjusting strategies accordingly. It is brilliant at what it does but operates within a well-defined framework. GenAI, on the other hand, thrives in the realm of human language, where creativity and diversity merge.

GenAI applicability across multiple "layers" of pricing

We believe GenAI will ultimately be applicable in:



5.1 Data and Pricing AI: Complement but Not Replace

Several longstanding challenges in the application of AI to pricing have held back progress, including issues like;

- **Data Challenges:** The scarcity of relevant data, abundance of noise, and dealing with unstructured data have always been bottlenecks in pricing applications.
- **Timeliness:** Pricing is a domain where time sensitivity is paramount. Prices change rapidly, often in response to market dynamics, geopolitical events, or supply chain disruptions. The opposite is also true, as plenty of long-term agreements and processes prevent practitioners from collecting data and driving results quickly.
- **Transparency and Compliance:** Pricing professionals have long desired transparent, data-driven, auditable, and deterministic processes, which are not only interpretable but also comply with regulatory requirements.

Despite the hype around AI, the last thing pricing managers want is AI taking over everything; they would rather carefully control the level of automation.

Given that GenAI primarily deals with unstructured data and lacks analytical and logical capabilities, it is not a replacement but a complement to predictive AI in pricing. Depending on markets and industries, companies can have little structured data at their disposal but access to various sources of unstructured data which is hard to import and process today.

GenAI or AI-powered chatbots can help companies to turn this data into formats that can be more easily analyzed in a pricing system, avoiding hours of manual effort and third-party research accessing complex competitive data or deciphering intricate product descriptions and instead leveraging GenAI's expertise in interpreting natural language and uncovering structured attributes or connections within data.

For instance, at Pricefx, an LLM is employed to identify substitute products based on unstructured textual descriptions, illustrating the value of GenAI for tasks of this non-directly pricing-related nature. Harnessing innovative natural language processing and data analytics, Pricefx's AI technology dives into vast datasets to identify similarities between products. By leveraging GenAI, Pricefx empowers customers to effortlessly group products into families, much like how a chat engine intelligently dissects and analyzes text blocks.

GenAI is like a 'language calculator' It is not about crunching numbers; it is about crafting the perfect words.

The Predictive AI used in pricing software for optimization purposes in particular is altogether different from (and complementary to) GenAI.

Vice versa, LLMs can turn the structured data coming from prescriptive and predictive AI into natural language. This makes high-quality data and predictions a prerequisite to ensure that GenAI is successful at other tasks. Practitioners should expect to see prescriptive and predictive AI and GenAI to be increasingly complimentary over time. Savvy businesses already know how to combine multiple algorithms to improve the performance and accuracy of their price optimization logic, and GenAI can take this vision of "composable AI" to new heights.

5.2 Pricing Managers and System Users: Democratizing & Unlocking New Capabilities

Pricing is a data-intensive domain that should be accessible throughout an organization. GenAI can help make this democratization possible, offering natural language interactions through text or voice. It can simplify complex tasks and broaden the capabilities of non-expert users, without displacing existing AI tools. GenAI can offer an additional user experience that not only promotes accessibility but also fundamentally transforms the way businesses interact with pricing data. This accessibility empowers users beyond traditional experts, reducing the reliance on specialized personnel and creating a more agile pricing ecosystem. This transformation may not only potentially enhance the bottom line but also elevate the overall resilience and competitiveness of businesses.

In current pricing systems, there are several immediate use cases that typically require a good amount of experience and skills:

- Creating complex charts from natural language data queries
- Transforming data from newly imported data feeds
- Creating or interpreting complex formulas that calculate prices or other metrics throughout the pricing system
- Creating advanced data queries on price lists or agreements, which can be used for alerting or analytics
- Look for equivalent deals or customers using natural language queries
- A broader navigation help, which can help guide new users by learning from past similar clickstreams

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The conversational user experience supported by GenAI introduced by Pricefx is an example of an extended user experience to democratize access to data and insights and improve the speed of decision-making by facilitating the creation and actionability of curated insights and recommendations. Deploying a tailored and open source LLM technology, our GenAI Actionable Insights will enable a natural language-based processing and generation to create and serve prescriptive and predictive insights that users can leverage to quickly identify opportunities and risks that have the biggest volume, revenue, and margin impact for the company. GenAI LLM capabilities are also now part of our product Knowledge Base, enabling natural language chat-based search and discovery for the entire online training and education website for Pricefx products and services, and in our Product Similarity Accelerator to identify substitute products to upsell and cross sell.

5.3 Beyond the System: Maximizing the Impact of Pricing in the Stakeholder and Customer Ecosystem

But of course, pricing is not simply about numbers; it is a whole ecosystem. Customers and organizations interact with prices and products in ways that require context, rationales, and support. Pricing departments need language capabilities to maximize the impact of current pricing systems, processes, and AI on stakeholders and customers. Natural language processing can help bridge the gap between systems and people, allowing for more seamless interaction with customers and stakeholders by offering a greater degree of automation on top of structured and unstructured data.

5.4 Can GenAI Help Super-Users to Craft a Better System?

The past three years have demonstrated that businesses need the ability to im-lement large-scale commercial changes at lightning speeds. Any technology that can help pricing processes and systems to change faster provides immense long-term value. At Pricefx, we are already the most flexible and self-service pricing platform available, but as the latest AI-based applications we have on our radar indicate, GenAI is opening a future world where flexibility and change can be even more accessible, faster, and sustainable.

Think of the ability to experiment even faster with fewer technical resources. This is the assurance that pricing is never a bottleneck, but a driver of company-wide innovation ensuring that companies can delight customers with better offers fast-er and monetize this value accordingly.

One of the most common bottlenecks in the pricing space today is dealing with data: extracting from systems of records, transferring, importing, transforming, and summarizing data to deliver insights in revenue systems. Many of these tasks require a mix of business domain and technical knowledge that can be hard to mobilize. GenAI can facilitate these tasks by bringing in relevant knowledge. For example, GenAI can be used to support the creation of data schemas, SQL queries, or API formats.

More generally, technical users often need deeper access to documentation. GenAI's language capabilities could be used to summarize the pricing system's knowledge base, including to contextualize the answer to a technical question with insights from the customer's current business and usage of the solution. Ex-isting customer configuration can be explained textually, even for sophisticated customers who extensively leverage scripts for their configuration. Beyond expla-nation, a copilot-like application tuned from pricing software vendors' knowledge bases, FAQs and API documentation could help to improve performance, generate documentation, or test cases.

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GenAI does not replace the predictive AI tools we as pricers have become familiar with and already know through AI & ML, but it instead introduces changes in how systems and humans collaborate within the realm of pricing. It unlocks capabilities that were once difficult to access or even inaccessible, thereby augmenting the value of predictive AI.

In short, ChatGPT and other GenAI tools are valuable additions to the AI toolbox of pricing software, not a complete fix or a cure-all.

6. What Really Matters With ChatGPT & GenAI: Execution

AI is a comprehensive process, embracing everything from innovative models to user experience and change management to turn data into long-term impact. In this AI-driven era, companies that recognize this comprehensive nature are the ones that stand out. Successful AI deployment is a coveted achievement, often elusive for many companies, with only behemoth companies like the GAFAM businesses consistently pulling it off successfully. The fundamental groundwork is crucial, not just for AI as a whole, but for every flavor and adjacent application of AI. GenAI and conversational interactions are no exception. Like every other AI, it is not always the most sophisticated algorithms that deliver the most value, but the ones that best fit in their environment.

Succeeding in AI is about a lot more than models & technology

By order of importance, leaders should consider the following factors when applying AI (to pricing & other domains)

1. User Enablement & Change Management

Making model behavior, guidelines, process and limitations clear to stakeholders.

2. Data

Data must be readily available for models to use, & success in AI is directly correlated to quality & quantity of data.

3. System Integration

AI must be integrated in workflows, and easy to adopt: consume, explain, trust.

4. Model Operations

AI-centric systems require ongoing upkeep for data updates, model refreshes, & parameter adjustments.

5. Data Transformation & Data Science Techniques

AI performance hinges on scientists transforming data and business problems to fit models.

6. AI Model Selection

Selecting a suitable model is important to achieve business objectives.

You may notice that this philosophy is not exclusive to AI. It is also a critical success factor in the pricing space, and one that has been at the heart of our success powering pricing with our "Friendly" platform. It is therefore not by coincidence that Pricefx AI Optimization stands apart by focusing on the complete data science environment to maximize long term value and adoption.

The superiority of our SaaS-native platform is also what allows us (and our ecosystem) to make the latest tools and innovations available to our customers. Every AI application, simple or complex, deserves its place in this landscape and should continue to evolve. In this context, GenAI simply becomes another tool in our AI toolbox.

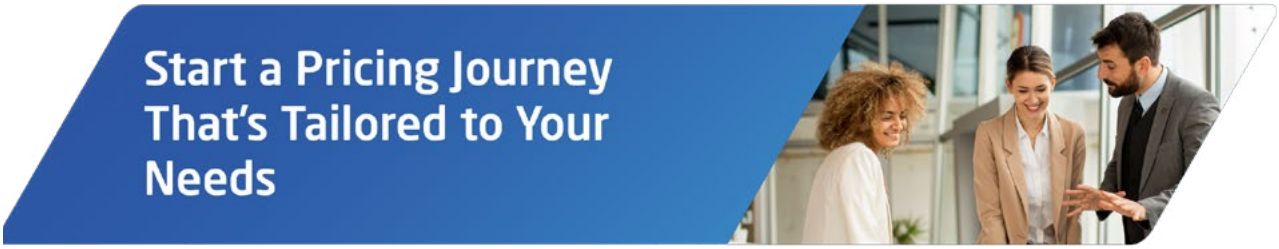
The very core that powers GenAI is not a revolutionary leap; it is more about progressive improvements in quality and the ecosystem surrounding it. This evolution paves the way for new applications across various domains, including pricing. We increasingly see AI capabilities embedded in pricing workflows, and GenAI is one of those AI capabilities that needs to be integrated to be transformative, not just in pricing systems but in the ecosystem as whole. When releasing predictive and prescriptive AI, companies are often keen to control the "level of automation" of the algorithms implemented. They will require many manual reviews in preliminary stages, and gradually automatize the release of an AI's outputs as trust increases over time. However, as GenAI is unstable by nature, it will require even greater levels of human interaction, which can only be achieved through tight integration and user experiences.

Large Language Models (LLMs) come with a significant set of strengths and weaknesses, which must be thoroughly understood by both users and product managers. While GenAI offers remarkable potential in complementing pricing, it is important to note that its application is only optimal in specific areas for the time being which leaves the technology far short of being the perfect 'cure-all' pricing technology. The same rational conclusions apply to AI-powered chatbots, although promising, they may have a precarious future ahead. Consider the cost structure, business model intricacies, legal and copyright concerns, and the paramount importance of user experience. These factors pose substantial roadblocks that could jeopardize the longevity of AI-powered chatbots. However, one thing is for sure: GenAI, like other types of AI, needs a foundation: data, platform, organization readiness, and accurate predictions and recommendations. Therefore, if you want to win the GenAI (or the AI) war, it's time to take ownership of your pricing and your data in a platform that can grow as your grow.

In short, is GenAI ready to take over pricing? No, not yet.

However, in the meantime, Pricefx's vision and recent execution with GenAI, and predictive and prescriptive AI in price optimization underscores our dedication to unleashing the power of AI-enabled pricing solutions for every customer.

Would you like to start a pricing journey that is tailored to your needs with the AI we currently use?



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