

AI transformation in insurance underwriting

Unlocking the power of predictive models



The dawning of a new artificial intelligence era

From automated cars to facial analytics, artificial intelligence (AI) is taking the world by storm. Every industry is facing some degree of disruption and insurance is no exception. The most innovative firms have started to embrace AI with 52 percent of respondents in the KPMG global tech report 2023 picking AI as the most important technology in helping them achieve their ambitions over the next three years¹.

In many ways, insurance and underwriting is a prime candidate for AI disruption. AI is facilitated by massive amounts of data, which the insurance industry has in spades. At the same time, many insurers struggle to make use of their treasure troves of data. Even if an organisation's drive to become AI-enabled is strong, there are significant barriers to overcome.

“Organisations can improve operational efficiency by leveraging AI and machine learning to streamline business processes. Big data can be used to improve risk prediction accuracy, gauge intent and sentiment, identify cross-selling opportunities and delight users with personalised experiences.”

Patrick Greene

VP of Data

Munich Re Automation Solutions

¹ <https://kpmg.com/xx/en/home/insights/2023/09/kpmg-global-tech-report-2023.html>



Where can predictive models be used?

By leveraging predictive models trained with historical data, AI can perform many tasks faster, more efficiently and more cost-effectively than humans. For example, AI models can be used to accelerate the underwriting process, develop more personalised marketing campaigns, streamline the claims process, and detect fraud. This means that thanks to effective use of AI, insurers can release their human workforce to work on complex use cases and verification of AI decisions.

Underwriting

Historically, underwriting was a slow process with organisations required to manually process and analyse data before issuing policies. Risk assessment was carried out by cross-referencing a customer's information with other available data, often in a non-automated way. Not only was this a lengthy process requiring significant labour costs, but there was a high probability for human error.

Through using AI, underwriters can optimise these processes to deliver more accurate outcomes in just moments, increasing straight-through processing (STP). Underwriters can carry out full model decisioning of underwriting decisions using historical data, and AI can be leveraged at various stages in the point-of-sale (PoS) process. As an example, facial analytics tools can be used to detect body mass index (BMI) upfront. Underwriters can also use a combination of predictive models, natural language processing (NLP) and even large language models (LLMs) to accurately summarise documentation such as attending physician statements (APS).

Customer service

According to the results of a 2021 PwC survey², the most effective use of AI in insurance is in the customer experience space.

²<https://content.naic.org/cipr-topics/artificial-intelligence>

By offering a more personalised service and removing unnecessary questions from the process, insurers can reduce friction and improve the customers' experience. AI-assisted risk assessment can help insurers to better customise their plans, so customers pay only for what they need.

By leveraging chatbots and other AI tools to guide customers through simple queries, organisations can significantly reduce time and effort for both parties. Insurers can therefore decrease labour costs, allowing their customer service agents to work on complex cases that require human oversight.

AI enables insurers to deliver a seamless, more personalised experience which increases customer satisfaction and retention.

Claims management

AI has vast potential to improve both the speed and accuracy of the claims management process. AI tools can be used to automatically read, interpret, and process documents and photographs, such as to extract the information needed from medical records or identity cards. In the car insurance industry, users can upload images of damage via a smartphone app and insurers can use machine learning models to assess the severity of the damage. Humans can then assess the system's automated results to verify them and quickly settle the claim. AI can therefore allow claims to be processed and paid faster, enhancing the customer experience.

Marketing

Machine learning and data analytics support marketing teams to gather precise insights about customers that were not previously possible. Through using AI to generate more accurate customer profiles, insurers can offer fairer prices that are more personalised to the individual – for example reduced premiums for policyholders with healthier lifestyles.

Personalising insurance products using AI offers significant benefits to both customers and insurers. Customers get the coverage they need at a fair price and insurers can operate competitively within the market. However, insurers must also be aware of the risks associated with personalisation in terms of privacy and potential bias. They must ensure that they always follow responsible AI practices to mitigate these risks.

Fraud detection

In 2022, UK insurers detected 72,600 dishonest insurance claims valued at £1.1bn³. Fraud detection is a key focus area for insurers, but traditional rule-based fraud detection systems are expert-driven and costly to run. Investigating a single potential fraud case can prove cost prohibitive. Thankfully, fraud detection is yet another area that AI can support.

Insurers can use AI-driven fraud detection solutions to analyse enormous amounts of data from various sources and flag unusual patterns that a human might easily miss. For example, AI can be used to analyse documents and images related to a claim to identify potential indications of fraud. Pattern recognition on vehicle damage data can be used to detect cases of car insurance fraud that would not be recognisable under previous systems. AI software can also flag manipulated images or other suspicious indicators.

However, fraud methods are constantly evolving. The future of insurance fraud detection will involve human data scientists constantly iterating their analysis, while AI models and machine learning algorithms train themselves over time based on changes in the data.

³<https://www.abi.org.uk/products-and-issues/topics-and-issues/fraud>

Key challenges facing insurers

There are several barriers preventing insurers from implementing AI models. AI capabilities have increased rapidly over the last few years and insurers have struggled to build them into their business-as-usual processes.

Tools

AI is a fast-moving space, and the industry is flooded with one-off tools performing point solutions, each with their own bespoke data set. These tools also tend to be technical in nature, making it difficult for non-technical underwriting teams to understand and use them. It is challenging for insurers to ensure that the right teams have the right knowledge, enabling the organisation to gain the most out of each tool.

Data

Insurers are hindered by the fragmented, siloed nature of their data architecture.

They face issues with combining data sets across the application lifecycle, and third-party data adds further complexity.

Data should be labelled and structured in a way that can be easily understood by data scientists – clean, validated, labelled and accessible in easily consumable ways, for example via SQL, API, and CSV.

Talent

A survey⁴ carried out by Deloitte with global insurance analytics leaders, talent ranked third on the list of concerns. The insurance sector has many skilled teams of experts for exploratory data analysis, as well as data engineers and DevOps to manage lifecycle. However, it is difficult to find a good mixture of domain-specific knowledge and data science.

⁴<https://www.deloitte.com/cbc/en/our-thinking/insights/industry/financial-services/insurance-data-as-a-strategic-asset.html>

Regulation

Even before the advent of AI, insurers operated within a complex legislative and regulatory environment. As AI becomes more commonplace within the industry, it is naturally falling under increased scrutiny by global regulators. Organisations must ensure responsible and ethical use of AI, as well as transparency of model decisioning, explainability and tracking of data privacy.

In the US, The National Association of Insurance Commissioners (NAIC) released its non-binding 'Principles on Artificial Intelligence' covering individuals applying for insurance. With these principles, the NAIC aims to ensure that insurers use AI responsibly and promote fairness, accountability, transparency, and legal compliance⁵.

The European Commission's AI Act⁶ (approved by legislators in March 2024) promotes similar principles of safety, ethics, transparency, and accountability. The EU has categorised the insurance industry as high-risk, which means it is subject to increased scrutiny and audit capability relating to decisions made by predictive models and machine learning systems. Failure to comply with the rules can lead to significant fines.

⁵https://content.naic.org/sites/default/files/inline-files/AI%20principles%20as%20Adopted%20by%20the%20TF_0807.pdf

⁶<https://digital-strategy.ec.europa.eu/en/policies/regulatory-framework-ai#:~:text=The%20AI%20Act%20is%20the,play%20a%20leading%20role%20globally.&text=The%20AI%20Act%20aims%20to,regarding%20specific%20uses%20of%20AI.>

Building a responsible AI ecosystem

The term 'responsible AI' refers to designing, deploying, and developing AI systems with good intention. It covers ethical issues relating to the fairness of data usage, as well as potential issues relating to its transparency, performance, explainability and auditability. Responsible AI is managed through regulation, corporate responsibility, and personal responsibility.

FEAT

The concept of 'FEAT' (Fairness, Ethics, Accountability, and Transparency) is integral to responsible AI practices. Each component of FEAT addresses a specific aspect:

Fairness

Fairness relates to the importance of avoiding biases in AI systems and ensuring that the outcomes do not disproportionately favour or harm specific protected individuals or groups.

Ethics

Ethical considerations in AI involves ensuring predictive model decisioning is held to the same standards as human decision-making. These considerations include issues such as consent and data privacy.

Practising ethical AI is likely to involve humans-in-the loop, to verify decisions made by AI and ensure that their broader implications are always considered.

Accountability

Accountability in AI relates to establishing human responsibility for the development, deployment, and impact of AI systems. Individuals responsible for AI systems must be able to explain their models' decisions and ensure clear lines of responsibility and mechanisms for managing errors or unintended consequences.

Transparency

Insurers must guarantee that AI systems are built on principles of openness and clarity. Data must be auditable so it is clear why a model made a certain decision, and the decision-making process of AI algorithms must be fully understandable and explainable.

Failure to adhere to local responsible AI guidelines could lead to serious consequences for insurers such as reputational damage, bias in decision-making, and legal action. Development of responsible AI frameworks is therefore mission critical.

Ensuring explainable AI

Modern AI and machine learning models tend to work within a 'black box,' meaning that hundreds of data points are working together in complex ways that are not easily understandable by a human. As trust in AI solutions requires transparency, insurers must be able to explain how AI models use the data available to reach fair and ethical decision-making. Explainable AI accounts for the tools and processes insurers put in place to ensure that models' decision-making can be interpreted by a human.

Model accuracy

The accuracy of a predictive model is dependent on the historical data it has been trained on. If an insurer's way of operating changes for any reason, the model may start to drift and give unexpected decisions. Insurers therefore need tools in place to monitor for model drift.

Bias detection

AI algorithms are complex and opaque, which can make their results difficult to understand. This can give rise to either explicit or implicit biases. Explicit bias refers to decision-making that discriminates on known factors such as ethnicity, gender, or age. Implicit bias is built into data sets because of historical data and is not known to the human observer. Both explicit and implicit biases can be inherent in AI, so insurers must take steps to always ensure its explainability and transparency.

The role of MLOps

Machine learning DevOps (MLOps) is a specialised subset of AI and DevOps tailored to produce ML (machine learning) applications. Modern MLOps practices monitor model performance and continuously retrain AI models to ensure they perform as expected. They also enable effective management of risk implications for future claims experience. MLOps is both a technological and cultural shift that requires the right people, processes, and tools to successfully implement.

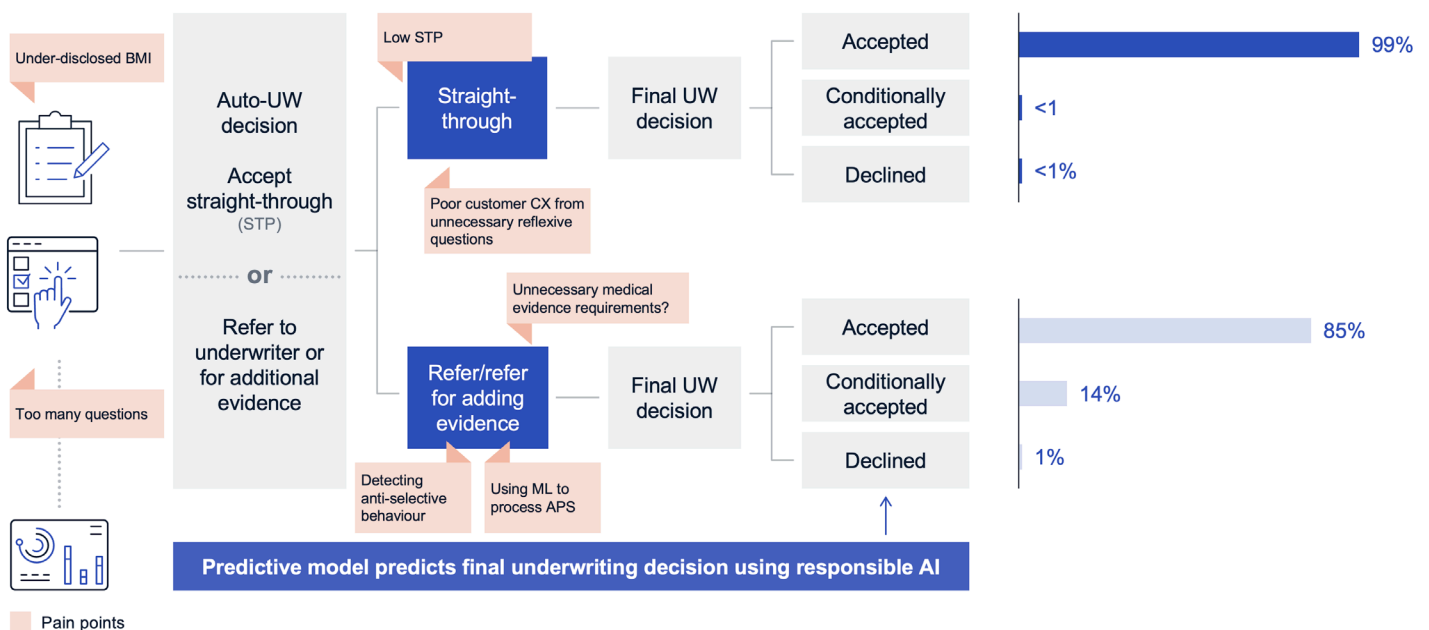
The power of AI-driven augmented underwriting

By working with technology partners, underwriters can unlock the value within augmented underwriting. The diagram below highlights how AI can drive improvements and efficiencies in managing evidence to make faster, more accurate decisions. The automated tool removes unnecessary questions and provides personalised ones, thus reducing friction and boosting the customers' experience.

Finally, it identifies possible non or false disclosure at the point-of-sale.

Ultimately, augmented underwriting increases STP, reduces the need for manual underwriting, while still considering compliance and minimising risk. It reduces time and cost associated with integrating predictive models within point-of-sale underwriting and increases the cost-effectiveness of medical evidence.

Augmented Underwriting with AI



The time to act is now

The insurance landscape is currently undergoing some of its biggest transformations to date. Rapid advances in AI technologies over the coming years will continue to disrupt the industry, and organisations must embrace change to keep up. Shifts towards digitalisation are no longer enough – leaders must step up their data science game or risk falling behind.

The good news is, technology partners are ready to do the heavy lifting, enabling insurers to adopt AI capabilities with minimal disruption.

“73% of US companies have already adopted AI in at least some areas of their business.”

2023 Emerging Technology Survey
PwC⁷

ALLFINANZ Predictor

With more data available today than ever before, insurers are looking to move beyond traditional underwriting to embrace predictive technologies.

As an additional module in combination with ALLFINANZ SPARK and NOVA, ALLFINANZ Predictor enables you to embrace predictive technologies that span data preparation, model deployment, integration, and performance monitoring, with a proven ability to increase straight-through processing rates, reduce the need for evidence collection, and deliver a better customer experience.

Combine AI-technology and data to integrate predictive models into your existing underwriting journey.

Future-proof your business by enabling your path to an augmented underwriting future.

⁷<https://www.pwc.com/us/en/tech-effect/emerging-tech/emtech-survey.html>

Tailor underwriting processes to your specific needs, reduce time and cost to integrate predictive models to POS underwriting, and get instant data on how models are performing.

Predictor Modules

Transform accelerates the entire process of data discovery so you can rapidly develop predictive models.

Cloud streamlines model deployment in our secure cloud solution ensuring you get the availability, performance, and security you need.

Connect simplifies the process of integrating your model with your production without the need for any code integration, ensuring you remain in control at all times.

Vision enables you to clearly monitor performance with dedicated dashboards and key reports available right out of the box.

Predictor Benefits

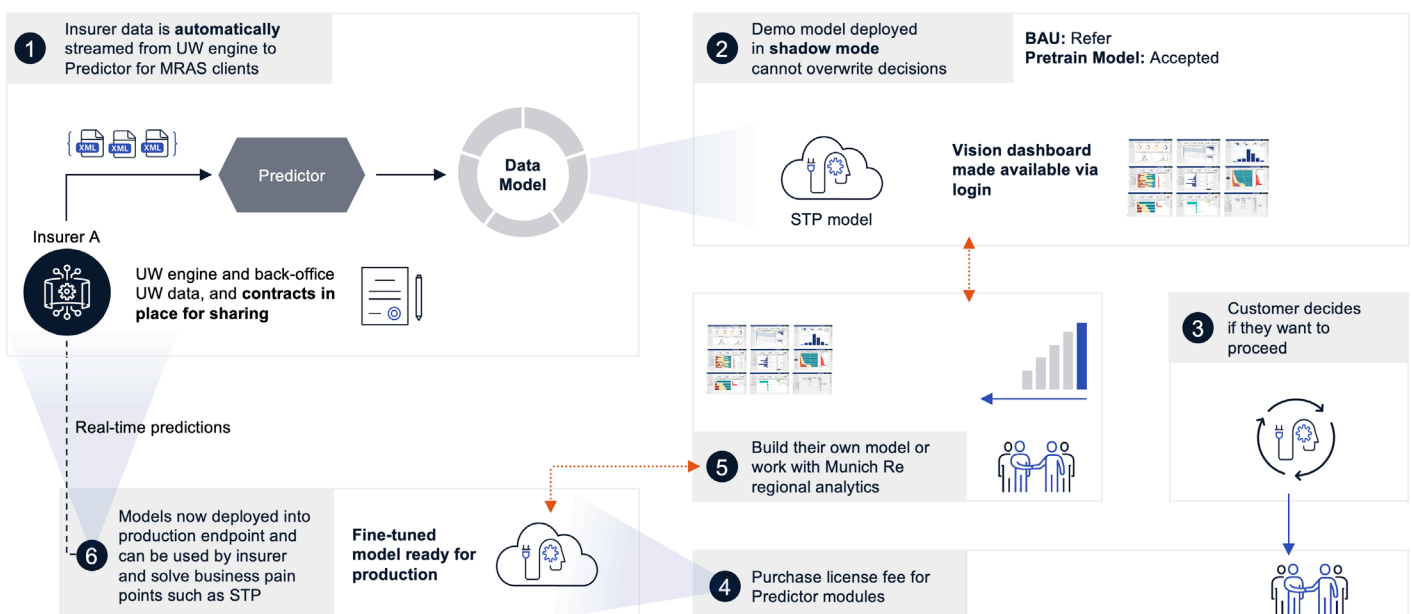
Help deliver increased straight-through processing by improving the decision-making process, and reducing the need for manual underwriting.

Support improvements in managing evidence, indicating where additional information is required.

Streamline the UX by providing personalised questions or removing unnecessary questions.

Identify possible false or non-disclosure at the point of sale.

Predictor in Demo Mode



Munich Re

AI transformation in insurance underwriting:
Unlocking the power of predictive models

Learn more about ALLFINANZ »

If you're ready to revolutionise how you do business, we should talk. Contact us for an initial conversation about your needs at letstalk@munichre.digital, or call your nearest office:

Europe/US/Singapore: + 353 1 293 2888

Australia: + 61 2 8404 9200

Japan: + 81 3 4550 1550

About Munich Re Automation Solutions

Munich Re Automation Solutions, is the world leading provider of digital new business, underwriting and analytics solutions to the insurance industry. Working with forward-thinking customers across the globe, we're on a mission to revolutionise the way life insurance is bought and sold, using next-generation technology to give insurers the power to grow their businesses profitably.

Learn more at munichre.com/automation-solutions

© 2024

Münchener Rückversicherungs-Gesellschaft
Königinstrasse 107, 80802 München, Germany

Münchener Rückversicherungs-Gesellschaft (Munich Reinsurance Company) is a reinsurance company organised under the laws of Germany. In some countries, including in the United States, Munich Reinsurance Company holds the status of an unauthorised reinsurer. Policies are underwritten by Munich Reinsurance Company or its affiliated insurance and reinsurance subsidiaries. Certain coverages are not available in all jurisdictions.

Any description in this document is for general information purposes only and does not constitute an offer to sell or a solicitation of an offer to buy any product.