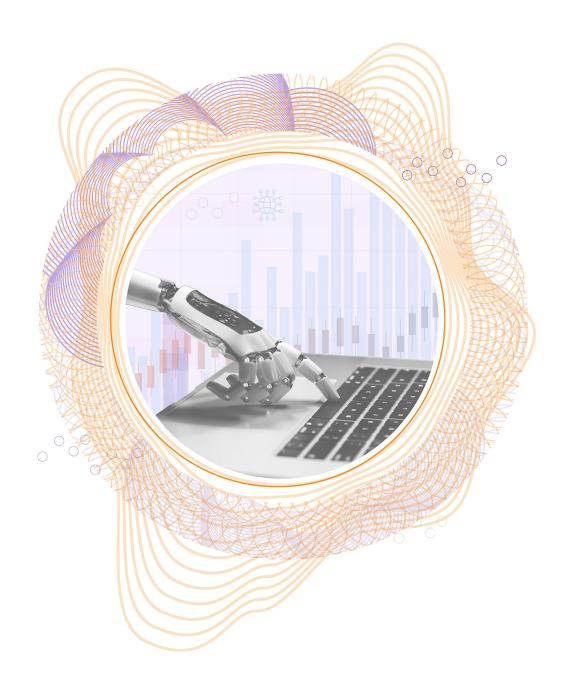# Deloitte.

Underwriter's edge
Harnessing GenAI for optimal outcomes

From automation to contextual intelligence in underwriting

Big data is not a new concept. In 1693, Edmond Halley utilized data to create his famous "life tables," performing the first actuarial work, which laid the foundation for the insurance industry. Since then, insurers have continually leveraged large data sets and statistical models to classify risks, set premiums, and enhance efficiency. However, the modern era has introduced new complications. While the volume and variety of available data have grown exponentially, underwriters must continually adapt to a multitude of technical, business, and regulatory challenges.

With artificial intelligence (AI) and digital transformation, many long-standing pain points in underwriting have become more manageable, paving the way for more nuanced underwriting and portfolio management. Enter Generative AI (GenAI)—a shift that goes beyond mere automation and probabilistic models to embrace contextual intelligence. While challenges persist in integrating these technologies with legacy processes, GenAI empowers underwriters with "superhero" capabilities, enabling them to sift through more information than ever before at lightning speed.

The promise is significant. With the right tools, insurers can automate routine underwriting tasks, highlight complex patterns, and free experts to focus on nuanced, high-value strategic decisions. The ultimate vision is a streamlined new business and underwriting process, with every subsector evolving in its own phased journey alongside this disruptive technology. Human expertise remains central—ensuring that clear judgment, critical thinking, and empathy guide every final decision. So, what does the future of underwriting look like across subsectors? Let us dive deeper into a future where underwriters empowered as superheroes thrive, customers benefit, and stakeholders reap the rewards of innovation.

How Generative AI is disrupting underwriting practices

As the insurance industry embraces these technological advancements, the fundamental objective of underwriting stays the same (risk assessment), but the execution of the process is evolving. Context-based large language models (LLMs), agentic-based report workflows, and the ability to intelligently process large documents and unstructured information can exponentially transform ways of working.

Ultimately, the North Star of AI-enabled underwriting is an AI-driven risk assessment and justification generated for review by a human. This evolution requires tailored and incremental technological advancements across property and casualty (P&C), life, and group insurance, along with robust change management procedures to ensure business relevance and scalability of AI initiatives. Here are some examples of first steps toward AI-driven underwriting that you can take based on your specific insurance sector.

Property and casualty

For insurers, obtaining authentic, on-the-ground images that capture subtle details—such as signs of wear, interior layouts, or potential hazards—can be immensely valuable. While underwriters have already started using satellite imagery for property risk evaluation, its insights often still need to be supplemented with what can be observed in person. With generalized multimodal models, a broader array of images, including photos taken by non-experts and potentially sourced from platforms such as social media or the open web, can now be transformed into detailed, actionable insights. However, utilizing such images underscores the critical importance of privacy management to ensure compliance and maintain trust. These high-fidelity, multifaceted property images have the potential to enhance risk evaluation by reducing the need for costly manual inspections and enabling more accurate hazard detection. Ultimately this means, Generative AI can effectively translate the "thousand words" each image represents into coherent, scalable insights—moving from analyzing a handful of photos to thousands, with accuracy and depth that would be unmanageable for humans alone.

This innovative approach not only models individual risk with unprecedented accuracy but also empowers insurers to craft personalized policies that target what customers value most. By aligning coverage with unique lifestyles and personal priorities, insurers can deliver the best-fit policies, streamlining risk evaluation and reducing reliance on broad risk categories. The result is an agile, customer-centric underwriting process that can provide more confidence in assessed risk and resonates with policyholders by reflecting their true needs and values.

Life and annuity

One of GenAI's greatest strengths is its ability to gather insights from large swathes of unstructured text previously inaccessible to automation through use of improved natural language processing (NLP). Leveraging this modality has significant implications on risk assessment, bringing uniformity to one of the most time and labor extensive parts of the underwriting process. Particularly when dealing with the extensive medical records that lay the groundwork for life insurance, these capabilities are essential to increasing the speed and accuracy of the risk assessment process.

The NLP-powered summarization of attending physician's statements (APS) allows an underwriter to input a 100+ page medical document and receive targeted information to aid their decision-making in minutes. Not only does this use case create time and cost savings by reducing manual review, but it will also create a more accurate summary, finding crucial minutiae in massive documents that a human might have missed on their own. Ultimately, the streamlining of risk assessment processes up front will have residual impact, creating structured insights primed for human or automated use and unlocking the possibility of numerous AI use cases downstream.

Building on these summarization capabilities, underwriters can now harness a Generative AI–powered "Underwriter Assist" chat interface. By integrating advanced NLP and contextual analysis, such a system allows an underwriter to ask clarifying questions about complex patient narratives, identify critical health indicators, and uncover nuanced risk factors buried in lengthy medical records. For instance, if an underwriter is concerned about subtle changes in lab results over multiple years, the chat tool can suggest specific follow-up questions and prompt the underwriter to consider associated comorbidities or lifestyle factors. This interactive guidance not only helps underwriters home in on relevant data quickly but also coaches them to think systematically about risk, prompting lines of inquiry that might otherwise be overlooked. As a result, the underwriter gains a more holistic understanding of each case, driving more accurate risk assessment and enabling insurers to maintain a competitive edge while improving the overall customer experience.

Group insurance

Similar use of natural language processing and predictive models can also be applied to group insurance use cases. Personalized risk models in group insurance underwriting leverage machine learning modalities to create customized assessments of risk for different groups based on their unique characteristics and behaviors, in contrast to the broad generalized criteria that define traditional underwriting methods. Because GenAI uniquely lends itself to drawing associations across multiple modes of unstructured data, such as across natural language

and photos, it enables us to pick up on nuances that a traditional underwriter might have missed through initial risk assessments. When presented with more precise information, the human underwriter can make a more informed decision, improving their quality of service. However, when dealing with machine learning models that analyze human characteristics and behavior, one must be consciously vigilant for data bias and must routinely validate that their model is not perpetuating bias in its results, leading to massive inaccuracy and risk propagation. Machine learning models' ability to perpetuate patterns can also be extremely helpful: over time, personalized risk models will continuously learn and adapt as new data becomes available, ensuring their near-to-long-term health and functionality.

Another use of natural language processing capabilities is for data retrieval, an essential part of underwriting that currently takes up a large amount of time. Deloitte offers a modality called "Talk to My Data," which allows a user to connect to a large data set and enter queries about the data set into the NLP model in their natural language structure. In this case, GenAI functions as a database librarian: You can "talk" to it and, in turn, it will retrieve the data that you need from a massive data set or resource repository. This tool has shown promise with mortality tables but can expand to other underwriting resources in the future. Additionally, an underwriter could use it to navigate their past cases to validate a current assessment: NLP can enable an underwriter to query past loss experiences based on their repository of past cases and their attributes.

On the horizon: AI agents in underwriting

As the insurance industry continues to evolve with technological advancements, the integration of AI agents presents a significant opportunity to enhance underwriting processes.

- AI agents can serve as virtual assistants, providing real-time regulatory updates and recommendations on gaps observed with policy updates.

- AI agents can act as virtual librarians, retrieving relevant data from extensive and unstructured data sets based on natural language queries, help underwriters prioritize their backlog and tasks, empowering them to focus on more critical tasks and upskill for greater impact.

With AI agents coming in, underwriters have assistant thought partners allowing them to focus on high-value strategic decisions while agents help them prioritize and recommend next steps on individual case files based on prior learnings, ensuring a more efficient, accurate, and customer-centric underwriting process. To effectively integrate AI agents into existing workflows, it is important to develop a strategic roadmap that clearly demonstrates return on investment, aligns activities with efficiency gains, and supports adaptive and scalable implementation.

Regulatory considerations

The integration of AI into insurance underwriting offers significant efficiency and accuracy improvements but introduces complex regulatory challenges, particularly in the United States, where insurance regulation is state-driven.

National Association of Insurance Commissioners' (NAIC) 2025 initiatives[1] and impact on underwriting

- **Enhanced communication and education**: NAIC's focus on improving communication strategies has the potential to better inform consumers and stakeholders, increasing transparency and trust in underwriting processes.

- **Strengthened financial governance**: Modernizing the risk-based capital (RBC) framework and addressing regulatory risks have the potential to provide a stable financial foundation, improving risk assessment and management in underwriting.

- **AI and technology prioritization**: Emphasizing AI and emerging technologies has the potential to standardize and enhance AI-driven underwriting, ensuring responsible and effective use of new technologies.

Insurance regulation in the United States is primarily on a state-by-state basis, with each state having the authority to regulate insurers within its jurisdiction. Ultimately, the NAIC provides recommendations, but it is up to the states' discretion whether to adhere or branch off in a different direction.

For example, in 2024, many states, including Illinois and Pennsylvania, issued bulletins in general alignment with the NAIC's model bulletin.[2] However, some states, such as Colorado and New York, have taken different regulatory approaches.
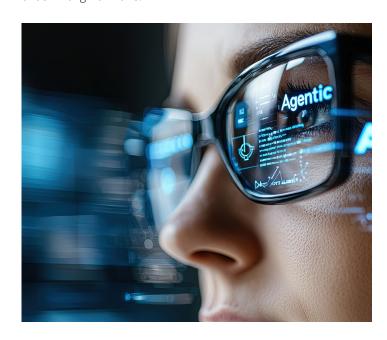
- Colorado implemented one of the most clear-cut stances on AI in underwriting with SB24-205 "Consumer Protections for Artificial Intelligence"[3] that, among other requirements for developers and deployers, requires companies to inform consumers when an AI system is being used, and allows them to raise a complaint if they believe they have been treated unfairly as a result. This bill effort is still a work in progress and is scheduled to go into effect in 2026.

- The New York State Department of Financial Services issued a circular letter entitled "Use of Artificial Intelligence Systems and External Customer Data and Information Sources in Insurance Underwriting and Pricing"[4] that builds upon the NAIC's model bulletin, with specific focus on the use of AI systems and external third-party customer data in underwriting and pricing processes.

The letter focuses on what steps should be taken to mitigate data bias and discrimination within AI system usage, specifically as it relates to underwriting and pricing for protected classes of individuals, and sets the expectation that an insurer must be able to describe how their AI system operates and protects against data discrimination. It also instructs that, if an insurer is using an AI system in its underwriting or pricing process, it must be transparent about its use within the underwriting process, whether it processes third-party data about the customer, and customers' right to request the data that resulted in an underwriting or pricing decision.

These state-level regulation specifications are important to define the roadmap, strategy, and implementation of GenAI capabilities into underwriting workflows. And it will be critical to build robust validation systems that monitor GenAI-enabled process flows against the regulation context they should be compliant with.

Outlook

There is a cautious optimism about the future of AI in insurance underwriting. A key for firms racing to add AI to their toolkit is to balance that enthusiasm with a realistic understanding of risk management and enabling the ability to follow current regulations and standards. Human oversight will remain crucial, especially for complex cases, and will facilitate the lasting impact of AI in underwriting workflows.

Conclusion

On the human side, the potential impact on consumers is profound. Imagine a world where underwriting delays are minimized, allowing individuals and businesses to secure coverage swiftly and efficiently. AI-driven underwriting can lead to more sophisticated means of tailoring policies and pricing, reflecting a deeper understanding of the risk profile of the customer, helping to make insurance more accessible and affordable.

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Endnotes

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