



# Generative AI – A Roundtable Discussion – October 2023 Update

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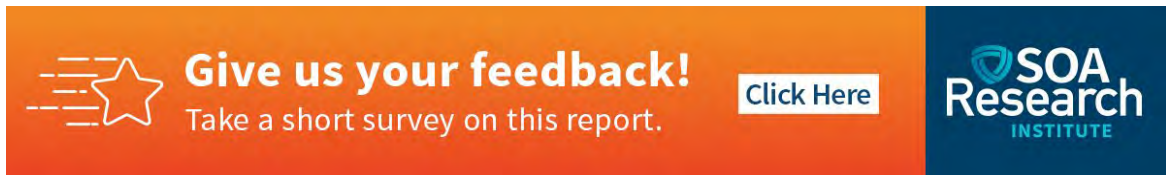


# Generative AI – A Roundtable Discussion

## October 2023 Update

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## Introduction

Advancements in Generative Artificial Intelligence (GenAI) have caught the attention of the entire world over the last 12 months. Although GenAI research has been ongoing for many years, only now that ChatGPT has been made available to the public has it garnered an extensive amount of attention. As the pace of advancement in GenAI increases, many companies are looking at how this technology can be used to improve their processes and employee efficiency. The insurance industry is no exception.

On October 7, 2023, the SOA Research Institute assembled an industry expert panel to discuss current issues in GenAI. The group was diverse in terms of employment, including company actuaries from life, health and property/casualty backgrounds, as well as consultants from various kinds of firms.

This document summarizes the discussion that occurred during the three-hour meeting. To encourage candor during the discussion, participants were assured that this report would not attribute comments to individuals or companies, so no names appear in the body of the report. The names of those who participated are included at the end of the report.

## Executive Summary

The topic of “Generative AI” spurred a lively and varied discussion. Three presentations by experts set the stage for discussion. Topics that generated discussion included:

1. Is GenAI new?
2. Thoughts on GenAI
3. How is GenAI currently being used?
4. Risks
5. Training GenAI as an intern
6. Human in the loop
7. How can the industry use GenAI right now?
8. Scaling AI within a company
9. Training Set and Control Set in GenAI
10. Continued relevance
11. Trusting data from other sources
12. Regulators



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## Section 1: Thoughts on GenAI

To start the discussion, each panelist was asked to provide a short description of their background and give their definition and thoughts on GenAI. Here is a summary of the responses:

Many of the panelists expressed their interest in hearing what the experts had to say about the current state of GenAI, as well as where it might be going. They were also interested in hearing what their peers were currently doing and excited to learn more about how GenAI could be used in insurance tasks. Some of the tasks that they wanted to learn more about included how GenAI could help with: modelling, documentation, code generation, exploratory data analysis, memo preparation, better informing the organizational design, and incorporating Gen AI into model risk management policies and standards.

When asked to define GenAI, some of their thoughts were as follows:

- In insurance, GenAI could primarily drive a step-change in efficiency and quality of tasks by drawing insights from unstructured data and augmented human-led processes with step-by-step coaching in areas such as underwriting and claims
- GenAI is different from previous AI. Previous AI took structured data and found non-linear patterns with the data and then made predictions, while GenAI takes unstructured data and not only makes predictions, but also generates content (creates art, improves coding efficiency, and translates code from older languages to newer languages).

Other questions that panelists were interested in getting answers to were:

- What are the best practices and ethics of using GenAI in actuarial business?
- What are the best ethics from a risk management perspective?
- How can GenAI help us do our traditional actuarial modeling better, faster, cheaper?
- Can actuaries seize this opportunity to play a bigger role in GenAI analytics?
- What are people's thoughts around incorporating GenAI into model risk management policies and standards, and do those things need to change as a result of new models, new model types and new model classes being introduced into the ecosystem?

Other thoughts panelists presented on GenAI were:

- It has the potential to be disruptive.
- It will give us many models where we can use plain language to ask questions of a computer.
- It will give us a way of accessing and summarizing information that we haven't had before.
- It wasn't something that was anticipated to be coming this quickly.
- It's a good intern. GenAI can help you find the nuance that you need.
- It will alleviate some bottlenecks that we currently have in the architecture for actuarial modeling
- If you're using closed source systems, GenAI is not going to be in a position to really help advance your modeling efforts.
- We're going to need intelligent people behind the system so, it will be an accelerant, but it's not going to be a panacea.
- It's an enabler. It's good for efficiency such as building code and documentation, but for modeling, you need accuracy, explanation and a lot more transparency.
- Insurance is lagging behind other sectors in how quickly and widespread it is adopting AI. This could be because it is a particularly risk sensitive and risk mitigating industry.

## Section 2: Presentations

Three presentations were made by experts in the field to set the stage for discussion.

The first presentation was given by a presenter from a very large company that has been developing AI for a number of years. The presenter walked through his company's background in AI and outlined their products for both consumers and enterprises that are available. He also outlined the architecture of the company's tools and how they could be used by insurance companies and incorporated into their data to create their own GenAI models.

The second presentation was given by two presenters from a large management consulting firm. The presenters talked through many topics on GenAI including the risks of using GenAI, how they had seen companies get value out of investments in GenAI, emerging archetypes of impact within GenAI, current uses of GenAI and potential future uses. They also provided use cases for GenAI.

The third presentation was given by a presenter from an enterprise software company that specializes in data warehouses, data lakes and AI. This presenter discussed the areas of maturity that they had seen in GenAI. They also discussed the four main applications that they had seen in the insurance and financial services areas. She also described the process that her company went through to build their own Large Language Model (LLM).

## Section 3: Topics and Discussions

Throughout the presentations and ensuing discussions, many topics were discussed such as the current and future uses of GenAI, the risks, the technology and implementation. The following subsections summarize the discussions.

### 3.1 IS GENAI NEW?

Panelists pointed out that, although generative AI has just become highly visible since 2022, it is not new. Companies have been developing and investing in AI and generative AI for a number of years. Therefore, the tools for GenAI are further along than one might think. There is an increase in the enterprise grade nature of the tools that are currently available. These tools include open source tools, as well as proprietary tools from multiple vendors.

### 3.2 HOW IS GENAI CURRENTLY BEING USED?

#### 3.2.1 CONTENT CREATION

GenAI could be used for customer communication. One expert noted that they're not seeing a lot of carriers allow GenAI tools to speak directly to customers, but always have someone in the middle to mitigate the risk.

#### 3.2.2 CODE GENERATION

GenAI is used quite frequently, and possibly mostly, in code generation. Tools exist that will generate code for common languages such as SQL and Python. Another common use of GenAI in code generation is to have it translate code from legacy languages, such as COBOL, to current languages like Python. Another example noted is translating SQL to R and R to Python. Since open source programming languages, such as Python, are extremely well documented on the internet and there is so much data available, it is easier for GenAI to generate code with the depth and accuracy that it does. It may not be able to generate code so well or easily for closed systems.

One risk outlined with code generation is the possibility that the code it generates is from a protected IP. For example, when generating Python code, it may be using code from a licensed package that your company does not have permission to use or has been identified as a package that contains security risks identified by your IT department. What would be the legal standing of using that code? Is a new kind of license required? That may be a gray area at the moment. It was noted that some GenAI tools allow the user to exclude specific code libraries from the code generation to avoid these risks.

One panelist stated that generating code is easy because there is a lot of documentation and information about code on the internet. However, when providing insights, for example, for a chief actuary, the answer you get will not be the in-depth answer that somebody with 20 years of life insurance experience would give.

#### 3.2.3 VIRTUAL SME

GenAI can help with content generation that interacts with users, whether it's internal or external and helping the users navigate content or answer questions. Searching, synchronizing and summarizing information are things GenAI can be really good at. AI, in general, has the capability of recognizing patterns. Thus, with the proper training, it can be used for pattern recognition and identifying anomalies. Those are things that we actually do as actuaries. One expert had seen a lot of internal use cases on providing employees with user manuals, frequently asked questions and answering tools on their actuarial ecosystem.



### 3.2.4 PROACTIVE COACHING

GenAI can be used to guide humans proactively to become more consistent and accurate on their decisions with real life coaching. One use is to suggest real-time actions to specific situations to improve accuracy and quality, such as “always on coaching on client calls.” On the documentation side, this could be a really good tool for actuaries and financial functions.

### 3.2.5 ACTUARIAL USES

The following subsections outline how GenAI is being applied in actuarial scenarios.

#### 3.2.5.1 *Compliance and Memorandums*

One expert had seen GenAI being used for regulatory compliance. They had also seen it used on actuarial memorandums, or any process that is being done on a frequent basis. It was generally accepted and voiced by many participants that these uses would require human in the loop (see subsection 3.5 below).

#### 3.2.5.2 *Retrieval Augmented Generation (RAG)*

One expert had seen about 60% of the insurance companies that use GenAI apply a technique called retrieval augmented generation (RAG). This technique helps to not only know which documents you need to pull to answer a question, but also eliminates a lot of the fine tuning.

#### 3.2.5.3 *Fine Tuning Your Own Model*

One expert had seen about 20% of the insurance companies that use GenAI fine tuning their own models. They noted that if you want to train your model on life insurance or on actuarial modeling, it needs very specific information.

The expert outlined how much data would be needed to use RAG versus fine tuning models. They explained that if you have 10,000 words, then you have enough data to do RAG and have a customized model for a specific use case. To effectively fine tune your model on your data, you would need millions of words.

#### 3.2.5.4 *Building Your Own Version of ChatGPT*

The expert explained that there are companies that are fully retraining their foundational models and building their own version of ChatGPT, but they hadn't seen insurance companies doing that.

## 3.3 TRAINING GENAI AS AN INTERN

The topic of training GenAI as an intern came up and generated a lot of comments and discussion. One panelist noted that it could be trained as an intern or assistant on your side. Another panelist called this a co-pilot. One expert stated that if you had an actuarial intern, then you would want to make this person a more efficient or better student or intern and, to do that, you would need to invest the time to train them. Therefore, for a tool like GenAI, actuaries would need to invest time upfront to build a model, and get involved very early in the process.

## 3.4 RISKS

A fair amount of time, both in the presentations and the discussions, was taken to identify and discuss the risks of using GenAI.

### 3.4.1 PRIVACY

The use of public applications, such as ChatGPT, could unknowingly leak confidential data. Users in companies were entering private information into ChatGPT, not realizing that the terms of service would allow it to use the

information for further training. Figuring out how to manage the privacy of your data and that of your customers is a new issue that was not needed in previous AI.

### 3.4.2 BIAS

One expert noted that if the model was trained on non-representative data scraped from the web, it would be prone to propagating and amplifying gender, race and other biases present in the training dataset. Multiple panelists expressed concern about the presence of bias in training data. It was asked how you would remove bias from thousands of years of human experience and cultural issues before you felt that it would be reliable? One expert answered by indicating that it's hard because, by definition, if you are trying to set prices that are fair for the minority group, you wouldn't have enough data, so the bias in the model output would be due to a bias in the data input.

The following techniques were discussed on how to combat bias in the model:

- Adjust the thresholds that you have in your model. This is something that can be done in your confusion matrix when you're trying to evaluate false positives, false negatives, and how to optimize.
- Oversample your minority population and place more weights in the accuracy of how you're treating that minority population.
- There are open source libraries that can help to simulate the data and ensure that you get some sort of balance in the data.

### 3.4.3 INTERPRETABILITY AND TRANSPARENCY

One expert noted that GenAI is a complex black box and the lack of foundation model-specific interpretability methods limits the user's ability to understand how outputs are generated. The risk is the undisclosed use of synthetic media. The limited ability to detect AI-generated content erodes trust amongst users. A panelist noted that it would be a problem if we couldn't describe to a regulator exactly what the model is doing and exactly how the black box is performing. It was stated that this limits how fast the industry can move in GenAI since it means that, to have interpretability and transparency, you have to employ a thoughtful approach to where and how to use it to meet that bar. If you're responsible for building or deploying the tool, you should have the enterprise traceability internal to your own data and internal to the way you display it to users, whether they're customers or internal users. On the internal side, it's the sourcing, so that someone can trace where the model is pulling from and check the sources, as well as the human in the loop.

### 3.4.4 PERFORMANCE AND ACCURACY

Multiple panelists and experts noted that one risk on the performance and accuracy side is that GenAI will generate new and wrong things. This is often referred to as hallucination where the content generated will be inaccurate but seem credible. It will give you the wrong answer, but you won't be able to necessarily see or audit it because it's generating content that is wrong in real time. The solution is to have someone in the middle validating the responses.

### 3.4.5 LIABILITY

Liabilities can result from regulatory non-compliance, IP infringement, misuse, bias and undisclosed use.

### 3.5 HUMAN IN THE LOOP

The topic of having real people, such as actuaries, as part of the process of using GenAI is known as human in the loop. The discussion regarding human in the loop was prevalent in many areas, especially when discussing ways to mitigate the risk of errors and incorrect information.

Multiple experts and panelists stated that GenAI is not viewed as capable of replacing all of the work that actuaries perform, but it can best be used to augment human-led processes. It was felt that this is especially true in actuarial work since there is a lot of judgement and strategy required. Using a human in the loop is important for auditing what GenAI creates. One example provided was how GenAI might be useful in summarizing rate filing patterns in P&C. This example takes publicly available previous Department of Insurance (DOI) refiling records that would fit into a GenAI model. The GenAI model processes those refilings and generates output detailing trends and the synthesis of what the rich options are.

One panelist noted that a big untapped resource of competitive intelligence was rate filings. They're public through DOI, but they're incredibly complex, hard to read and, if you're using them for competitive intelligence, you wouldn't have time to read all 500 pages of 20 or 30 different carrier submissions, and then summarize all the insights. GenAI can actually be quite powerful at tapping those insights. One other point that was mentioned was that traceability is key. In each summary that GenAI produces, it points to a specific source so, instead of going through all 500 pages of the rate filing, you could flip to the exact clause on the exact page to see where that insight came from. This provides a way of taking the black box nature of some of what GenAI produces and actually making it a lot more transparent and traceable.

One panelist asked the experts whether the future was going to be more like "We don't use ChatGPT, but we use this contained whatever GPT that has only these rate filings like hundreds of public documents." Their answer was Yes.

Another example provided was an experiment that was conducted to see if GenAI could pass actuarial exams. The person conducting this experiment found that, for the lower-level exams, GenAI passed easily. However, it could not pass the upper-level exams due to the critical reasoning questions. In their opinion, this demonstrated that actuaries' jobs are secure and we should be embracing this technology.

One panelist indicated that's been their experience because domain knowledge, intelligence, or the wisdom around domain knowledge is extremely important to build to get insights from documents. The notion that AI is going to replace humans is not true for this precise reason because you need a smart person to ask the right questions and train the model to get the right answers.

### 3.6 HOW CAN THE INDUSTRY USE GENAI RIGHT NOW?

One question that arose multiple times was how the insurance industry could use GenAI right now and how a company could get started if they hadn't started already.

Multiple experts pointed out that there are many software and consulting companies that have a generative AI model that insurance organizations can use. In these cases, the insurance company could place their own information in a protected area of the vendor's software so that it does not leak and stays private. The AI model would then combine the company specific data with the vendor's general data to train and use the model for the insurance company's exclusive use.

One expert explained that how a lot of LLMs work is to have a private entrance into it where you can load your private information. It is retained, but you have the benefit of not having to build the LLM yourself. You're not building your own large language model from scratch, you're using something created by a vendor. They've built it and trained it on huge amounts of information, so you don't have to develop that part, but you are locking it behind

a door so that the data you add cannot be accessed by anyone else. Right now, that's how most companies are doing it and there are tons of vendors and solutions that have that type of setup. A panelist also noted that there are open source applications that a company can use to build their own LLM.

Another panelist questioned whether it was a good idea for a company to purchase an LLM that is not pre-trained. They could feed the model a bunch of internal documents and then, in a weekend or a week or two, they could train the model to get some reasonable results. Since they would be building it themselves, there wouldn't be leakage. The answer to this question was that it is possible, but it would not be an easy task since there is not just the training phase, but also the fine-tuning phase. That's where you would need people who know what documents to fit. You would have to think about cross-functional teams. You would need IT. If you're doing it for any of the processes within actuarial modeling, you would need a person who knows the process very well. You would potentially also need data scientists.

An expert noted that companies are building smaller models designed for specific tasks or areas within the business rather than a more generic model intending to encompass everything.

Another expert stated that part of the transformation in your own institutions and, therefore, as an industry is coming up with a plan, an approach and a protocol for managing all of this relatively early in the process. What we've seen is those who go slow to go fast end up going much farther and faster than those who decide to try a bunch of experiments.

A panelist stated that, because most of the value comes from human in the loop processes, it would be a requirement to train several humans on how to do their jobs pretty fundamentally differently. That's not a simple process. One must realize that thinking ahead is required to determine how to get the most value out of a particular model, then working backwards to include the correct people in the development of the model, training, and messaging around how the Company's use of AI would or would not influence job roles and tasks. This is critical because, the more you can build trust and alignment with the folks who are going to be impacted by the models, the smoother it will go.

### **3.7 SCALING AI WITHIN A COMPANY**

A panelist asked how AI could be scaled up within a company. One expert related their experience on how this could happen. They had seen it begin with different departments and executives who ran pilots throughout the company on their own. As the number and size of these pilots grow, it becomes large enough that the organization realizes it needs to centralize. A center of excellence is usually developed to centralize and regulate it within the organization and develop a roadmap. As the roadmap is created, each department becomes accountable for the AI delivery in their own area.

### **3.8 TRAINING AND CONTROL SETS IN GENAI**

The idea of training and control sets, which are common in current AI models, and how they pertain to GenAI, was discussed. A number of questions were asked and a large amount of discussion was generated. The following summarizes the question and discussion around the topic.

One panelist noted that when actuaries are taught about building models, there is a training set and a control set. With generative AI models, the control set becomes smaller and smaller throughout the process. You put in a prompt, get a response, and that's added to your training set, which means it's no longer eligible for your control set. How can you best manage a training set and a control set within the AI landscape?

The notion of train versus control versus test is actually a difficult thing to think about. You almost have to think about it in terms of real time validation. Having it do what it's going to do with the prompt that it's given, and then

having the user, whoever the human in the loop is, answer the question “was this helpful,” “was this not helpful” or be able to track what ends up happening. The model provides some sort of response. Then, the human either does what the model suggested or does something else and, if the human does something else, we need to be able to capture why. The answer is less directly in the data and the question of splitting train versus test versus control, and more in how do you actually wire the use case with the human in the loop to give feedback to the model? If you wanted to backcast in that framework, imagine you have a data set that is 100 records long times 1,000 per row. You train the model on the first 60, then iterate over the remaining 40, give it an opportunity to predict, and you tell it which of those predictions are good. That actually creates the loop of incremental update to the model weights so that each new experiment, from its perspective, is going to perform better. It's ever evolving and many times the answer is not GenAI.

### 3.9 CONTINUED RELEVANCE

A panelist asked if there was anything that could be done on the AI side if the model had been trained and, subsequently, the rules changed, for example with IFRS 4 versus IFRS 17. One expert did not have an answer about how that would work, but commented that sufficient comparative filings would be needed where you could eventually say, “Here's IFRS 4 and here's IFRS 17.” At that point, the current technology might be able to produce some information, but the user should be highly suspicious of the output that it would generate. They felt this was definitely a place where you would want the human in the loop to intervene with the machines.

### 3.10 TRUSTING DATA FROM OTHER SOURCES

A question was asked by a panelist regarding being able to trust data from other sources. How would you know whether policyholders are using GenAI to identify ways to game the policy and keep it in the money? One panelist indicated that's where things become more risky, and didn't think there was a good answer. They added that, whether you're receiving information from a customer or some other third party, they didn't know of any reliable way to audit it to make sure that whatever has been received is human generated and not AI generated.

### 3.11 REGULATORS

The topic of regulators and AI came up. Multiple panelists questioned whether regulators would consider GenAI or even use it themselves since they are usually understaffed. One panelist mentioned that they attended a conference on regulation and there were topics covering the use of GenAI. They thought that regulators were making sure that they kept up to date on this technology, whether it's AI or simple analytics. One panelist mentioned that as standards and practices evolve, they should evolve to make use of some of this technology. Another panelist asked if anyone thought we would ever reach the point where GenAI would be used by carriers to generate compliance filings, and then regulators could use GenAI to analyze the filings and all of this would happen without human interaction in-between. A panelist answered if you're going to use these tools, you need to understand what they do and ultimately take responsibility for them just like you would for an underling or somebody who was working on your behalf.

## Section 4: Questions for the Panelists

Part of the discussion was getting feedback directly from the panelists on what was happening within their own organizations. The following are questions asked directly to the panel and the answers shared by some of them.

**Question:** How many companies are using GenAI in their company for work or experimentation?

- A total of 8 panelists stated that their companies used GenAI.

**Question:** How many companies are using it in actuarial processes?

- A total of 4 panelists stated that their companies used GenAI in actuarial processes.

**Question:** What is stopping your organization from experimenting?

- One panelist indicated a culture of risk aversion. The company made a very blanket statement that it could not be used for business purposes unless specifically approved. Employees must have every specific use case approved.

**Question:** Who in the organization is driving AI?

- One panelist answered data science and IT. The panelist mentioned that their company has a pretty strict policy and were being really careful about which use cases to move forward with. They're trying to be very cautious and paying close attention to how GenAI is rolled out. The things the company had started experimenting with were code completion to make their developers more efficient, which was primarily being led through an IT architecture group. They were also working closely with their data science group on doing things that are more interesting than just code completion. For example, they're creating a knowledge-based chat bot using documentation on SharePoint and other places.
- Another panelist indicated that, while it was actually IT, it's really being driven more by their customer service area.

**Question:** Do you have any successes to share?

- One panelist said they had done a lot of things in code generation, but didn't trust what it generated. They indicated it would get you 80% to 90% of the way there, but then needed somebody to tweak it. It's a huge time saver, but they couldn't just take what it gave them and trust it because it would probably not do exactly what was desired. It must be used the right way. The software developer could not be replaced with it, but it could make the existing developers a lot more efficient.
- Another panelist answered that they were getting 70% to 80%, but it's much better than doing it from scratch.
- Another panelist indicated that generating code to solve a problem or commenting on the code to support the developer or translating code from one language to another was successful. However, trying to get insights from technical documents had provided no value.

**Question:** How is your company handling the risk?

- One panelist said their Chief Risk officer had a town hall to identify the use cases that they would use for AI. They were creating a group to focus on those use cases and investigate the methods, procedures, tools and technology. Their concerns were to not expose the data and to account for bias



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## Section 5: Acknowledgments

The researchers' deepest gratitude goes to those without whose efforts this project could not have come to fruition: the Project Oversight Group for their diligent work overseeing, reviewing and editing this report for accuracy and relevance.

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## About The Society of Actuaries Research Institute

Serving as the research arm of the Society of Actuaries (SOA), the SOA Research Institute provides objective, data-driven research bringing together tried and true practices and future-focused approaches to address societal challenges and your business needs. The Institute provides trusted knowledge, extensive experience and new technologies to help effectively identify, predict and manage risks.

Representing the thousands of actuaries who help conduct critical research, the SOA Research Institute provides clarity and solutions on risks and societal challenges. The Institute connects actuaries, academics, employers, the insurance industry, regulators, research partners, foundations and research institutions, sponsors and non-governmental organizations, building an effective network which provides support, knowledge and expertise regarding the management of risk to benefit the industry and the public.

Managed by experienced actuaries and research experts from a broad range of industries, the SOA Research Institute creates, funds, develops and distributes research to elevate actuaries as leaders in measuring and managing risk. These efforts include studies, essay collections, webcasts, research papers, survey reports, and original research on topics impacting society.

Harnessing its peer-reviewed research, leading-edge technologies, new data tools and innovative practices, the Institute seeks to understand the underlying causes of risk and the possible outcomes. The Institute develops objective research spanning a variety of topics with its [strategic research programs](#): aging and retirement; actuarial innovation and technology; mortality and longevity; diversity, equity and inclusion; health care cost trends; and catastrophe and climate risk. The Institute has a large volume of [topical research available](#), including an expanding collection of international and market-specific research, experience studies, models and timely research.

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