

## INSURANCE DATA AND AI TRENDS

How data and analytics continue to transform the insurance industry

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# A RAPIDLY EVOLVING INSURANCE LANDSCAPE: GENERATIVE AI

Insurance companies that want to thrive in today's aggressive global business landscape need to leverage data and analytics better than ever before. Insurance providers must know more about the marketplace than their competitors, be able to share and leverage information internally and externally with simplicity and ease, and integrate analytics insights into every step of the decision-making lifecycle.

For many, generative AI (gen AI) offers the transformative technology that will enable insurers to derive business-critical outcomes while also focusing on organizational cost reductions and efficiencies. But while 2023 was the year of hype and the "art of the possible," now insurers must quickly learn to navigate the potential complexities of gen AI — and figure out how to effectively implement it.

The good news is that insurance firms don't have to go it alone. Today, there are cloud-based SaaS data platforms that enable insurance organizations of any size to build foundational data, Al and analytics capabilities so they can confidently and profitably move forward and prepare for whatever is next.



## IDENTIFYING THE BIGGEST EXTERNAL CHALLENGES FOR INSURERS

The insurance industry as a whole has been impacted by enormous challenges on a global scale over the past few years — a global pandemic, inflation and labor challenges, not to mention political and civil unrest — and they affect everything from fuel costs to global supply chains.



#### **EXTREME WEATHER**

Climate-related issues pose a particular uncertainty for insurers. 2023 was marked by an unprecedented number of extreme weather events, surpassing historical records and highlighting the intensifying impacts of climate change. In the United States alone, weather and climate disasters cost at least \$92.9 billion across 28 separate events — the highest number of billion-dollar disasters in a calendar year.

Such industry data highlights the increasing frequency and severity of these natural disasters, particularly in secondary perils such as wildfires, drought, hail, flash floods and severe convective storms.

In light of the scale of devastation caused by these secondary perils, it is clear that insurers must apply the same disciplined risk assessment as to primary perils such as earthquakes and hurricanes. Given the dynamic nature of these risks, data-driven models with long-term scenario analyses, stress tests, and reporting requirements for climate risk management will become essential tools in properly estimating the scale of potential losses.

#### **ECONOMIC INFLATION AND SUPPLY CHAIN**

The property and casualty sector continues to be under significant performance constraints driven, in large part, by several factors putting pressure on loss costs.

In particular, economic inflation continues to have a significant impact on replacement and repair costs for both auto and property lines of insurance.

Between 2020 and 2023, P&C replacement costs increased by an average of 45%, outpacing the overall U.S. economy's inflation rate, which increased by 15% during the same period.

Supply chain disruptions contributed to this dramatic increase in loss costs, leading to issues such as delayed parts delivery, longer repair times and increased duration for vehicle rentals.

#### **SOCIAL INFLATION**

The term *social inflation* refers to the legislative and litigation-driven increases in the legal liabilities and claims costs of insurers above and beyond those driven by economic inflation. The impact of social inflation on loss costs in the insurance industry has been significant, with evidence suggesting that it has led to a notable increase in claim costs beyond general economic inflation. Specifically, social inflation has been causing losses to increase faster than general inflation by an estimated 2% to 3% per year according to data from the Casualty Actuarial Society.

This trend has been observed across various liability insurance lines, including commercial auto liability, medical malpractice, general liability and personal lines, indicating a broad impact on the industry.

#### POST-PANDEMIC CONSUMER BEHAVIOR

In addition to the impacts of economic and social inflation, auto lines are under significant pressure due to what appears to be a post-pandemic change in driving behavior, leading to increases in the frequency and severity of private passenger collisions and bodily injury claims.

As miles driven on U.S. highways dramatically decreased during the peak of the pandemic, the Insurance Institute of Highway Safety analyzed data from more than 500 Virginia Department of Transportation speed counters and compared the proportion of vehicles exceeding the speed limit by 10 mph from March–June 2020 with the same period in 2019.

They noted a 50% greater likelihood that a driver was traveling 10 or more miles per hour above the speed limit in 2020 than in the same period in 2019.

As motorists returned to the roads and the number of miles driven approached pre-pandemic levels, it would appear that driving behavior has NOT returned to pre-pandemic norms. In a report issued by telematics service provider Cambridge Mobile Telematics, they noted that distracted driving behaviors have intensified at an alarming rate over the last two years.<sup>2</sup>

This riskier driving behavior is manifesting in increased claims severity, with private passenger collision severity increasing 36.5% in 2021 vs. the same period in 2020, and average bodily injury severity up 24.2% over that same period.<sup>3</sup>

At the same time, the premium increases that carriers have implemented in response to the inflation, supply chain and extreme weather pressures have raised concerns about the heightened shopping and switching rates of consumers during policy renewal periods.

A survey from Trusted Choice® reveals the magnitude of the impacts that higher prices have had on consumer behavior. A few notable findings highlight that nearly 70% of Americans have started reviewing their insurance policies due to these price increases, with many considering higher deductibles as an option for cost savings. Approximately 22% of consumers have considered going uninsured as a means to economize in light of these cost pressures, with a significant majority (83%) suggesting they would switch insurance providers if it meant lower premiums.

This shift toward cost-saving measures, including the consideration of going uninsured or opting for higher deductibles, underscores the financial pressures consumers are facing and their attempts to navigate these challenges. In light of this, carriers will have to factor these changing consumer behaviors into their pricing, product and marketing strategies.

#### **REGULATORY PRESSURES**

Insurers will also face increasing headwinds from ever-evolving regulations. In the U.S., insurers need to comply with regulations such as the California Consumer Privacy Act (CCPA) and the California Privacy Rights Act (CPRA). Similar legislation continues to make its way through a larger number of U.S. state legislatures, each with subtle differences, complicating insurers' responses. The E.U.'s General Data Protection Regulation (GDPR) similarly outlines various consumer data privacy rights.

In addition, as the insurance industry continues to integrate AI and machine learning into operations such as claims management and underwriting, regulatory bodies are paying close attention to balance the benefits with potential risks. For instance, the Colorado Division of Insurance (CDOI) introduced the Algorithm and Predictive Model Governance Regulation, effective Nov. 14, 2023. This regulation is a pioneering effort aimed at ensuring AI models and external consumer data and information sources (ECDIS) are used without resulting in unfairly discriminatory insurance practices against a protected class, with the initial implementation concerning race. Colorado's initiative is notable as it may set a precedent for similar regulations in other states and other insurance sectors beyond life insurance.

Outside the U.S., the European Union is actively working on the AI Act, proposing a uniform legal framework for AI development and use across all sectors, including insurance. This act aims to ensure that AI applications, particularly those deemed highrisk, adhere to EU values and standards. The insurance industry, being highly regulated, faces unique challenges in integrating these cross-sectoral regulations.

Preparing for these new regulations will cause insurers to implement controlling mechanisms and new business processes that will ultimately increase their general and administrative expenses.

## USING A MODERN DATA AND ANALYTICS PLATFORM TO GAIN "INSIGHT ADVANTAGE"

This unprecedented set of market conditions requires insurers to react with informed speed. Firms that can react most quickly will have critical advantages over their competitors.

A significant component of an insurer's ability to meet these challenges is leveraging a modern data cloud platform designed to meet the evolving analytical needs of an organization and create a competitive "insight advantage." Insight advantage should be used to inform strategic considerations of the enterprise, evaluate opportunities for market expansion, drive increases in top-line growth, improve cost competitiveness, and positively impact customer experience.

Legacy data platforms — frequently built on premises — are hindered in many ways from delivering on the promise of their original business cases, let alone the expanded appetite for additional analytics-driven use cases. As insurance organizations look to solve "the data problem," they should consider the following characteristics of a modern SaaS data and analytics platform designed to support insight advantage.

### PRACTICAL USE CASES FOR A MODERN DATA PLATFORM

### Digital transformation and 360-degree views of consumers and businesses

Insurance carriers have pursued digital transformation initiatives for several compelling reasons, aiming to adapt to the rapidly evolving industry landscape and meet changing customer expectations.

Modern consumers expect fast, convenient and personalized interactions. Thanks to digital transformation initiatives, carriers can meet these expectations via online portals, mobile apps and Al-driven customer service, improving accessibility, responsiveness and personalization. At the same time, digital tools and processes help carriers streamline operations, reducing manual tasks and automating workflows. This leads to cost savings, faster response times, and improved accuracy in underwriting, claims processing and customer service.

Another notable benefit to digital transformation initiatives: Carriers can become more agile and responsive, quickly adapting their strategies and offerings based on industry changes.

One of the underpinnings of digital transformation in insurance involves achieving a 360-degree view of customers or commercial businesses, as digital transformation has facilitated the integration of many disparate data sources, including policy administration, billing and claims management systems, CRM platforms, social media, IoT devices and third-party data services.

Given the vast availability of third-party data, a first-party representation of a customer can be augmented by a broad set of demographic data (in the case of individuals) or firmographic data (in the case of commercial businesses). This broad view of a consumer or commercial business would be further supplemented by the integration of unstructured data, such as property aerial imagery or claim case notes.

This 360-degree view enables insights across numerous business processes, including risk selection, prospecting, underwriting, onboarding, servicing, claim triage, fraud detection, customer journey building and much more.

#### Curated data

For insurers to achieve the 360-degree view of their customers and agents and brokers, a modern data platform needs to go beyond providing unified raw data — the data needs to be curated. With curated data, data originating from policy administration, billing and claims management systems has been cleansed, flattened and mapped, and seamlessly integrated with external data sources. Having curated data saves insurers significant time and costs and allows teams to refocus resources on putting their data to work across the enterprise. Curated data is a foundational step in an insurer's journey to becoming more data driven, as it unlocks the ability for insurers to immediately begin making novel observations, make more data-driven decisions, as well as further operationalize the data by feeding it into AI/ML models and other systems.



#### **Enterprise data domains**

Many large insurers have created overlapping or competing data assets and pipelines to support the independent operations of business segments and functional areas within an organization. But this creates cost inefficiencies due to the necessary management of overlapping assets as well as the data versioning challenges associated with multiple and, oftentimes, competing data repositories.

This has led insurers to consider a domain-centric data architecture, where the accountability for creating enterprise domains is decentralized and given to a team of experts in a particular domain (e.g., account, customer, loss, location, etc.). Modern cloud data platforms that support the separation of compute and storage facilitate the creation of enterprise domains that can be built once but are consumed by any functional department or business unit for their specific needs.

Several insurers are adopting data mesh, a set of domain-oriented, decentralized data ownership and architecture principles as an approach to creating enterprise data domains.

#### Third-party data availability

A modern data platform provides access to numerous third-party data sets to a variety of users across the enterprise and can simplify the connection of first-party data to third-party data. This allows data science and analytics organizations to quickly evaluate new third-party data attributes to determine if they create "lift" to any of their models. This permits quick economic assessment of model lift versus the cost of a new third-party subscription license, which helps sustain insight advantage.

Insurers leveraging this kind of data ecosystem would need robust metadata for third-party data, describing characteristics of the data set to analytics consumers. That metadata should include certain characteristics, such as attributes, valid values and quality metrics, as well as unique attributes about the data set, such as usage rights restrictions, names of internal experts on the third-party data source, the business owner, and so on.

#### Data services and applications

With the growing collection of third-party data in cloud-based data marketplaces, interesting third-party data services will begin to emerge and should play an important role in a data ecosystem and in creating insight advantage.

For example, a Verisk study encompassing small commercial policy classifications over five years found that industry misclassification by SIC/NAICS code was 52%, leading to an estimated \$6.5B in premium leakage in the first year.<sup>4</sup> Misclassification is rampant in the industry for numerous reasons, including unreliable data sources, simple human error in data entry, and faulty information received from agents, brokers or property owners, all leading to the potential for significant premium leakage.

Given the enormity and variety of third-party data sources in data marketplaces, it would be easy to imagine a service designed to improve classification and reduce premium leakage or that could alert an insurer of changes in a business classification, altering the risk profile of the business or identifying a cross-sell opportunity.

Services such as fraud detection, litigation risk probability and identity resolution are examples of services that will become more prevalent with the growing availability of robust third-party data in data marketplaces.

As more of these services proliferate, organizations will be able to leverage them and their analytic models along with first- and third-party data, assembling them into analytical applications that are quick to build and deploy, furthering their information advantage.

#### Sharing data with ease

Enterprises should be able to share data across multiple segments and functions — both internally and externally — with ease, efficiency and security. This should not require resources to build and manage large amounts of data, nor should it require significant transformation, burdensome workloads, or scheduling and maintenance. And the process ought to be enabled without significant charges for accessing data or moving it between an insurer and its partners.

#### Business intelligence reports and analytics

Having a modern platform that provides a set of pre-built business intelligence and analytics reporting templates summarizing the data found within core systems can greatly accelerate an organization's level of data maturity and facilitate faster and smarter decision making. Examples of these reporting templates range from insurers being able to understand the performance of their agents and brokers, to viewing claim counts, claim cycle time and losses paid, to drilling down on billing summaries across lines of business and geographies. Enterprises can opt to utilize these reports as is, or business users can easily configure them as they see fit.

#### Ability to operationalize insights with gen AI

Successful organizations must be able to operationalize insights derived from their data ecosystems and embed those insights into business processes to help underwriters, claim handlers and others achieve better business outcomes and improve customer experience. An effective data ecosystem needs to simplify the process of injecting data and insights into the transactional systems at the point of interaction. And now that insurers can equip themselves with gen Al tools, their ability to leverage data to streamline operations, reduce cost and waste, and improve the customer experience is broader and potentially more impactful.



## Secure application of AI, MI and gen AI using corporate data

In a modern data platform, insurers must be able to securely apply AI, machine learning (ML), and gen AI using their integrated corporate and third-party data. This capability is crucial for leveraging the vast amounts of data they collect to gain insights, enhance decision-making, improve operational efficiencies and create more personalized customer experiences. That said, this must be accomplished with considerations for data security and privacy, data quality and governance, the ethical use of AI and bias mitigation, regulatory compliance, explainability and transparency — all of which will be reasonably challenging given the state of the ecosystem and pace of change in these fields.

### TECHNICAL CONSIDERATIONS FOR A MODERN DATA PLATFORM

A data platform can have a critical impact on the business, including time to market, risk levels and cost. Selecting a modern one — that meets your organization's needs and offers flexibility to implement AI effectively — is crucial in today's rapidly changing AI/ML landscape. That platform is most likely to be cloud-based, which allows for easier collaboration between internal and external stakeholders, as well as has the ability to ingest data from outside sources such as partners, agencies and third-party data vendors. Here are some important technical characteristics for chief data officers and IT leaders to consider.

#### Scalability

The data ecosystem needs to be scalable; it must meet exponential growth in demand for data and analytics across all business segments and functional areas of an enterprise. It must also support workload isolation to allow multiple workloads to be run concurrently without competing for the same set of limited machine resources. The architecture must be able to accommodate the processing demands of AI models and diverse data types.

#### Cost-effectiveness

The data ecosystem must also be cost-effective. In a cloud-based data platform that allows the separation of compute from storage, it is possible to run independent workloads against the same set of domain data. That provides complete cost transparency of each independent workload; an organization can evaluate the true net economic benefit of each analytic activity/workload within their organization. In an industry that is seeing exponential increases in demand for analytics, it is critical to evaluate the cost and value of each of these analytic activities to control costs and deliver ROI on analytic activities.

#### Data security and comprehensive governance

Many organizations are considering "data minimization" strategies at the behest of their legal and compliance functions to mitigate the risks brought on by rapidly evolving data privacy regulation that varies from state to state. Insurers will also have to walk a fine line between supporting this legislation and meeting the needs of their analytics communities in maximizing the amount of data they can acquire and utilize.

A contemporary data ecosystem should be able to support the broad and deep data needs of the analytics community — including Al use cases — while complying with evolving privacy legislation.

The platform, for example, must mitigate the risk of data exfiltration, ensuring that both sensitive information and queries remain within the secure confines of their environment. Furthermore, due to the risk of leaking sensitive enterprise data when working with gen Al training models, a modern data platform must also facilitate robust data governance protocols to maintain data integrity and comply with regulatory standards.

#### Optionality and flexibility

Organizations may evaluate gen Al base models such as OpenAl, Mistral and Llama on a number of factors, including quality, price and throughput. That said, base models are all undergoing frequent and remarkable improvements in each of these areas — and all of those factors can impact performance between models, complicating an organization's technical strategy for gen Al.

Furthermore, domain-oriented models could emerge to provide very high-quality gen Al capabilities within a given domain like underwriting or subrogation, but at a significantly lesser cost. Given the uncertainty of the landscape, it is critical that a modern data platform be able to support the flexible integration of various data sources and third-party tools, as well as provide optionality to interoperate with multiple base models and/or emerging domain-oriented models, depending on the use case.

#### Resiliency

Finally, modern data platforms must support a high level of business resiliency. Data ecosystems are leveraged beyond the traditional data warehouse, business intelligence and reporting workloads and become more integrated into critical business processes.

### HOW INSURANCE COMPANIES CAN BENEFIT FROM DATA AND AI

There is a growing recognition that insurers can introduce data, analytics and Al into virtually all of the important insurance functions and workflows, including product development, pricing and risk selection, underwriting, claims management, contact center optimization, distribution management, reinsurance, and understanding and shaping customer journeys.

Following are some of the exciting ways insurance companies can put data to work.



#### UNDERWRITING AND RISK SELECTION

For personal and small commercial lines, best-in-class insurers are connecting their first-party data — including IoT data, such as telematics and wearables — to a growing collection of third-party demographic and firmographic data to create a more comprehensive profile of a person or commercial business. These broad customer profiles are being used as inputs to machine learning models to better inform risk selection. Coupled with low-code configuration and automation, organizations are driving toward a more automated, standardized and objective underwriting process while improving pricing accuracy and loss ratios, cutting costs, and shortening quote-to-bind times.

In addition, these broad profiles can also be used as data prefill to streamline an organization's quote process, reducing the number of questions the agent or customer needs to respond to, and creating an exceptional customer experience.

#### RATING AND PRODUCT DEVELOPMENT

As insurers look to innovate faster and launch new products or bring existing products into new geographies, being able to ingest data more efficiently from core systems and beyond into their rating models is critical for capturing market opportunities before the competition does. With all the data at their fingertips, actuaries and data scientists are empowered to more rapidly model frequency, severity, loss cost, and enable insurance product managers to file new rates with regulators.

#### **CLAIMS ANALYTICS AND CLAIMS COPILOTS**

The claim function provides a fantastic set of use cases for the application of AI, ML and gen AI capabilities. By leveraging first- and third-party data, organizations can positively impact administrative and loss adjustment expenses, and overall take advantage of significant opportunities to improve efficiency, enhance customer satisfaction and reduce fraudulent activities.

There are several ways to surface claims analytics to claims adjusters, including the use of claims copilots. Leveraging an insurer's data and AI, copilots are interactive, virtual assistants that can help complete routine tasks. Copilots can provide claims summarization insights, as well as guidance and recommendations that can improve adjuster productivity, and free claims teams up to focus on providing empathy and support to customers when they need it most.

#### **10 EXAMPLES OF CLAIMS ANALYTICS OPPORTUNITIES**

Predictive modeling for claims frequency and severity	Forecast the likelihood and potential cost of future claims based on historical data, enabling better financial planning and reserve allocation, and ensuring that insurers are prepared for future payouts.
Claims triage and prioritization	Machine learning models can help automatically triage claims, allowing insurers to prioritize high-value or high-risk claims for faster processing, improving efficiency and customer satisfaction.
Claims outlier detection	Predictive models can attempt to identify less obvious high-cost claims early in the process, alerting claims professionals to the potential need to direct the claim to appropriately skilled resources. Such early intervention can help lower claim severity.
Fraud detection	Advanced analytics and machine learning models can detect unusual behaviors or inconsistencies in claims submissions, helping to flag and investigate suspicious claims before payouts are made.
Cost containment and leakage reduction	Analytics can identify areas where costs may be leaking due to unnecessary expenditures or inefficiencies in the claims process. Insurers can use this information to tighten their processes and reduce overall claims costs.
E Text and sentiment analysis	Gen AI capabilities can help analyze unstructured data from claim notes, customer emails and call transcripts to glean insights into claim complexity, customer sentiment and potential dissatisfaction or fraud.
Litigation risk detection models	If a claim is flagged as being more likely to result in litigation, insurers can focus on negotiation and settlement strategies more aggressively, prioritize where claims can benefit from more experienced adjusters or develop more informed allocations of claim resources.
Claims settlement optimization	By analyzing historical claims settlement data, insurers can identify optimal settlement strategies that balance cost efficiency with customer satisfaction. This can include identifying cases where early settlement might be beneficial or where alternative dispute resolution methods could be more effective.
Customer experience and satisfaction	Analytics can help insurers understand the claims process from the customer's perspective, identifying bottlenecks or pain points. Such insights can drive claims process improvements, enhancing overall customer experience and loyalty.
integration with external data	Integrating claims data with external sources — such as weather data for natural disaster claims or telematics data for auto insurance claims — can provide deeper insights into claim circumstances and validity, aiding in more accurate and fair assessments.

#### **CUSTOMER ANALYTICS**

As insurance shifts toward more digital-centric models, the role of data and analytics in understanding and engaging customers has become more crucial than ever.

With more touchpoints (websites, mobile apps, social media, etc.), there's a richer data pool to draw from for customer analytics. Coupled with raised customer expectations for personalized experiences, customer analytics is central to delivering a greater level of personalization by enabling businesses to understand and predict customer behavior and preferences. Common focus areas for customer analytics include:

#### Customer engagement strategies

The digital era has expanded the ways in which customers interact with businesses, from social media to chatbots and beyond. Analytics helps in understanding the effectiveness and customer satisfaction across these varied channels, allowing businesses to optimize their engagement strategies.

#### **Customer segmentation analytics**

Customized experiences often result in higher customer satisfaction and loyalty. By segmenting customers into distinct groups based on their behaviors, preferences and needs, insurers can tailor their services and communications more effectively.

#### Sentiment analysis

Gen Al capabilities are changing the way insurers can infer customer sentiment, helping gain insights into customer emotions and opinions from every touchpoint and channel. This insight allows insurers to gauge overall customer sentiment, identify areas of dissatisfaction, and make targeted improvements to enhance the customer experience.

#### Journey analytics

This involves tracking and analyzing every touchpoint a customer has with the insurer, from initial inquiry and policy purchase to claims and renewal. Insights from journey analytics help insurers identify bottlenecks or friction points in the customer journey, enabling them to optimize processes for a smoother, more satisfying customer experience.



## **SECRETS TO SUCCESS**

For insurance companies that want to stay competitive and meet the moment, managing internal data, leveraging external data, and developing advanced analytics are essential business practices but are not enough to build insight advantage.

Moving forward, insurance organizations must also:

- Know more about the insurance industry marketplace than their competitors
- Know more about their customers (consumers or commercial businesses) and agents and brokers than their competitors
- Be able to share and leverage information across internal and external organizational boundaries with simplicity and ease
- Manage volatile analytics workloads under increasing demand from all segments of their business
- Respond quickly to evolving and restrictive privacy legislation
- Securely leverage gen Al capabilities with corporate data, without the risk of IP/data exfiltration
- Integrate analytic insights into every point in the insurance decision-making lifecycle: pricing, risk selection, underwriting, claim interactions, and the full end-to-end customer experience

Insurance companies don't need to fly solo on all this, though. The right solution can help you build the necessary foundational data and analytics capabilities so you can confidently — and profitably — meet the future head-on.

To learn more about how Duck Creek and Snowflake can help, please visit www.duckcreek.com/product/clarity and www.snowflake.com/financial-services.

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#### **CITATIONS**

<sup>&</sup>lt;sup>2</sup> https://www.cmtelematics.com/news/cambridge-mobile-telematics-reports-distracted-driving-in-us-at-highest-point-of-pandemic

<sup>4</sup> https://www.verisk.com/insurance/visualize/the-race-to-zero-on-a-road-paved-with-quality-data/