AI in Insurance: Developing a Robust AI/ML Strategy

How insurance organizations can deploy emerging AI/ML technologies to manage increasingly complex tasks while decreasing risk.

Insurance companies, once notorious for their reluctance to adopt new technologies, are now embracing AI rather than relying on outdated manual processes and legacy systems. Today, many insurance companies are approaching the forefront of technological innovation, harnessing the power of artificial intelligence (AI) and machine learning (ML) to revolutionize their operations and enhance customer experiences.

The Evolution of AI in Insurance

Over the past decade, AI/ML technologies have steadily made inroads into the insurance sector. Initially adopted for automating routine tasks and boosting operational efficiency, these technologies have evolved to address more complex functions such as intelligent underwriting, automated claims processing, and risk management.

Several factors have fueled the adoption of AI/ML in insurance:

1 The explosion of data sources from policyholder records, medical histories, and even social media has provided a fertile resource for AI algorithms.

2 Advances in computing power have enabled the processing of vast data sets and the training of intricate models.

3 Heightened competition within the insurance market has pushed insurers to innovate. Companies are seeking new ways to stand out and deliver superior customer experiences while, at the same time, reducing costs.

Recent Applications of AI in Insurance

AI-driven applications in the insurance industry are increasingly diverse and impactful, reshaping the landscape from operations to decision-making processes. This section highlights some of AI's most prevalent and transformative uses, illustrating how these advanced technologies are currently revolutionizing various aspects of the business, going beyond machine learning to more closely simulate human behavior and decision-making.

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1. **Underwriting and Pricing:** Traditional underwriting has long been a labor-intensive process that relies heavily on the expertise and judgment of human underwriters. AI is beginning to automate this process by analyzing vast amounts of data to assess risks associated with a potential policy. For example, machine learning algorithms can predict life expectancy based on lifestyle habits, anonymized medical history, and genetic information, leading to life policy pricing more reflective of the individual, the risk, and other key factors. These automated activities speed up the underwriting process, but also reduce the likelihood of human error and bias. Swiss Re, for instance, is currently piloting Swiss Re Life Guide Scout. This generative AI-powered assistant supports underwriters by speeding up risk assessments and unlocking insights for improved human decision-making.[1] In another example, Nationwide Insurance uses DigitalOwl's AI-powered platform to enable efficient processing and analysis of large volumes of medical records (conventional and electronic), helping life underwriters quickly assess the holistic view of an applicant's medical history and the impact of an entirely new dimension of data relative to the coverage desired.[2]

2. **Claims Processing:** Claims processing has historically been a pain point for insurers and policyholders alike, often involving manual activities, forms, lengthy adjudication processes, and the potential risk for fraud. AI is streamlining claims processing in many ways, including the use of AI algorithms to quickly cross-reference claims with historical data to score and identify anomalies. This helps reduce the risk and time required for claims settlement. AI also helps by automatically determining where information is missing in a claim and either locating it or automatically reaching out to the proper parties to more quickly secure the needed information.

3. **Fraud Detection:** AI is currently trained to look for behaviors that suggest the potential for fraud by analyzing patterns in the data that traditionally accompany suspicious activity, including multiple policies in force on the same individual, or, conversely, a single beneficiary listed to numerous policyholders. On property or casualty claims, vendors not geographically near a property damage claim could be part of a claims scheme, just like repair costs at a repair shop that are higher than known industry standards could indicate potential fraud and be flagged for further investigation.

4. **Customer Service:** AI-powered chatbots and virtual assistants are revolutionizing customer experiences, particularly in the life and personal lines sectors. These tools provide 24/7 customized support, answering queries, assisting with policy selection, and guiding customers through the policy purchase or claims process before involving a person. AI's ability to analyze customer data during the interaction and offer personalized policy recommendations in real time ensures that customers receive the most information or suitable coverage for their situation while enhancing customer engagement and fostering loyalty.

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[1] "Swiss Re launches Swiss Re Life Guide Scout, a Generative AI-powered underwriting assistant," Swiss Re Group, April 22, 2024, www.swissre.com/press-release/Swiss-Re-launches-Swiss-Re-Life-Guide-Scout-a-Generative-AI-powered-underwriting-assistant/d0d00d41-755c-4f0b-8bba-95a39b6fc21d.

[2] "Nationwide Is Streamlining Life Underwriting Process with DigitalOwl's Advanced AI Technology," Nationwide, n.d., accessed August 2, 2024, https://news.nationwide.com/nationwide-is-streamlining-life-underwriting-process-with-advanced-ai-technology/.

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5. **Policy Administration:** Policy administration involves routine tasks, including policy updates, renewals, and cancellations. When done manually, these tasks are expensive for the carrier and time-consuming for all parties. AI has automated many of the basic tasks, allowing staff to reduce errors and focus on more complex tasks, thereby improving efficiency and enhancing the accuracy of policy administration.

6. **Marketing and Sales:** Marketing and sales support are already areas of additional opportunity for AI to provide easy-to-achieve, robust benefits. AI is analyzing customer data to identify potential leads, predicting customer behavior and personalizing marketing messages to increase sales and customer retention. If a customer has recently purchased a house, the AI system of one large insurer already recommends new dwelling coverages, customized to the risk profile of the insured in their last residence. In addition, it can suggest possible revisions to auto policy rates and increased life insurance needs if there is a requirement to address any life events. All these actions are driven by data sets that, when used in relation to other data sets, paint a customized marketing and sales event profile designed to drive more positive outcomes for the customer and the carrier.

7. **Risk Management:** Risk management is a critical function in the insurance industry. AI's ability to analyze large data sets and identify patterns driving risks and claims makes it a powerful tool for risk management and predictive analytics. Both life and property and casualty insurers are leveraging early instances of AI to identify emerging risks and trends, including risks caused by the environment. This allows a carrier to adjust their risk management strategies proactively as the risk landscape changes. In one example, AI is identifying health trends to better anticipate and reserve for future claims exposures, shaping pricing models in real time to achieve better business outcomes for the company and the insured.

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Additional Areas for AI Application or Expansion

The previously mentioned use cases highlight the more conventional and immediate benefits that AI/ML is bringing to traditional insurance functions. However, AI offers intriguing opportunities for those willing to venture beyond the norm. By thinking outside the box, insurers can unlock additional advantages that may justify their investment in AI and pave the way for innovative growth and competitive differentiation.

1. **Lapse Prediction:** Since AI can analyze vast amounts of data quickly, and then tie it to human behaviors, leveraging policyholder demographics, policy details, and behavioral patterns can allow AI to manage the risk of a policy lapse better than is currently possible. Insurers can then be notified to engage with at-risk individuals earlier in the transaction cycle to prevent some of the churn that all insurers suffer from lapses in policies.

2. **Health Monitoring:** Safe driving apps and behavior monitoring tools have been around for some time, offering discounts for preventative actions that lower the risk of a claim. Similar health apps exist to assist people with their life and health behaviors, positively impacting related personal metrics and insurance rates. AI also ingests and analyzes real-time health data provided by wearable technology, driving more accurate pricing and better health outcomes for policyholders. One example of the next level of AI is John Hancock's integration of wearable technology into its Vitality program. Policyholders who opt into this program use a Fitbit or Apple Watch to track their physical activity and other health metrics in their customized program. Policyholders then earn gamification-style points by meeting specific health goals, including "steps per day" levels or participating in regular workouts. These points are redeemable for policy discounts or other rewards.[3]

3. **Social Media Analysis:** AI has the capability to analyze publicly available social media posts shared by users. For example, if a life insurance applicant indicates they are a non-smoker on their application but has public posts they have made referencing their personal smoking activities, AI can correlate this information and flag the inconsistency for further review by the underwriting team. However, there is ongoing debate about the ethical and legal dimensions of using social media data in underwriting decisions, and related insurance practices involving AI continue to evolve.

4. **Document Analysis:** AI automates the ingestion, interpretation, categorization, and analysis of documents, including medical records and policy forms, speeding up underwriting and claims processing and reducing the risk of errors in decision-making. More data normally equates to better decisions. Unfortunately, it also traditionally equates to not only slower responses from claims functions, thereby frustrating claimants, but also slower decisions from an underwriter, which could lead to the loss of a sale to a firm that can make faster decisions about a risk. AI infused into the proper customer interactions can help speed up the decision-making process while providing more insights, particularly when ingesting unstructured data and getting it into an underwriting or claims processing engine.

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[3] "John Hancock Redefines Life Insurance with Vitality Program," The Digital Insurer, n.d., accessed August 2, 2024, https://www.the-digital-insurer.com/dia/john-hancock-redefines-life-insurance-with-vitality-program/.

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5. **'Structuring' Unstructured Data:** Even today, insurance is a 'paper-heavy' industry. One area with material paper drag is reinsurance treaties, where documents written decades ago could still be in effect, and each treaty has its own rules for administration. These treaty documents often have unique formats and rules around rating, ceding, limits, table rates, and other factors. Capturing this data in a more AI-friendly, structured form could help with administration, validation, and auditing, thereby reducing errors that could result in severe financial impacts years after the documents are signed or processed. AI tools that can read and understand these documents, extract critical elements for proper administration, and determine the best next step or process are evolving as AI penetrates more insurance processes beyond early use cases.

6. **Catastrophe Modeling:** Though often associated with property and casualty insurance, catastrophe modeling enabled with AI holds significant value for life insurers as well. By leveraging diverse data sources, such as epidemiological records, social media trends, and health data, AI can enhance the depth of analysis into a risk and therefore the prediction of pandemics and other catastrophic events' impacts on mortality. Sophisticated models with AI at their core can uncover patterns and correlations that traditional actuarial methods might overlook, or never see in our lifetime, refining risk management and pricing strategies for the policies they are associated with.

Critical Considerations Before Making the Leap

Before embarking on a sweeping plan for implementation of artificial intelligence within an organization, management should carefully consider several essential factors. These considerations can significantly impact the cost and success or failure of the AI endeavor, making the following factors crucial to the decision-making process:

- **Enterprise Data Quality:** The quality of data used to train AI models is integral to the performance of the models themselves. Insurers need to guarantee that they have access to clean, high-quality, unbiased, and representative data. Over-fitting or under-fitting are common problems and will lead to biased results if not managed properly.

- **Infrastructure:** Implementing AI requires a robust, modern IT infrastructure capable of handling large amounts of data and complex computations efficiently. Depending on your location on the systems and automation spectrum, this might require significant upfront investment, which some insurers may be reluctant to make.

- **Skills and Expertise:** AI requires expert skills not typically found in traditional insurance organizations making the leap into specialized AI processing. Insurers need to consider whether to buy or build AI technologies—and a key part of that decision is whether they have the necessary in-house expertise and budget needed to hire the best AI talent.

- **Regulatory Compliance:** The use of AI in certain areas, especially those involving personal data, is subject to heavy regulation. Insurers must make sure their use of AI as part of a business process is compliant with all relevant laws and regulations. In a heavily regulated industry like insurance, it is best

to understand the rules, the business needs of the group adopting AI, and the potential regulatory impacts of business decisions before investing in something as transformational as AI automation.

- **Ethical Considerations:** AI raises many ethical questions, including how to address the potential for bias in decision-making. There are also considerations around AI's impact on human jobs. Insurers need to consider how they will address internal and external challenges to an AI strategy and how their reputation may be at greater risk should a leap into deeply AI-enabled operations be taken.

- **Transparency and Explainability:** AI models can sometimes appear to be 'black boxes,' making it challenging for auditors, regulators, or even internal functions to understand how decisions are made. Traditional code-driven decisions are traceable to an 'if/then' tree, but AI decisions remain more of a mystery. In regulated industries, additional transparency supporting AI-enabled decisions is expected. Insurers therefore need to consider how they will provide transparency and explainability of their AI models and any decisions that may come out of them.

- **Cost vs. Benefit Analysis:** Implementing AI can be expensive, not just in terms of the initial technology investment, but also in the ongoing maintenance and updating of models driving processes or experiences. Insurers must conduct a thorough cost vs. benefit analysis within processes under AI consideration to ensure that the benefits of implementing AI will be greater than the costs. Only when benefits clearly outweigh costs should AI be the answer.

- **Change Management:** As AI is integrated into any business process, insurers need to have solid change management procedures in place. AI and intelligent workflows will likely drive significant changes to insurance processes. Insurers must therefore have a plan to account for and manage these changes to minimize disruption to the service at hand while ensuring a smooth transition from the former process to one driven by AI.

- **Security:** Without proper security in place, AI is vulnerable to attacks that manipulate its output or alter the conclusions made. In addition to hackers who may try to steal data, bad actors may attempt to break in to 'poison' data or disrupt the AI process, causing a model to provide erroneous or biased results. Insurers need to consider how their security is structured to protect their AI corpus today, and what security parameters need to change to properly address future vulnerabilities or risks caused by the use of AI models.

The insurance industry is on the brink of a technological revolution, with AI set to transform risk management, administration, and operational efficiency. Organizations need increasingly sophisticated tools to gain insights from their customer data, streamline operations, combat fraud, realize cost savings, and connect with customers. Now is the time to embrace these technologies and secure your competitive edge in the digital insurance landscape.

Our Guidehouse experts have extensive experience helping our clients implement AI technologies for a range of functions, from managing data and bolstering overall efficiency to improving customer service, compliance, and cybersecurity. With skilled teams able to address complex industry-specific challenges via AI, we offer tailored programs for insurance companies at every stage of their AI transformation. Contact Guidehouse to explore the many ways your organization can benefit from a robust AI strategy.

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