

## **Chapter X.**

# **APPLICATION OF ChatGPT IN INSURANCE**

ChatGPT originated from OpenAI, a startup from San Francisco. OpenAI was founded as a non-profit organization at the end of 2015 with the aim of developing a model of general artificial intelligence that would benefit humankind simply and safely. The company was started by Sam Altman and Elon Musk along with a group of young engineers consisting of Ilya Sutskever, Greg Brockman, Wojciech Zaremba, and John Schulman. The company received initial funding of 1 billion USD from its founders and other investors. Over time, OpenAI has evolved into an important AI research center, with employees coming from the world's largest universities and companies, including MIT, Stanford, Google, and Facebook.

The company started with enthusiasm and already in 2016 became famous around the world when their algorithm AlphaGo beat the world champion in the game Go, Lee Sedola, in a series of five matches. AlphaGo was the first program to beat a professional Go player in a match with a lot of variables, and the victory showed significant progress in the development of artificial intelligence. In the same year, the company announced two other important achievements in this field. A beta version of the OpenAI Gym, learning research platform has been released, as well as a software platform for measuring and training general artificial intelligence in offering games, websites, and other applications on the market, Universe.

OpenAI continued its development in the field of NLP and 2018 published the first GPT algorithm GPT-1 (Generative Pre-trained Transformer 1). GPT-1 is trained on a huge amount of text from a variety of sources, including internet articles, books, and magazines. More than 8 million websites participated in the training. Compared to later GPT models, the GPT-1 has fewer parameters and less ability to generate text, but it was an important start in the development of the GPT series of algorithms. In February 2019, an improved version, GPT-2, was released, which has a greater ability to generate text and a significantly higher number of parameters and layers of the neural network than GPT-1. It was trained on a larger dataset which helped it to better generalize unfamiliar examples. It was also better at solving different logical tasks.

However, very quickly it turned out that it was almost impossible to develop such a technology without a constant influx of a large amount of money. In

2019, OpenAI changed over from a non-profit to a profit-making organization with limited profits and thus created a new company OpenAI LP. The company distributed capital to its employees and partnered with Microsoft, which announced an investment of 1 billion USD. In June 2020, the third version of the GPT-3 algorithm was released, which has a much higher number of parameters than GPT-2. This means that it has a higher capacity for processing data and creating responses. GPT-3 has 175 billion parameters compared to GPT-2 which has 1.5 billion parameters. Since November 2022, ChatGPT-3 services have been available to the public through several applications and platforms. The main novelty in the GPT-3 algorithm is the ability to generate human-like texts, which can often be used in various applications such as chatbots, translators, and other programs that use natural language.

## **1. CHATGPT-3, INTRODUCE YOURSELF!**

For a technological innovation to experience mass application, it is not enough just to be well implemented. It is necessary, perhaps even more important than quality, to be easily accessible and fun. That's what the ChatGPT-3 platform has right now. To present this chatbot, it is interesting to use what it can say about itself.

By asking the question: "Can you introduce yourself?", the following response is obtained: "Of course, I'm ChatGPT, a large language model developed by OpenAI. My main task is to provide answers to users' questions through natural language. My work is based on deep learning and NLP technology. In my work, I use a huge set of data and machine learning algorithms to analyze user questions and provide an answer in the best possible form. Together with other language models like mine, my goal is to help users solve different problems and meet their information needs."<sup>1</sup>

ChatGPT is a model that is trained to communicate conversationally. The dialog format allows ChatGPT to answer additional questions, admit its mistakes, challenge incorrect premises, and reject inappropriate requests. One of the key features of ChatGPT is its ability to generate responses that are consistent with the context of the conversation. This means that the model is able to understand the flow of the conversation and generate responses that naturally fit with what has been said previously. This conversational model is able to cope with a wide range of questions and accompanying sub-questions without losing context.

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<sup>1</sup> chat.openai.com

It is available in almost all languages. The communication can be established in different languages, although the chatbot actually "thinks" in English, and then uses well-developed translators so that it interprets the input and output information in the desired way of the user. If we were to address him in Serbian with the question: "What is the language in which we communicate?", the answer would be: "We are currently talking in Croatian. However, if you wish, I can answer you in any of the many languages I support. Just tell me what language you want us to talk in." If it were to receive the following request: "In Serbian", chat GPT-3 would reply: "Of course, we can talk in Serbian. How can I help you today?" It is also interesting to answer a more complicated question in this context: "Do you know the difference between these two languages?", ChatGPT-3 can do fine and prepare a correct answer: "Serbian and Croatian are very similar, and they are so related that they are often called Serbian-Croatian language. However, lately, there has been a tendency to distinguish these two languages as separate languages, based on different historical, political, and cultural contexts. There are differences in some grammatical rules and some words, pronunciation, and spelling, but generally speaking, people from Serbia and Croatia understand each other without any problems."

## **2. HOW DOES ChatGPT WORK?**

Since the release of ChatGPT-3, the public has been exploring the capabilities of this chatbot. Although the details of its inner workings have not been published, its principles of functioning can be understood from some published research. Basically, there are multilayered neural networks that are trained in deep machine learning algorithms. The name GPT describes the basic concepts of this algorithm: G (Generative) means that it is capable of generating text, and not only of understanding it and giving results in the form of predefined sequences, P (Pre-trained) indicates that the model was trained on a large set of textual data before finally being set up for specific tasks, while T (Transformer) is the type of artificial neural network on which this program works.

### **The Large Language Models**

Unlike traditional NLPs (Natural Language Processor) models that rely on handmade rules and manually tagged data, ChatGPT belongs to the class of LLM (Large Language Model).<sup>2</sup> LLMs can process vast amounts of text data and establish relationships between words in the text. These models have

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<sup>2</sup> Menor D. (2023). *Veliki jezički modeli: sve što trebate znati.* <https://hashdork.com/bs/veliki-jezički-modeli/>

advanced over the last few years thanks to advances in computing power. LLMs strengthen their ability as the size of their input datasets and coaching algorithms increases.

Picture 1. Predicting a next word and a masked word

<b>Next token prediction</b>	<b>Masked language modeling</b>
The model is given a sequence of words with the goal of predicting a next word	The model is given a sequence of words with the goal of predicting a masked word
Example:	Example:
Hannah is a _____	Jacob ( <i>mask</i> ) reading
Hannah is a <i>sister</i> Hannah is a <i>friend</i> Hannah is a <i>marketer</i> Hannah is a <i>comedian</i>	Jacob <i>fears</i> reading Jacob <i>loves</i> reading Jacob <i>enjoys</i> reading Jacob <i>hates</i> reading

Source: Ruby M. (2023). *How ChatGPT Works: The Model Behind the Bot*  
<https://towardsdatascience.com/how-chatgpt-works-the-models-behind-the-bot-1ce5fca96286>

The most basic training of language models involves predicting words in a series of words. Most often this is seen as predicting the next element and modeling the masked element. In this basic sequencing technique, which is often applied through a long-term memory model (Long Short Term Memory = LSTM), the model fills the gap with the most statistically probable word, relative to the context. There are two main limitations to this modeling as it is shown in Picture 1:

- The model is not able to understand that some of the surrounding words have more important impact than others. In the above example, while “reading” is most often associated with “hating”, in the database “Jacob” can be such a passionate reader that the model should assign a greater value to the word “Jacob” than the word “reading” and choose “loving” instead of “hating”;
- Input data is processed individually and sequentially, not as a whole. This means that when the LSTM is trained, the context window is fixed and it can only know about a few steps in a series of individual entries. This limits the complexity of the relationship between words and meanings that can be derived.

In response to this question, in 2017 the team at Google Brain introduced transformers. Unlike LSTM, transformers can process all input data at the same time. Using the self-attention mechanism, the model can give different weights to different parts of the input data relative to any position of the language sequence. This function brought improvements in the field of LLM and enabled the processing of significantly larger datasets while defining a much wider field of parameters.

## Self-Attention Mechanism

Self-attention is the ability of an algorithm to understand the context it needs based on a forwarded sentence.<sup>3</sup> The system works by assigning a "query" to each word in the sentence and then comparing these queries with "keys" (also derived from the word in the sentence) to find the most relevant information. The algorithm then combines this information, weighted by its relevance, to create a contextual representation of each word in the sentence. Proper context setting is key to understanding and creating a natural language. In its basic form, self-attention does not take into account the order of words in a sentence. To achieve this, additional position-based information is added to word representations, which helps the algorithm understand the order and layout of words. Self-attention architecture is a powerful method for language processing, as it allows a computer program to understand and analyze the context of words within a sentence.

The self-attention mechanism uses the following three matrices to help the system understand and process the relationships between words in a sentence:

- **Query (Q):** This matrix represents the observed word for which the context is determined. By transforming the representation of words, using a query matrix, the system generates a query vector to be used for comparison with other words in the sentence;
- **Key (K):** A key matrix is used to create key vectors for all words in a sentence. These key vectors help the system measure the relevance or similarity between the words in focus (using the query vector) and other words in the sentence. A higher result of the similarity between the query vector and the key vector indicates a stronger relationship between the corresponding words;
- **Value (V):** A value matrix generates value vectors for all words in a sentence. These vectors contain contextual information about each word. After calculating the similarity results, using the query and key vectors, the system calculates the weighted sum of the value vectors. The weights for each value

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<sup>3</sup> [www.linkedin.com/pulse/gpt-4-explaining-self-attention-mechanism-fatos-ismali](https://www.linkedin.com/pulse/gpt-4-explaining-self-attention-mechanism-fatos-ismali)

vector are determined by the results of the similarity, ensuring that the final contextual representation is more influenced by the relevant words.<sup>4</sup>

## **Multi-Head Self-Attention**

Multi-head self-attention is a type of attention mechanism that involves the parallel use of multiple self-attention mechanisms.<sup>5</sup> In transformers, multi-head attention is used to allow the model to process the input token sequence in multiple layers or heads simultaneously. Each head processes the input string of tokens and pays attention to different aspects of the sequence, which allows the model to learn different properties of the input and use them in its calculations. The outputs of the different heads or layers are then joined and passed through the linear layer to produce the final output. The purpose of using these models is to allow the algorithm to deal with different aspects of the input sequence at different levels of granularity.

In the transformer model, multi-head attention is applied to all three sequences: query, key, and value. Each self-attention mechanism processes these three sequences in different ways and produces the output used to calculate the final output. Multi-head attention allows the model to focus on different aspects of sequential data and to learn the complex dependencies between them. This often leads to better performance in natural language processing tasks, such as machine translation or text generation.

## **How does ChatGPT learn?**

The creators used a combination of supervised learning and reinforcement learning to fine-tune ChatGPT, but it's the reinforcement learning component that makes ChatGPT unique. Developers use a special technique called Reinforcement Learning from Human Feedback (RLHF), which uses human feedback in a training round to minimize harmful, untrue, and/or biased results.

Classic Reinforcement Learning (RL) algorithms use rewards and penalties that an agent receives from the environment as feedback on how they should behave. However, this type of learning is not always effective, because rewards are often rare, and an agent can spend a lot of time trying to figure out what to do. At RLHF, people who work with an agent provide him with detailed guidance on how to behave in different situations, rather than the agent having

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<sup>4</sup> [vaclavkosar.com/ml/transformers-self-attention-mechanism-simplified](https://vaclavkosar.com/ml/transformers-self-attention-mechanism-simplified)

<sup>5</sup> Ghojogh B., Ghodsi A. (2020). *Attention Mechanism, Transformers, BERT, and GPT: Tutorial and Survey*

to discover the best behavior on his own. This approach allows for faster learning and fewer behavioral errors. For example, in robot training, a person can directly control the robot to show which actions are best in a given situation. This process is called “demonstration” and allows the agent to learn from experience and increase their efficiency in solving tasks.

### **3. APPLICATION OF ChatGPT IN INSURANCE**

Insurance is an activity with weak and rare interactions with clients. In addition to the very nature of the process, to buy and pay the policy at the beginning of the contract and then during the term of the contract there is no communication with the insured if there are no claims, there are also brokers, who often take over the complete communication with clients. Lower digitization than in other industries makes it difficult for insurers to interact with customers. One of the biggest challenges of the insurance industry that artificial intelligence could solve is more intensive communication with existing clients and communication with potential clients at the right time when they need insurance services.

One of the most significant trends in the insurance industry is the increased use of artificial intelligence and machine learning. AI is already used to automate many routine tasks, freeing up time and resources for more complicated jobs. For example, some insurance companies use artificial intelligence to automate risk-taking processes, allowing them to make more accurate risk and price decisions.<sup>6</sup> AI is also used to improve claims processing and fraud detection. One of the most well-known realized examples of AI in practice, which is used everywhere, including insurance companies, is a chatbot.

Using ChatGPT in the insurance industry can help improve efficiency, reduce costs, and provide better customer service. However, it is important to note that the technology is still at an early stage. Its impact on the industry will depend on how it is adopted and integrated into existing processes.

#### **The Impact of ChatGPT on Occupations and Industries**

To better understand how the expansion of ChatGPT technology will affect occupations and industries, the methodology developed by Felten and his associates. They have created a measure for occupational exposure to the influence of artificial intelligence (AIOE - Artificial Intelligence Occupational

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<sup>6</sup> Pavlović, B. (2022). *Artificial Intelligence in Insurance*. XX međunarodni simpozijum „Osiguranje na pragu IV industrijske revolucije“, Arandjelovac

Exposure) and used this measure to identify which occupations are most exposed to AI. The term exposure is used to be comprehensive in terms of the effects of artificial intelligence on the occupation, which encompasses the full range of impacts, from replacing the occupation with artificial intelligence to increasing the demand for the occupation, depending on various factors related to the occupation itself.

The AIOE measure is constructed by connecting 10 areas of use of artificial intelligence (abstract strategy games, real-time video games, image recognition, visual answering of questions, image generation, comprehension of the read, language modeling, translation, speech recognition, and instrumental trace recognition) with 52 human abilities (oral understanding, oral expression, inductive reasoning, hand stability, etc.) using a matrix indicating the level of connection between each application of AI and human abilities. AI application data comes from the U.S.-based non-profit organization Electronic Frontier Foundation (EFF),<sup>7</sup> which collects and maintains statistics on AI progress across multiple applications. Human Abilities Data comes from the public free Occupational Information Network (O\*NET)<sup>8</sup> database developed by the United States Department of Labor. O\*NET uses the aforementioned 52 human abilities to describe each of the over 800 professions it follows. Each of the professions can be considered a weighted combination of 52 human abilities. O\*NET uses two sets of weights: prevalence and importance.

*Table 1 Ranking of occupations by exposure to artificial intelligence*

<b>Number</b>	<b>Occupation</b>
1	Genetic counselor
2	Financial examiner
3	Actuary
4	Purchasing agent, except in wholesale, retail, and agriculture
5	Budget Analyst
6	Judge
7	Procurement clerks
8	Accountant and auditor
9	Mathematician
10	Court Clerk

*Source: Felten, E., Raj, M., Seamans R. (2023). How will Language Modelers like ChatGPT Affect Occupations and Industries? arXiv preprint, arXiv:2303.01157*

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<sup>7</sup> [www.eff.org](http://www.eff.org)

<sup>8</sup> [www.onetcenter.org](http://www.onetcenter.org)



In their work, Felten and associates<sup>9</sup> explain in more detail the construction of AIOE results and describe how they can be weighted at the industry level to construct the result of AI industry exposure. They also provide results from many validation exercises and describe several ways in which scientists and practitioners can use the results. Table 1 shows a list of the 10 occupations most exposed to AI based on the original Felten AI Occupational Exposure Measure (AIOE), while Table 2 provides a list of the 10 industries most exposed to AI based on the original Felten AI Industry Exposure Measure (AIIE - Artificial Intelligence Industry Exposure).

*Table 2 Ranking of activities by exposure to artificial intelligence*

<b>Number</b>	<b>Occupation</b>
1	Financial investments
2	Accounting and wage calculation
3	Insurance and employee benefit funds
4	Legal services
5	Agencies, brokers, and other activities related to insurance
6	Credit intermediation
7	Investment funds
8	Insurance companies
9	Software companies
10	Lessors of nonfinancial intangible assets

*Source: Felten, E., Raj, M., Seamans, R. (2023). How will Language Modelers like ChatGPT Affect Occupations and Industries? arXiv preprint, arXiv:2303.01157*

The first list tops the actuary, while the second list is where the insurance industry is most prevalent. In further work, the impact of ChatGPT on the job of the insurance sales agent and the entire insurance activity will be analyzed in more detail.

## **Improvements that ChatGPT brings for Insurance Agents**

As insurance technology continues to evolve, insurance agents must follow modern technological trends, which include the adoption of new tools and methods to improve their business. ChatGPT, a state-of-the-art language model,

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<sup>9</sup> Felten, E., Raj, M., Seamans, R. (2021). Occupational, industry, and geographic exposure to artificial intelligence: A novel dataset and its potential uses. *Strategic Management Journal* 42(12), p. 2195-2217.

has the potential to revolutionize the insurance industry by providing a wide range of services that make agents' lives easier. Agents can benefit from the use of this technology as follows:

- **More efficient customer service** - Insurance agents and companies can use ChatGPT to create customer support responses. According to the Opus Research Report<sup>10</sup>, only about 35% of customers want to communicate with chatbots, while about 48% of clients declare that they don't care if they get answers from a human or an automated chatbot. ChatGPT has become so adapted to the human way of communication that it can generate texts that look like they are written in natural human language;

- **Business operations automation** - ChatGPT can do much more than provide customer support. From risk-taking and claims processing to policy management, it's a great tool for insurance agencies to simplify their operations. With the help of ChatGPT, companies can automate boring processes such as approvals and estimates with accuracy that does not require human intervention, resulting in better efficiency while saving time and money;

- **Support for more accurate risk assessment** - Insurance agents do their best to accurately assess risks and offer competitive prices, but sometimes they have to ask for help. This is where ChatGPT comes in, which, using a huge amount of data, can provide more accurate estimates that help all stakeholders. Customers thus get better insurance coverage at an appropriate price, while accurate risk assessments can help agents in the efficient processing and better handling of customer requests;

- **Preparing social media posts** - writing content on social media is often not so strong point for independent insurance agents. But in today's digital world, social media posts have become an essential promotional tool. So, successful agents need to write content for their Facebook, Instagram, and LinkedIn profiles. Fortunately, using ChatGPT, agents can quickly and easily create all the necessary content, which has a satisfactory quality;

- **Email marketing** - ChatGPT can help with marketing by generating personalized email content. It can also analyze customer data and suggest target segments for campaigns. In addition, ChatGPT can generate product titles and descriptions for promotional emails, improving overall marketing effectiveness. By automating repetitive tasks, ChatGPT can help save time and resources for insurance agents while delivering high-quality results;

- **Automating routine marketing tasks** - ChatGPT makes it easy to get the most out of your insurance marketing strategy. It helps automate routine tasks such as generating and sending targeted emails. Also, by supplying ChatGPT with customer information, such as previous purchases, demographic data, and

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<sup>10</sup> Agency Height. (2023). *How Successful Insurance Agents Can Leverage ChatGPT In 2023*. <https://www.agencyheight.com/chatgpt-for-insurance-agents>

preferences, ads tailored to each customer can be generated and delivered at the right time;

- **Data analytics** - ChatGPT can collect and analyze customer data to provide insight into customer preferences and behavior, allowing agencies to make informed decisions and improve their offerings.

## Options for applying chatbots in insurance

Generic AI models can be cleverly combined with models trained on internal data. This provides the ability to expand topics specific to the local domain with a greater understanding of the language and better specifying the topic. That's why insurers will need to improve their data management and invest in other technologies such as voice recognition and text conversion to get more contextual data to train GPT algorithms. Technology should be embedded in business processes to ensure that people train, adjust, monitor and control algorithms.

The most common examples of using ChatGPT in insurance are:

- **Chatbot**: ChatGPT can be used to create a chatting AI software robot<sup>11</sup> that can answer customer questions, provide information and perform tasks naturally and humanly;
- **Virtual Assistant**: ChatGPT can create a virtual assistant to help users with tasks, provide recommendations and perform other functions;
- **Text Generation**: ChatGPT can generate text, such as product descriptions, headings or summaries, based on specific queries or entries;
- **Answering questions**: ChatGPT can be used to answer questions naturally and humanly based on information from a database or other sources.

ChatGPT will have a huge impact on the business and effectiveness of the customer center. It is expected that over a period of two to three years, it will probably double or even triple their productivity.

The process of taking risks depends largely on data and statistics. The more the risk taker knows about the risk, the greater the possibilities for statistical analysis of the probability and severity of the potential loss, i.e., for a more adequate determination of the risk price. AI promises to significantly increase the efficiency of comparison, synthesis and transmutation of vast amounts of raw, relevant data into forms that can be used by insurers.

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<sup>11</sup> Pavlović, B. (2019). *Robot Usage in Insurance*. XVII međunarodni simpozijum „Osiguranje na pragu IV industrijske revolucije“, Zlatibor

In terms of knowing the risk and its presentation, ChatGPT potentially changes the game. For some types of insurance, increased access to publicly available information, offered by artificial intelligence, may render the insured's obligation to provide risk information completely redundant.

There is a lot of talk about the use of AI technology in communication with customers, and insureds are no exception. There is certainly room for ChatGPT technology to perform basic interactions with customers at the time they decide to terminate their policies or want to report claims. This may include generating policy and claims documents, as well as answering questions about the process of reporting claims or requesting termination of the policy.

Finally, the ability to analyze data and detect patterns can provide a useful tool for insurers in detecting fraud. This could be of real benefit to the industry – not only for insurers but also for insureds whose premiums can be reduced if insurers can reduce the amount which they pay based on claims that did not occur.

## **Challenges in the application of chatbots in insurance**

Although the future of insurance looks bright with many opportunities for growth and innovation, there are numerous challenges that the industry has to cope with. One of the biggest challenges is the following of modern digital technologies that are developing very quickly and whose implementation brings new challenges.

Among the problems that arise in the use of GPT technology, it is important to emphasize the issue of this web application capacity if mass exploitation begins. Also, ChatGPT has been observed to have miscommunication in the areas of racism, sexism, or political issues. It also has a tendency to fill the answer with incorrect information if it does not have relevant facts. The algorithm was trained over the data until September 2021, so the information that appeared after that is not known to this model. The company that manages the development takes care of the quality of the information that the software is "fed", so it is not possible to learn based on everyday posts that appear on the Internet or that people place on ChatGPT.

A major US reinsurance company, the Reinsurance Group of America (RGA),<sup>12</sup> recently identified the following limitations that ChatGPT and other language

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<sup>12</sup> [www.rgare.com](http://www.rgare.com)

models have at the moment of the development of GPT technology, in the context of insurance:

- They are trained in large amounts of text from the Internet, which may contain prejudices and may lead to the model reproducing biased language and stereotypes;
- They lack common sense knowledge, which can lead to meaningless or unrealistic answers;
- They can get stuck in tasks that require knowledge of specific subjects or industries;
- Not designed to perform tasks that require reasoning and logical thinking, such as deduction and induction;
- They lack empathy and cannot understand and respond emotionally to context.

From the insurer's perspective, the value of the analytical capability of AI technology is significant, but not decisive. If you ask insurers if their discipline is science or art, they'll probably say it's both. Brokers, insurers, and insureds will not easily abandon human interaction, because it is important to gain confidence in those who control or manage the risks that are taken and to possibly identify the so-called "moral hazard".

It may not be too far the day that insureds apply online to insurers for home and motor vehicle insurance policies, and then the insurer generates them fully through the AI technology platform without any human involvement.<sup>13</sup> The bulk of the debate in this regard is likely to be centered around insurers and their regulator's oversight of technology-driven processes and controls needed to make them robust. It is unlikely that, at the current stage of technology development, ChatGPT will be able to completely replace the employees of the insurance company. ChatGPT has a significant list of shortcomings. It cannot comprehend the context or nuances of human communication, such as sarcasm, it has limited ability to cope with multiple tasks, and has lack expertise to produce complex or technical documents.

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<sup>13</sup> Gerber, D., Terracall, L., Hawke, F. (2023). *The use of AI in insurance: When will the hype become help?* Clayton Utz. Australia.  
<https://www.claytonutz.com/knowledge/2023/february/the-use-of-ai-in-insurance-when-will-the-hype-become-help>

## **4. EXAMPLES OF APPLICATION OF CHATGPT IN INSURANCE IN PRACTICE**

### **Technology platform for insurance and health care services Waterdrop**

The Waterdrop technological platform has internally tested the ChatGPT-based function, intending to apply it to marketing and services in insurance.<sup>14</sup> Founded in 2016, Waterdrop aims to provide access to insurance and healthcare to millions of people through advanced technology.

Huang Mingxing, Waterdrop's AI Business Manager, believes that the key to implementing intelligent chat robots in insurance is to train them with a huge amount of data on insurance products and dialogues with customers in insurance sales, insurance risk-taking, claims resolution, and other scenarios to understand insurance-related knowledge and more accurately generate content. Without proper data training, even advanced AI algorithms and models like ChatGPT are useless.

### **Digital platform for insurance brokers COVU**

Artificial intelligence tools such as ChatGPT will play a significant role in the digital transformation of the insurance industry in the coming year, implemented by COVU, an artificial intelligence-based digital platform for brokers.<sup>15</sup> The insurance industry will inevitably move towards the use of AI tools to make brokerage agencies simpler, improve customer service and take advantage of cross-selling opportunities.

The COVU platform was established by Ali Safavi and Tasos Chatzimichailidis insurance industry veterans to help independent insurance agents better manage risk, make smarter insurance decisions, and provide better business services and sales support, through AI-driven recommendations. In August 2022, COVU raised \$10 million in initial funds to launch its product. These tools have the potential to reduce customer service costs by up to 30%, which could save insurance agencies millions of dollars. By using AI tools, agents can reduce

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<sup>14</sup> FinTech Global. (2023). *Waterdrop tests ChatGPT-like feature to apply it in insurance services*. <https://fintech.global/2023/02/20/waterdrop-tests-chatgpt-like-feature-to-apply-it-in-insurance-services>

<sup>15</sup> FinTech Global, (2023). AI tools such as ChatGPT to drive digital transformation of insurance, COVU says. <https://fintech.global/2023/01/30/ai-tools-such-as-chatgpt-to-drive-digital-transformation-of-insurance-covu-says>

time spent on administrative tasks, drive targeted marketing efforts, and quickly discover more sales opportunities. Powered by AI and machine learning, the OpenAI ChatGPT platform, used by COVU, automates routine tasks such as document handling and customer segmentation, freeing up critical time for high-value activities such as providing personalized advice to clients, strengthening customer relationships through new offers, and growing businesses.

## **The example of communication with ChatGPT about life insurance**

RGA decided to put ChatGPT to the test by posing three questions related to underwriting and the future of life insurance. The answers from ChatGPT that follow are entirely AI-generated.<sup>16</sup>

*1<sup>st</sup> question: What is the future for digital distribution in life insurance?*

“Digital distribution in life insurance refers to the use of digital channels and technologies, such as websites, mobile apps, and social media, to sell life insurance policies to customers. The future of digital distribution in life insurance is likely to see continued growth and expansion as more and more consumers become comfortable with purchasing insurance online. There are a number of factors driving the growth of digital distribution in the life insurance industry. One key factor is the increasing use of technology and the internet by consumers. More and more people are using the internet to research and purchase products and services, including life insurance, and this trend is likely to continue in the future.

...

Overall, it is likely that the future of digital distribution in life insurance will be characterized by continued growth and innovation, as insurers seek to meet the changing needs and preferences of their customers.”

*2<sup>nd</sup> question: How will COVID-19 affect U.S. long-term mortality?*

“It is difficult to predict the long-term effects of COVID-19 on mortality in the United States. The pandemic has already had a significant impact on mortality, with over 1.1 million COVID-attributed deaths reported in the country. However, it is possible that the mortality rate from COVID-19 could decline over time as more people become immune to the virus and as effective vaccines are developed and distributed. There are also other factors that could affect the long-term mortality rate from COVID-19. For example, the effectiveness of

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<sup>16</sup> Heaton, J., Rengachary, D. (2023). *ChatGPT: A conversation about underwriting and life insurance*. Digital Insurance. USA. <https://www.insurtechinsights.com/chatgpt-a-conversation-about-underwriting-and-life-insurance/>

public health measures, such as mask-wearing and social distancing, in controlling the spread of the virus could have a significant impact on the number of deaths. In addition, the availability of effective treatments for COVID-19 could also play a role in reducing the mortality rate from the virus...”

*3<sup>rd</sup> question: Jerry’s adoptive parents both died in their mid-40s due to hemophilia. How could this affect Jerry’s long-term health prospects?*

“Hemophilia is an inherited disorder that affects the body’s ability to control blood clotting. People with hemophilia often bleed easily and have prolonged bleeding after an injury or surgery. The severity of hemophilia can vary widely, with some people experiencing only mild symptoms and others experiencing severe and life-threatening bleeding episodes. If Jerry’s adoptive parents both had hemophilia, it is likely that Jerry inherited the condition from them. This means that Jerry may also be at risk for bleeding episodes and other complications of hemophilia. It is important for Jerry to be aware of his hemophilia and take steps to manage the condition to reduce the risk of complications. This may include taking medication to help control bleeding, avoiding activities that may cause injury, and seeking medical attention for bleeding episodes as needed....”

Apparently, ChatGPT answered the first two questions with complete success, but failed with the third question, which further cautions the need for checking and verification answers when using GPT technology.

## **5. FUTURE DIRECTIONS OF GPT TECHNOLOGY DEVELOPMENT**

ChatGPT-3 has reached 1 million users in just 5 days from the moment of release into public use, faster than any other platform. It took Facebook and Instagram two years to come up with this magic figure. The popular video game Angry Birds has held the record so far. It took them 35 days to reach a million users.

After the fantastic start of this robot, OpenAI released a version of ChatGPT-4 in March 2023, which brings additional improvements. It was about making this model safer in terms of providing fact-based answers and better aligned with restrictions in the area of prohibited or incorrect content. In addition, it is significantly faster and has a higher capacity in terms of word processing. GPT-4 has a maximum limit of 32,000 tokens (equivalent to 25,000 words), which is



a significant increase from 4,000 GPT-3.5 tokens (equivalent to 3,125 words). The following areas have been particularly advanced in this version 4:

- **Linguistic finesse:** GPT-4 has an even greater ability to understand and generate different dialects and respond to the emotions expressed in the text;
- **Better information synthesis:** GPT-4 can answer complex questions by synthesizing information from multiple sources, while GPT-3 is more difficult to cope with this challenge;
- **Creativity and coherence:** While GPT-3 can generate creative content, GPT-4 goes a step further by producing stories, poems, or essays with improved coherence and creativity;
- **Solving complex problems:** GPT-4 demonstrates a strong ability to solve complex mathematical and scientific problems beyond the capabilities of GPT-3;
- **Programming Assistance:** GPT-4 programming capabilities have conquered social networks with their ability to generate software snippets or more effectively debug existing code than GPT-3;
- **Understanding images and graphics:** Unlike GPT-3, which focuses primarily on text, GPT-4 can analyze and comment on images and graphics. For example, it can describe photo content, identify trends in the chart, or even generate captions for images, making it a powerful tool for education and content creation;
- **Reducing inadequate or biased responses:** GPT-4 implements mechanisms to minimize unwanted results, thereby increasing reliability and ethical accountability. GPT-4 is less likely to generate politically biased, offensive or harmful content.

Version 4 of the ChatGPT family is available for use, but only in ChatGPT Plus paid subscription. The current free version of ChatGPT that can be accessed at the time of writing this text in April 2023 is still based on GPT-3.5.

According to OpenAI, GPT-4 achieves human-level performance scores for many standardized tests, such as a simulated law school entrance test, a school proficiency test and a diploma exam. In the simulated bar exam, GPT-4 placed in the top 80-90% compared to GPT-3, which was among the worst, in the bottom 10%.<sup>17</sup> The previous chapter describes how RGA tested GPT-3 using three insurance questions. While GPT-3 provided good answers to questions about the long-term effects of COVID-19 mortality and the future of digital life insurance distribution, it erroneously assumed that adoptive parents could pass

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<sup>17</sup> Heaton, J. (2023). *GPT-4 Upgrade Improves Results, Expands Application Potential*. Reinsurance Group of America. USA. <https://www.rgare.com/knowledge-center/media/articles/gpt-4-upgrade-improves-results-expands-application-potential>

on genes to their biologically disconnected children. GPT-4 correctly answered all three questions, providing more detail without significantly increasing the length of the answer.

Of course, ChatGPT-4 is not without errors either. OpenAI has admitted that people still have to check its work. For example, when asked which parties must have an insured interest in the policy and whether agents can conduct specific medical tests, GPT-4 answered incorrectly. Also, by embedding GPT-4 in Internet browsers, it is possible that queries will not return a reading list to Google, Bing, and others. Instead, search engines with an integrated AI function can generate text that synthesizes the source material. Such a presentation may prevent the user from reading multiple articles covering topics from different viewpoints, which could lead to a significant deviation from the content of the websites providing the source material. Search results could therefore be inconclusive because they are biased, misleading, or inaccurate.

It is certain that this technology will continue to develop and that insurers will identify new examples of its use in the future. The development of GPT-5, which will bring significant improvements to the currently available ChatGPT technology, is already underway, but OpenAI has not yet set an official release date.

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