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Generative artificial intelligence (AI) in the insurance sector: a revolution in the making

The rise of generative AI

Picture this: You are browsing through an insurance website, pondering the myriad of policies available. Suddenly, a chat window pops up, and you are greeted by a virtual assistant. You type in a complex query about a specific clause in a life insurance policy. Within seconds, you receive a detailed, human-like response, simplifying the insurance jargon and even offering a personalised recommendation based on your profile. This is not science fiction; it is the power of generative AI in action.

As the digital age advances, the insurance industry stands on the brink of a revolution. Generative AI, once limited to basic chatbots, has now evolved into sophisticated tools like ChatGPT and Google Bard, reshaping the way insurers interact with clients, assess and process claims, and even formulate and underwrite policies. This article delves deep into this transformative technology, exploring its potential challenges, and what this could indicate for the future of the insurance sector.

Understanding generative AI: neural networks and foundational models

To understand the complexities of generative AI, it is essential to first explore the ideas of neural networks and foundational models. Think of neural networks as similar to the vast network of roads in a bustling city. Just as roads connect various destinations and

facilitate the flow of traffic, the human brain has an intricate web of connections where billions of neurons communicate, interpreting and reacting to stimuli. This intricate city-like connectivity in our brain is the inspiration behind neural networks in AI. Instead of neurons, these networks have intersections or junctions, known as nodes. Each node, like a busy intersection, manages the flow of information - receiving, processing and passing it on, directing data much like traffic controllers manage the flow of vehicles based on established rules and patterns.

Now, imagine the vastness of the Library of Alexandria¹, a treasure trove of knowledge. In the digital world, Large Language Models (LLMs) are a subset of foundational models² that serve a similar purpose. When presented with a question, an LLM doesn't just consult a single source. It sifts through a multitude of texts, pulling from a vast reservoir of data to construct a coherent and pertinent answer. Models like ChatGPT function as expert librarians, having been trained on enormous datasets, producing responses that mimic human conversation and understanding.

What distinguishes outstanding generative AI? Two pivotal components: a sturdy neural network and an abundance of high-calibre data. The neural network lays the groundwork, forming the intricate system that processes and learns. Yet, even the most advanced network is only as proficient as the data it is trained on. For foundational models, including LLMs, to reach their peak effectiveness, they require access to a diverse range of quality data. This synergy ensures that when you interact with the model, the neural network adeptly steers it, yielding prompt, precise and insightful responses. Together, they represent the peak of generative AI, transforming our relationship with technology.

¹ https://en.wikipedia.org/wiki/Library_of_Alexandria

² [A foundation model is a deep learning algorithm that has been pre-trained with extremely large data sets scraped from the public internet. \(https://www.techopedia.com/definition/34826/foundation-model\)](https://www.techopedia.com/definition/34826/foundation-model)

The surging mainstream appeal of generative AI can be credited to sophisticated foundational models, including LLMs like ChatGPT. In contrast to traditional chatbots that function based on pre-set scripts, foundational models are educated on extensive data, empowering them to produce varied and human-like content. Driving this technological advancement are elements such as enhanced computational capabilities, refined algorithms and the unprecedented volume of accessible data today.

It is crucial to recognize that the expertise of generative AI is not limited to textual realms. Its proficiency spans a wide spectrum of tasks, from translating text descriptions into vibrant visuals to designing lifelike virtual worlds. The capabilities do not end there; generative AI can craft melodious tunes, emulate human voices and even produce operational code for a plethora of programming languages. Such adaptability signifies that its impact is not restricted to one domain. Indeed, considering its diverse applications, generative AI is set to bring about transformative shifts across various sectors. Sectors like healthcare, finance, real estate and even agriculture are poised to witness ground-breaking changes steered by the prowess of generative AI. Consequently, its influence will be deep-rooted and all-encompassing, redefining the functional and strategic contours of many industries in the global market.

Universal use cases: beyond insurance

The application of generative AI spans various sectors, offering transformative solutions that redefine traditional business operations. The following are examples of operational factors which can be revolutionised and automated using generative AI. In our examples, we have disclosed template prompts or instructions to the AI and indicated the type of output which will be generated.

Personalised user experiences: User behaviour and preferences can be analysed to tailor interfaces or product recommendations.

Prompt: "Recommend products for User X who frequently buys eco-friendly items."

Output: A list of sustainable products that align with the user's purchasing history and have received favourable reviews from similar user profiles.

Innovative solutions: Creating new product designs or simulating business scenarios for strategic planning.

Prompt: "Design a sustainable packaging solution for a new line of organic teas."

Output: Detailed design concepts focusing on eco-friendly materials and aesthetics.

Email interpretation and responses: Generative AI can read, interpret and craft appropriate responses to emails, streamlining communication.

Prompt: "Respond to an email inquiring about our company's bulk purchase discounts using a customer-friendly tone."

Output: A polite email detailing the available discounts for bulk purchases and the steps to avail them.

Data analysis: Sifting through vast datasets, offering visual insights and interpretations.

Prompt: "Give me insightful charts for this sales data from January to March."

Output: A set of charts highlighting sales trends, peak sales days and areas needing improvement.

Coding interpretation: For businesses venturing into software development, generative AI can interpret code, identify issues, or even suggest improvements.

Prompt: "Review this Python code and suggest optimisations."

Output: A detailed review of the code with suggestions for enhancing efficiency and fixing potential bugs.

For the successful deployment of these capabilities, enterprises must harness appropriate AI models, robust computational frameworks and industry-relevant data. Transitioning from conventional techniques to AI-centric strategies offers enhanced precision, operational efficiency and the potential for growth in numerous operational categories.

A deep dive: generative AI in insurance

Generative AI emerges as an insurance game-changer, poised to redefine the very fabric of the sector. With its unparalleled ability to analyse vast datasets, craft personalized interactions and automate complex processes, generative AI promises to transform traditional insurance paradigms. The following are examples of how generative AI can actively contribute to the insurance sector:

- **Claims processing:** At the core of claims processing lies the need to assess vast amounts of data, from accident reports to policy details, to determine the validity and value of a claim. Generative AI, trained on historical claims data, can swiftly process and evaluate these claims. Natural Language Processing (NLP) capabilities within generative AI can be employed to automatically parse and interpret written statements or reports, extracting key details and cross-referencing them with policy terms and conditions. This not only accelerates the claims review process but also ensures a higher degree of accuracy, minimizing human error. Furthermore, as the AI system continually learns from each processed claim, it refines its algorithms, leading to progressively improved decision-making over time.

Real-life example: Lemonade, a tech-driven insurance company, has implemented AI in its claims processing. Their AI-powered chatbot can handle claims almost instantaneously. In one notable case, Lemonade's AI processed and approved a claim in just three seconds. By analyzing the claim details against the policy and historical data, the AI was able to quickly determine the claim's validity and initiate payment.

- **Underwriting:** By analysing datasets, AI can identify patterns and risks that humans might overlook, leading to more accurate policy pricing and risk assessment. Generative AI can assist underwriters in ensuring consistent and fair policy decisions. For instance, when faced with a claim, the AI can meticulously search through medical research and historical data to assess the validity of the claim. It can compare the claimant's data to others in similar circumstances to ensure consistent outcomes. If a claim is denied, the AI can reference specific details like past medical history, regular health check-ups and other relevant factors to ensure that similar situations are treated identically. This consistency not only enhances the trust of policyholders but also ensures that the insurer remains compliant with regulatory standards and avoids potential legal challenges. By leveraging generative AI, underwriters can ensure that their decisions are both data-driven and consistent, minimizing biases and errors.

Real-life example: Zurich Insurance has been exploring the use of AI in underwriting. They have developed a tool that uses machine learning to assess the risk associated with individual commercial vehicles. By analyzing a vast array of data points, including vehicle type, usage and historical accident data, the AI can provide a more nuanced risk assessment. This allows Zurich to offer more personalized pricing and coverage options, reflecting the specific risk associated with each vehicle.

- **Fraud prevention:** By analyzing vast datasets of historical claims, generative AI can identify subtle, complex patterns that might elude human investigators or rudimentary algorithms. For instance, it can discern recurring anomalies in claim submissions from specific regions, detect improbable sequences of events, or flag claims that match known fraudulent patterns. This includes the ability to analyze metadata from images submitted as evidence to detect inconsistencies that suggest tampering. Moreover, as fraudsters evolve their tactics, generative AI can continuously learn from new data, adapting in real-time. This dynamic learning capability ensures that detection mechanisms remain a step ahead of malicious actors. By integrating generative AI into the claims processing workflow, insurance companies can enhance their fraud detection rate, reduce false positives and streamline the overall claims verification process.

Real-life example: AXA Switzerland, a leading global insurance company, has been leveraging AI and machine learning to enhance its fraud detection capabilities. They have developed advanced algorithms that analyze vast amounts of claims data to identify potential fraudulent patterns. For instance, the system can flag claims that have unusual billing patterns or that come from providers with a history of suspicious activity. By integrating AI into their fraud detection processes, AXA has been able to significantly reduce fraudulent claims, saving millions of dollars annually. This not only benefits the company's bottom line but also ensures that genuine policyholders are not penalized with higher premiums due to fraudulent activities.

- **Text-to-image generative AI to assist with understanding policy claims:** One of the perennial challenges insurance companies face is ensuring that customers fully grasp the scope and limitations of their policies. Traditional textual policy documents, while comprehensive, can often be dense and challenging to decipher for the average policyholder. Here, text-to-image and other media-generating AI capabilities can revolutionize policy communication. Imagine a customer inquiring about the specifics of their car insurance coverage. Instead of directing them to lengthy policy documents, the AI could generate a visual representation, perhaps an interactive 3D model of a car, highlighting areas covered and those excluded. Damage scenarios could be visually simulated, allowing the customer to see, for instance, what "water damage" or "collision damage" looks like. Similarly, for more abstract concepts, the AI could produce animations or infographics, turning vague terms into tangible visuals. This not only enhances customer understanding but also reduces the likelihood of disputes arising from misinterpretations. In the South African environment, this could assist with tapping into the uninsured market characterised by low levels of literacy. Turning a traditionally complex product into one that can be easily understood by the layman, can increase penetration levels into the local market.

For the future: While there is not a widely recognized real-life example of insurance companies using text-to-image generative AI to elucidate policy claims as of now, the potential is palpable. The rapid advancements in AI technology, especially in the realm of image generation and recognition, make this a feasible next step. Companies like NVIDIA and DeepMind have already showcased AI's ability to generate highly detailed and realistic images from textual descriptions. As technology continues to evolve, it is not far-fetched to envision a future where insurance companies harness this capability to transform complex policy terms into easily digestible visual representations. Such innovations would not only enhance customer understanding but also foster trust, as policyholders can visually grasp the extent and limitations of their coverage.

- **Customer support:** Generative AI, with its profound ability to swiftly process vast data sets, grasp contexts and craft human-like interactions, offers a transformative solution. For instance, when a policyholder seeks updates on the status of a claim, the AI, seamlessly integrated with the company's claims management system, can promptly retrieve and relay the latest information. For intricate queries, the AI can clarify policy nuances, guide customers through troubleshooting, or even simulate relatable scenarios for clarity. What is more, generative AI can cater to a global audience by communicating in multiple languages and adjusting its explanations to suit varied comprehension levels. With so many official languages in the country, South African insurers may benefit significantly if they were able to communicate to policyholders in a language they best understand, reducing misunderstandings and increasing sales levels. By weaving in analogies, it can help ensure that complex insurance concepts become accessible and relatable to everyone. As it continually learns and refines its interactions based on feedback, the AI promises not just accuracy, but also a personalised touch.

Real-life example: Geico's virtual assistant, "Kate", is an AI-driven chatbot that helps answer customer queries about policies, billing and other insurance-related questions. Kate can provide instant, detailed responses, guiding customers through the complexities of their insurance policies.

- **Marketing:** By analysing datasets such as customer preferences, purchasing behaviours and market trends, generative AI can identify and predict what resonates with potential policyholders. This allows for the creation of highly targeted and personalized marketing campaigns. When promoting life insurance, generative AI can craft emotionally resonant messages tailored to specific demographics. By understanding the varying levels of life stages, aspirations and fears of potential customers, the AI can generate compelling content that strikes a chord.

Real-life example: Allstate, another major insurer, uses AI to analyze customer data and craft personalized marketing campaigns. By understanding individual customer needs and preferences, Allstate can send targeted offers and promotions, increasing the likelihood of policy renewals and upsells.

- **Customer acquisition, retention and upselling:** In the fiercely competitive insurance landscape, customer acquisition, retention and upselling are pivotal to sustained growth. For customer acquisition, generative AI can analyse market-related datasets to identify potential market segments that are underserved or exhibit patterns indicating a need for insurance. By crafting personalized outreach campaigns based on this analysis, insurers can target prospects with precision, offering tailored policies that resonate with their specific needs. Once customers are onboarded, generative AI can monitor their interactions, feedback, changing life circumstances and changes in competitor offerings to predict when customers might be considering switching providers. By pre-emptively addressing concerns or offering bespoke policy adjustments, insurers can enhance retention. Furthermore, upselling becomes more strategic with generative AI. Instead of blanket promotions, AI can identify which customers are more likely to benefit from additional coverage or a policy amendment, based on their life events, feedback or interaction history. For instance, a customer who recently had a child might be receptive to an upsell on life insurance or education policies. By making upselling deeply personalized and timely, generative AI ensures that it is perceived by the customer as value addition rather than just another sales pitch.

Real-life example: State Farm utilizes AI to analyze customer behavior and predict when they might be considering switching to a different insurer. By identifying these potential "churn" moments, State Farm can proactively reach out to customers with special offers or policy adjustments to retain their business.

- **Identification of common factors from claimants which were previously unidentified:** Understanding the nuanced factors that influence claim patterns can be a game-changer. Generative AI can delve deep into vast datasets of claimants or customers to unearth previously unidentified commonalities. By analysing historical data, customer interactions and claim details, generative AI can identify subtle patterns or correlations that might escape traditional analytical methods. For instance, it might detect that claimants from a specific geographic region tend to report a particular type of incident during certain months, or that customers within a certain age bracket have specific preferences or concerns that were not previously addressed. These insights, powered by generative AI's pattern recognition, can be invaluable for insurers. This can lead to more accurate risk assessments, tailored policy offerings and proactive customer engagement strategies. Moreover, by continuously learning from new data, generative AI ensures that these insights remain dynamic and evolve with changing customer behaviours and trends, allowing insurance companies to stay ahead of the curve and offer more personalized services.

Real-life example: MetLife has been leveraging AI to analyze vast datasets of claimants to identify patterns or commonalities. For instance, they might find that a specific age group in a particular region is more likely to file certain types of claims. This insight allows MetLife to adjust their policies and marketing strategies accordingly.

The double-edged sword: risks and challenges

The insurance industry is undergoing a transformative phase with the integration of generative AI. This powerful technology promises to revolutionise customer interactions, streamline processes and offer unprecedented insights. However, as with any significant technological shift, the adoption of generative AI brings challenges and considerations. The following section delves into some of the most pressing concerns and considerations for the insurance industry in its journey towards AI-driven operations.

Absence of human connection and overreliance on technology

While generative AI tools offer efficiency and 24/7 availability for customer engagement, their use is not without risks. Relying solely on chatbots for selling insurance can be a precarious endeavour. These automated systems, if not meticulously designed and regularly updated, might miss out on critical questions or misinterpret user input, leading to incorrect policy recommendations. Such oversights can have far-reaching consequences. A policyholder might find themselves inadequately covered during a crisis, leading to financial losses. This, in turn, can result in legal complications and reputation damage for the insurer, with claims of misrepresentation or failure to adequately inform the policyholder. Moreover, the dangers of overreliance on AI for insurance sales become evident when dealing with complex cases or nuanced customer needs. While AI can handle straightforward scenarios, there are instances where human judgment, empathy and experience are irreplaceable. Personalised advice, understanding unique situations and building trust are areas where human agents excel. As the insurance industry continues its digital transformation journey, it is crucial to strike a balance, ensuring that the convenience of AI is complemented by the expertise and personal touch of human interaction.

Potential for information breaches

Recent incidents in the corporate world underscore the risks of using general-purpose generative AI with sensitive information. A notable example is Samsung's decision to ban the use of ChatGPT and other generative AI tools by its staff following a leak of sensitive company information. For insurance entities, such risks are magnified due to the nature of their operations. Insurers handle vast amounts of personal data, from health records to financial details and any inadvertent sharing or generation of this data through AI could lead to severe breaches of confidentiality. Moreover, pricing determinations, a cornerstone of the insurance business model, are based on proprietary algorithms and data sets. If generative AI tools were to inadvertently disclose or misinterpret this information, it could not only lead to competitive disadvantages but also regulatory repercussions. This serves as a stark reminder that while generative AI offers transformative potential, its integration into business processes, especially those handling sensitive data, must be approached with utmost caution.

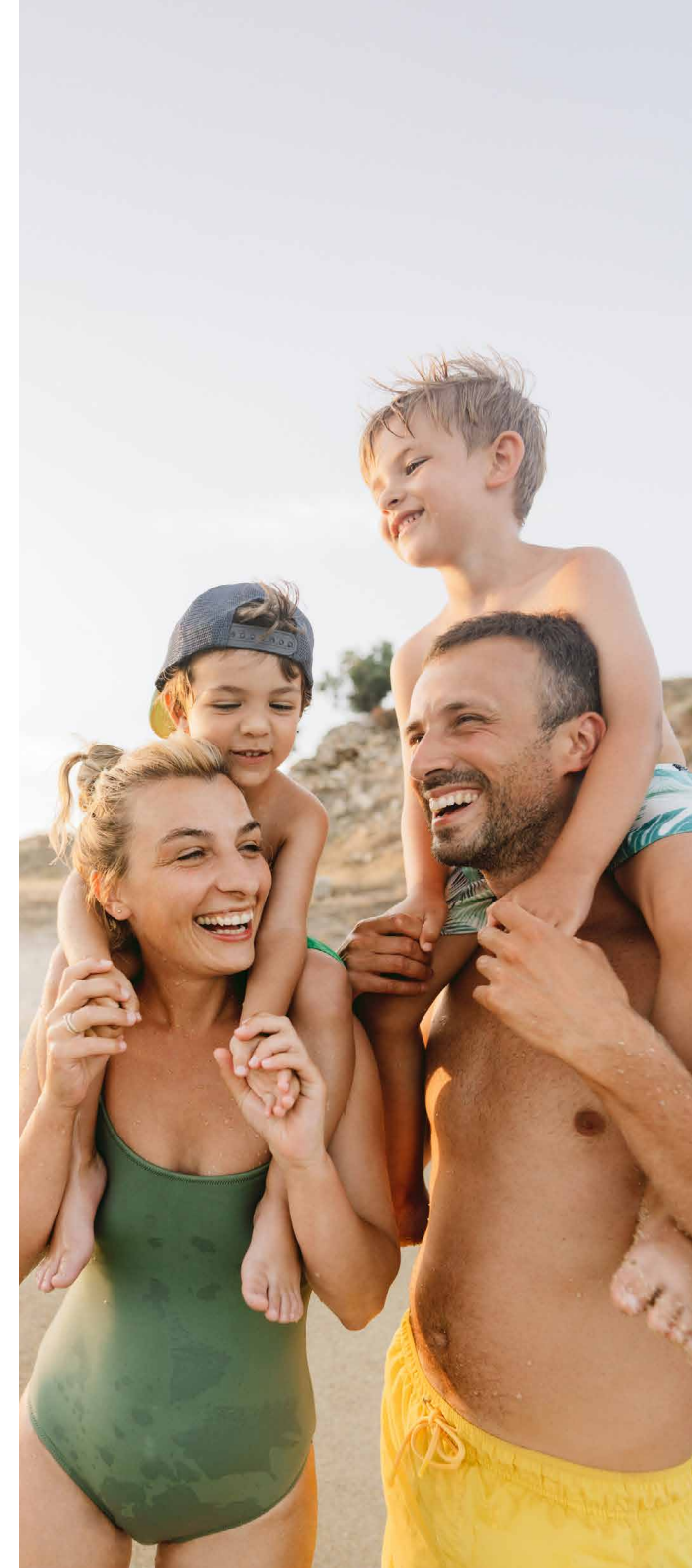
Black box dilemma

While AI can enhance precision and efficiency, it also introduces the "black box" dilemma, where the decision-making process of the AI becomes opaque and difficult to interpret. This lack of transparency can inadvertently lead to the perpetuation of biases. If the data used to train the AI contains inherent biases, the AI might make decisions that are unfairly discriminatory. For instance, if historical data shows a bias against a particular demographic, the AI might continue that bias in its decisions, leading to unfair pricing or coverage determinations for that group. This is particularly concerning for insurance companies, as they could unknowingly adopt and perpetuate these biases, leading to unjust treatment of certain policyholders. The inverse may also be true in that bias is more likely to be perpetuated by a human being than a machine.

Given the stringent transparency regulations imposed on insurers, this obscurity poses a significant risk. Insurers are mandated to be transparent in their policy determinations, ensuring that customers and regulators alike understand the rationale behind pricing, coverage limits and exclusions. Relying on AI models that cannot be easily explained or justified could lead to non-compliance with these transparency requirements. This not only jeopardizes the trust of policyholders but also exposes insurance entities to regulatory scrutiny and potential legal ramifications. As such, while AI offers transformative potential for the insurance industry, its adoption must be approached with a keen awareness of regulatory obligations and the paramount importance of transparency.

Regulatory considerations

The integration of generative AI into the insurance sector is charting new territories and with it comes an evolving regulatory landscape. As regulators grapple with the implications and potential risks of this technology, they are formulating guidelines and standards to ensure consumer protection and industry integrity. Insurers, eager to harness the efficiencies and innovations offered by generative AI, must tread this path with caution. While the allure of AI-driven solutions is undeniable, there is a real risk of investing heavily in technologies that might soon face stringent regulatory restrictions or even prohibitions. Such scenarios could lead to significant sunk costs, where investments in AI infrastructure and training become non-recoverable. Furthermore, non-compliance with emerging regulations could result in hefty penalties, legal challenges and reputational damage. It is imperative for insurers to stay abreast of regulatory developments, engage in industry dialogue and adopt a flexible approach. This ensures that while insurers leverage the benefits of AI, they are also prepared to adapt to any regulatory shifts, safeguarding their investments and maintaining compliance.





The outlook for the insurance industry

The insurance sector, traditionally cautious in embracing technological advancements, now finds itself at a pivotal juncture. Generative AI presents an opportunity to address age-old challenges and elevate operational efficiency. In a fiercely competitive landscape, hesitating to harness this technology could be a strategic misstep. At its core, insurance is about problem-solving and generative AI emerges as a formidable ally in this mission. Pioneers in this space are poised to carve out a competitive advantage, while those who delay may grapple with playing catch-up.

Crafting in-house LLMs tailored for the insurance domain is no small feat. It demands vast data reservoirs, significant computational prowess and deep expertise. The multifaceted nature of insurance, spanning life, motor, business and more, introduces additional intricacies. Each segment carries its distinct nuances, jargon, and customer anticipations. Designing dedicated LLMs for every category is an ambitious undertaking.

In the interim, insurers might find merit in harnessing generic foundational models. While these are not tailored for distinct insurance categories, their utility is substantial. They can streamline administrative functions, address customer inquiries, bolster marketing initiatives and even contribute to initial risk evaluations. As the technology landscape evolves, a gradual pivot towards more niche models is conceivable. However, even the current generic LLMs can catalyse efficiency, curtail expenses and uplift the customer journey.

It is crucial for insurers to refrain from using the fluid regulatory backdrop as a crutch for innovation inertia. The AI regulatory sphere is in flux, but this should not deter insurers from technological evolution. A proactive AI integration strategy, underpinned by ethical and transparent practices, can propel insurers to the vanguard of industry transformation. This not only fortifies their future trajectory but also underscores a progressive mindset that balances customer-centricity with regulatory adherence.

For the visionaries in the insurance realm, the future is filled with potential. Envision a world where policy transparency is the norm, claim processing is expedited and every customer feels genuinely acknowledged and cherished. In this forthcoming era, those who adeptly weave generative AI into their strategic tapestry will redefine industry standards.

Disclaimer: While portions of this article have been enhanced by an AI model, not all text is AI-generated. The core ideas and essence stem from a human author. The organization, grammar and presentation have been refined with the assistance of AI.

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