Unlock the Potential

Generative AI's Impact on the Insurance Industry

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1. Introduction

Generative AI (GenAI), a subset of artificial intelligence (AI), represents a transformative technology capable of creating new, original content—including text, images, audio, and video—based on its training data.

This technology leverages advanced machine-learning models, particularly deep learning neural networks, to generate outputs that can mimic human creativity and reasoning.

Recent studies underscore the significant strides made in the adoption and implementation of GenAI across various sectors. With an increasing number of employees and executives leveraging GenAI to streamline workflows and generate at least five hours of work savings per week,[1] the potential of the technology to redefine productivity and work quality is evident.

GenAI promises to revolutionize the insurance industry, much like the impacts of VisiCalc, Lotus 1-2-3, and Excel when they were first introduced. These software innovations transformed the way data was managed and analyzed, leading to significant improvements in productivity and decision-making processes.
Similarly, GenAI's ability to automate tasks, extract insights from data, and enhance customer experiences has the potential to redefine how insurance operations are conducted, greatly enhancing efficiency, reducing costs, and driving innovation. However, realizing these benefits requires careful consideration of the associated risks and challenges.

This paper aims to provide an overview of GenAI's role in the future of insurance, equipping industry stakeholders with the knowledge to make informed decisions about leveraging this technology, focusing on both the opportunities it presents and the challenges it poses.

2. Understanding Generative AI

GenAI represents a significant evolution in the field of AI, distinguishing itself from traditional forms of AI through its ability to create original content that can mimic human outputs. Unlike analytical AI, which primarily focuses on interpreting and analyzing data to make predictions or decisions, GenAI can generate text, images, audio, and video that were not explicitly programmed into it. This is achieved through advanced machine learning models, particularly deep learning and neural networks, which are trained on large datasets to produce outputs based on the patterns, styles, or information they have learned.

[1] BCG study (2024), based on 13,000+ respondents in 15 countries

2.1 How GenAI differs from other forms of AI

GenAI stands out from traditional AI by its remarkable ability to create original content, shifting the focus from analyzing existing data to generating new text, images, audio, and video, marking a significant leap beyond the capabilities of traditional AI forms. This section outlines three key differentiators:

- **Content creation**: GenAI can produce new content, whereas traditional AI focuses on analyzing existing data. For example, while analytical AI might predict customer behavior based on past data, GenAI can create entirely new customer interaction scripts or marketing content.
- **Learning and adaptation**: GenAI models, especially those based on transformer technology like GPT (generative pretrained transformer), learn from vast amounts of data and can adapt their outputs to mimic the style or meet the requirements specified in their prompts[2]. This is a step beyond the capabilities of traditional AI, which requires more specific instructions and cannot as easily produce varied outputs.
- **Applications**: Traditional AI has been used for tasks like data analysis, pattern recognition, and automation of repetitive tasks. GenAI, on the other hand, opens up new possibilities for creative and complex tasks that require a level of originality and adaptability, such as content creation, design, and interactive customer service.

2.2 Examples of GenAI in industries

GenAI has diverse applications in various industries, transforming the way businesses approach creativity, innovation, and problem-solving:

- **Marketing and advertising**: GenAI can create personalized content for marketing campaigns, generate creative ad copy, and design visuals that cater to specific audience segments, enhancing engagement and conversion rates.
- **Software development**: Tools like GitHub Copilot use GenAI to assist developers by suggesting code snippets, completing lines of code, and even generating entire functions based on the context provided by the developer, significantly speeding up the development process.
- **Entertainment and media**: GenAI can produce music, write stories, or create digital art, offering new tools for artists and creators to explore innovative expressions and ideas.

[2] A prompt is natural language text describing the task that an AI should perform (definition: Wikipedia).

- **Research & Development**: In industries like pharmaceuticals, GenAI accelerates the discovery of new drugs by predicting molecular structures that could lead to effective treatments, reducing the time and cost associated with traditional research methods.
- **Logistics**: GenAI helps optimizing global trade routes, designing efficient logistics networks, and optimizing last-mile delivery routes, leading to cost savings, improved efficiency, and customer satisfaction.

2.3 Potential applications in the insurance industry

GenAI has promising opportunities for the insurance sector. From personalized customer interactions to claims processing, risk assessment, fraud detection, and product development, Gen AI has the potential to enhance operational efficiency, customer experience, and risk management within the insurance industry.

- **Personalized customer interactions**: GenAI can power chatbots and virtual assistants to provide highly personalized advice and support to customers, improving customer service and engagement.
- **Claims processing**: GenAI can automate the generation of reports and documentation for claims processing, making the process faster and more efficient while reducing the potential for human error.
- **Risk assessment**: By analyzing vast datasets, GenAI can identify patterns and predict risks more accurately, enabling insurers to tailor policies more closely to the individual risk profiles of their clients.
- **Fraud detection**: GenAI can simulate various fraudulent scenarios to train systems to better detect and prevent insurance fraud, protecting both the insurer and the insured.
- **Product development**: GenAI can help insurance companies develop new products by analyzing customer data and market trends to identify unmet needs and opportunities for innovation.
- **Merger & Acquisition (M&A) activities**: GenAI is expected to also have a significant impact on M&A activities. It can help expedite due diligence by automating the process of comprehending and summarizing documents, identifying key points, and drawing patterns that might be overlooked by humans. Trained GenAI models could flag potential risks associated with an M&A deal, analyze historical data to identify red flags, and highlight financial irregularities or compliance issues. This automation can save time and resources, making the due diligence process more efficient. Furthermore, GenAI could also assist in performing a data room scan, contracts and value chain analysis, and analyzing proposals. It

could help determine the fair market value of the target company by considering various factors such as its assets, liabilities, future cash flows, growth potential, and current market landscape. Additionally, GenAI can be used to prepare executive briefing plans and board papers to ensure that senior stakeholders understand the rationale behind the deal and its implications, including closing risks.

3. Impact on Insurance Operations

This section delves into the specific impacts of GenAI on insurance operations, shedding light on how this advanced technology stands to streamline underwriting processes, enhance claims management, improve risk assessment, elevate customer service, and bolster operational efficiency. By harnessing the capabilities of GenAI, insurers can expect to witness a paradigm shift in their approach to conducting business, with profound implications for the industry as a whole.

3.1 Streamlining underwriting processes

- **Automated data analysis and risk evaluation**: GenAI can analyze vast amounts of data from various sources, including social media, Internet of Things devices, and historical data, to assess risks more accurately and efficiently. This capability allows for more precise and personalized underwriting, reducing the reliance on broad actuarial tables.
- Policy personalization: By understanding individual risk profiles better, insurers can offer personalized policies that are more aligned with the specific needs and risk levels of their customers, potentially leading to better pricing and coverage options.
- Speed and efficiency: GenAI can automate the underwriting process, significantly reducing the time required to assess and approve policies. This speed in processing not only improves operational efficiency but also enhances customer satisfaction by providing quicker service.

3.2 Enhancing claims management

- Automated claims processing: GenAI can automate the claims handling process, from initial notification to final settlement. It can validate claims against policy terms, assess damages using images or videos, and even predict fraudulent activities, thereby speeding up the claims process and reducing manual errors.
- Customer service: AI-powered chatbots and virtual assistants can provide 24/7 support to customers, guiding them through the claims process, answering their questions, and updating them on claim status, which enhances the overall customer experience.

3.3 Improving risk assessment

- Predictive analytics: GenAI can identify patterns and trends in data that humans might overlook. By analyzing historical data and real-time inputs from various sources, it can predict future claims and identify potential risk factors more accurately.
- Dynamic risk modeling: Unlike traditional models that might be updated periodically, generative AI models can continuously learn and adapt to new data, leading to more dynamic and accurate risk models. This capability allows insurers to adjust their policies and pricing in real time, reflecting the most current risk assessments.

3.4 Enhancing customer service

- Personalized interactions: GenAI can analyze customer data to provide personalized advice, recommendations, and services. This level of personalization can improve customer engagement and satisfaction.
- Self-service capabilities: AI-driven platforms can empower customers to manage their policies, submit claims, and get instant responses to their inquiries without human intervention, offering convenience and efficiency.

3.5 Improving operational efficiency

- Process automation: Beyond underwriting and claims management, generative AI can automate routine tasks across the organization, such as customer onboarding, document verification, and compliance checks, freeing up human resources for more complex tasks. It's important to note that these initiatives may not solely rely on GenAI technology and should be complemented by traditional IT processes like robotic process automation (RPA) to maximize their effectiveness. This is also true for prediction process initiatives (see Section 3.3) which could be paired with more traditional machine learning techniques.
- Insights and decision-making: By analyzing data across the organization, GenAI can provide actionable insights that help in strategic decision-making, identifying new market opportunities, and optimizing resource allocation.

4. Implementing GenAI in Insurance

Implementing GenAI in an insurance company offers the potential to significantly enhance operational efficiency, customer satisfaction, and competitive advantage. However, success depends on careful strategic planning, attention to data quality and security, investment in technology infrastructure, and the cultivation of skilled personnel. By addressing these areas, insurance companies can navigate the challenges of GenAI implementation and realize its full potential.

4.1 Developing a GenAI strategy

The first step in implementing GenAI in insurance is to define clear, measurable objectives. Goals may include enhancing customer experience, streamlining claims processing, improving risk assessment accuracy, or automating administrative tasks. Establishing these goals early on guides the direction of the GenAI initiative and sets benchmarks for success.

Once goals are set, identify key areas where GenAI can have the most significant impact. As mentioned in the previous section, potential applications include:

- **Customer engagement**: Using GenAI to create personalized insurance products and communication
- **Claims processing**: Automating the evaluation and processing of claims to increase efficiency and accuracy
- **Risk assessment**: Enhancing predictive models to assess risk more accurately and tailor premiums accordingly
- **Fraud detection**: Leveraging GenAI to identify patterns indicative of fraudulent activity

The EY-Parthenon Insurance GenAI Survey highlights that, based on 200 senior insurance decision-makers, 99 percent of insurers are already investing in GenAI (42 percent) or making plans to invest (57 percent), with a significant focus on enhancing productivity, reducing costs, and generating new revenue. Additionally, the survey reveals that more than 70 percent of respondents are allocating at least $5 million to GenAI.

4.2 Data quality, privacy, and security

The effectiveness of GenAI models heavily relies on the quality of the data used for training. Insurance companies must ensure that the data is accurate, comprehensive, and reflective of real-world scenarios. This may involve cleaning existing datasets, integrating multiple data sources, and continuously updating data to reflect current trends.

Besides, given the sensitive nature of personal and financial information handled by insurance companies, maintaining privacy and security is paramount. Implementing robust data encryption, access controls, and anonymization techniques is essential.

4.3 Technological requirements and infrastructure

Deploying GenAI requires a scalable and secure IT infrastructure. This includes sufficient computing power for training complex models, data storage solutions, and robust network security. Cloud-based platforms often offer the scalability and flexibility needed for such initiatives.

GenAI solutions must integrate seamlessly with existing IT systems, including customer relationship management (CRM) systems, claims processing platforms, and risk assessment tools. This integration ensures that GenAI applications can access necessary data and function within the broader IT ecosystem.

It is worth mentioning that the development of internal GenAI solutions is essential for insurers to ensure sovereignty over the AI technologies deployed within their operations. By creating and implementing proprietary GenAI solutions, insurance companies can maintain control over the development, training, and utilization of AI models tailored to their specific needs, while avoiding external model training with internal data. This approach empowers insurance companies to safeguard sensitive customer data and mitigate potential risks associated with third-party AI solutions. Additionally, internal GenAI solutions enable insurers to cultivate in-house expertise, fostering a deep understanding of the AI models employed and enhancing the ability to interpret and validate the outputs generated.

4.4 Developing talents and skills

Developing and deploying GenAI solutions requires a team with expertise in AI, data science, software engineering, and insurance domain knowledge. This team is responsible for designing the GenAI models, training them with relevant data, and integrating them into existing workflows.

Once GenAI solutions are deployed, ongoing oversight is necessary to monitor performance, identify areas for improvement, and ensure that the models adapt to changing conditions. This requires skilled personnel capable of interpreting GenAI outputs, assessing model accuracy, and making necessary adjustments.

Besides, to ensure the successful implementation of GenAI, it is essential for all employees to embark on the journey of understanding the benefits and risks associated with its use. Providing comprehensive training will enable employees to understand the potential of GenAI. Additionally, employees need to be educated on the risks associated with GenAI, such as data privacy and security concerns. To achieve this, insurance companies should develop training programs that cover the fundamentals of AI, prompt engineering[3], and the specific applications of GenAI in the insurance domain. These programs can be delivered through workshops, online courses, and on-the-job training to ensure that all employees are equipped with the necessary knowledge and skills to leverage GenAI effectively while mitigating associated risks.

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[3] Prompt engineering is the process of structuring an instruction that can be interpreted and understood by a generative AI model (definition: Wikipedia).

5. Challenges and Limitations

The potential of GenAI to transform the insurance industry is undeniable. However, successful implementation requires careful consideration of ethical implications, data privacy, and the need for human oversight in certain scenarios. Insurance companies must proactively address potential biases in AI models and align their practices with the evolving regulatory landscape. This involves implementing strategies for fairness, transparency, and human oversight, as well as staying informed about and compliant with data protection laws and ethical use guidelines. By doing so, insurers can leverage the benefits of generative AI while ensuring that their practices are fair, ethical, and respectful of consumer rights.

5.1 Addressing biases in GenAI models

GenAI models, by their nature, learn from vast datasets to generate new content, predictions, or decisions. However, these datasets can contain inherent biases that reflect historical inequalities or prejudices. In the insurance sector, this can manifest in unfair pricing, coverage decisions, or discriminatory practices against certain demographics.

To ensure fairness, different strategies can be applied:

- **Diverse and representative training data**: Ensure that the datasets used to train generative AI models are diverse and representative of all demographics. This involves actively seeking out and including data from historically underrepresented groups.
- **Bias detection and mitigation techniques**: Employ advanced algorithms designed to detect and mitigate bias in AI models. This includes regular audits of AI decisions against fairness criteria and adjusting models as necessary.
- **Transparency and explainability**: Implement measures to increase the transparency and explainability of AI models. This means being able to trace how and why a particular insurance decision was made, which is crucial for identifying and correcting biases.
- **Human oversight**: Maintain a system of human oversight where sensitive insurance decisions are reviewed by human experts. This adds an additional layer of scrutiny and ensures that AI-generated decisions align with ethical standards.

5.2 Regulatory landscape for using GenAI in insurance

Despite the potential of GenAI, regulatory uncertainty represents a significant barrier to establishing a dedicated GenAI team, as 67 percent of insurance decision-makers express concerns in this regard[4]. The regulatory environment for using GenAI in insurance is evolving, with a focus on protecting consumer rights, ensuring data privacy, and promoting ethical use of AI.

For example, the General Data Protection Regulation (GDPR) in the EU set strict guidelines on personal data usage, requiring insurance companies to obtain explicit consent for data collection and use, ensuring data minimization, and granting consumers the right to access, correct, or delete their data.

Insurance-specific regulations may also dictate how data can be used in underwriting and claims processing, emphasizing the need for data accuracy, fairness, and non-discrimination (e.g., the Colorado regulation restricting external consumer data usage, the EU regulation prohibiting gender-based pricing, etc.).

Besides, the EU AI Act, published in June 2024, represents a significant regulatory development aimed at ensuring the safety of AI systems. It introduces a risk-based framework that applies across various sectors, including insurance, differentiating AI applications based on their potential risk levels from low to unacceptable. For the insurance industry, particularly concerning high-risk AI applications such as those used for risk assessment and pricing decisions in life and health insurance, the Act mandates specific regulatory requirements. These include a risk management system, data governance, technical documentation, transparency, human oversight, and robustness, among others.

5.3 Environmental, social and governance (ESG) considerations

Although GenAI presents significant potential benefits, it is crucial to approach its use responsibly due to its substantial energy requirements and potential environmental impact. For instance, a research paper[5] highlighted that image generation models can consume as much energy as around half a charge of a smartphone per image generation. This underscores the importance for the insurance industry and other sectors leveraging GenAI to carefully consider and mitigate the environmental implications of widespread GenAI deployment. While the technology holds promise, a responsible approach is essential to ensure that its adoption aligns with broader environmental sustainability objectives and minimizes its carbon footprint.

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4 EY-Parthenon Insurance GenAI Survey (2024)

5 Alexandra Sasha Luccioni, Yacine Jernite, and Emma Strubell. 2024. Power Hungry Processing: Watts Driving the Cost of AI Deployment?

To that extent, small language models (SLMs) represent a promising advancement in the domain of GenAI, offering a more sustainable and responsible approach to leveraging AI technologies within the insurance industry. Compared to their larger counterparts, large language models (LLMs, on which ChatGPT for example is based), SLMs are trained on smaller amounts of data and use fewer parameters, making them not only more cost-effective but also more environmentally friendly due to their lower computational and energy requirements. Besides, SLMs can be tailored to specific enterprise needs, reducing the risk of generating inaccurate or irrelevant content, a common challenge with LLMs.

6. AXA's Involvement in GenAI Topics

AXA has taken significant steps in the field of GenAI. Here are some (non-exhaustive) examples:

- **Partnership with Microsoft**: In the summer of 2023, AXA partnered with Microsoft to develop an internal generative AI solution. This collaboration led to the creation of AXA Secure GPT, a tool based on ChatGPT but hosted internally on Microsoft's Azure Open AI technology to ensure data security. This initiative aimed to familiarize AXA's nearly 150,000 employees with GenAI technology in a secure environment: AXA employees engage with AI, conducting tests and learning to formulate prompts as part of their skill development.

- **Partnership with Mistral AI**: Moving beyond its initial steps, AXA has embarked on a second phase of deploying generative AI by partnering with Mistral AI, a French AI startup launched in April 2023. This partnership aims at continuing to implement artificial intelligence across the insurance value chain and to empower AXA teams to extensively utilize standard AI features in a safe and responsible environment. The company aims to:

    - Develop specific use cases tailored to its activities
    - Focus on reducing bias
    - Enhance result interpretability
    - Limit the carbon footprint generated by these new solutions

7. Conclusions and Recommendations

It's evident that GenAI holds transformative potential for insurers. The insights gathered underscore GenAI's capacity to enhance operational efficiencies, improve customer engagement, and innovate product offerings. However, the journey toward full integration comes with its set of challenges, including ethical considerations, data privacy concerns, and the need for regulatory clarity.

Considering this, these are actionable recommendations for insurance executives:

- **Strategic implementation**: Begin with pilot projects focusing on specific operational areas where GenAI can have an immediate impact. Use these pilots to understand the technology's capabilities and limitations within your operational context.
- **Ethical and privacy framework**: Develop a robust framework that addresses ethical considerations and ensures data privacy. This framework should guide all GenAI initiatives, ensuring compliance with existing regulations and preparing for future legislative developments.
- **Skill development and organizational culture**: Invest in training programs to build GenAI expertise within your teams. Foster a culture of innovation that encourages experimentation and adapts to technological advancements.
- **Collaboration for shaping internal guidelines**: Engage proactively with regulatory bodies to understand the development of GenAI guidelines and shape internal policies. Participation in industry forums can also provide insights into best practices and emerging trends.
- **Customer-centric approach**: Keep the customer at the center of GenAI initiatives. Ensure that the technology is used to enhance customer value, improve service delivery, and meet evolving customer expectations.

The future of GenAI in insurance is promising, with advancements in technology expected to unlock even greater value. As GenAI becomes more sophisticated, its ability to process and analyze complex data will lead to more personalized and dynamic insurance products. The industry is likely to see a shift toward more proactive risk management and prevention services, transforming the traditional insurance model.

However, the pace of technological change will require insurers to remain agile, continuously adapting their strategies to leverage GenAI effectively. Collaboration with tech companies, startups, and academic institutions will be key to staying at the forefront of innovation. Moreover, as the regulatory environment evolves, insurers must remain engaged in shaping policies that support responsible and beneficial use of GenAI.

While the path forward may be complex, the potential rewards of integrating GenAI into insurance operations are significant. By taking a strategic, ethical, and customer-focused approach, insurers can navigate the challenges and position themselves for success in a rapidly changing landscape.

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