Case Study: Insurance

Data Helps Define the World of Risk Insurance

A global reinsurer relies on data science to optimize coverages across its portfolio.

There are four classic ways to manage risk: assume it, lessen it, avoid it altogether, or transfer it. The last is the most difficult, since it entails accurately pricing what is essentially unknowable. But advances in data science can now inform risk analysis in a whole new way.

Cognizant was asked by a global reinsurance company to examine how data science can inform policy underwriting across a portfolio of insurance programs, leveraging the power of big data and predictive analytics to optimize portfolio risk and premium pricing.

At a glance

We helped a global reinsurance company to explore how data analytics could inform best practices across its business — including optimizing underwriting a broad portfolio of automobile insurance policies.

Outcomes

During a six-month research and development phase, our solution:.
- Improved underwriting efficiency.
- Reduced total underwriting time.
- Increased case acceptance percentage and revenue.

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Backstopping front-line risk

Reinsurers underwrite a predetermined share of losses for front-line insurers, providing the latter a backstop against potential loss. Just as insurers manage risk through a diversified portfolio of policies and coverages, reinsurers balance their appetite for returns by evaluating risk at the underwriting stage, to ensure they have adequate capital reserves and sufficient revenue streams from premiums to meet such needs.

We established an internal data science center of excellence that allows our client to examine underwriting processes across their ecosystem, developing use cases and demonstrating proofs-of-concept for applying data collection, analytics and predictive modeling to address the range of risks in their portfolio.

Making coverage personal

In underwriting automobile insurance policies, insurers rely on actuarial data and segmentation by age, gender, income, type of coverages, whether policyholders are homeowners and other factors. Such risk models aggregate data over time, then set a price on risks on a relatively large population based on data trends. Data on individual incidents is not recorded quickly enough to affect coverages; collective actions are not taken when there is a first notice of loss.

Like other insurers, our client was relying on a generic model to examine risks in underwriting automobile insurance policies. Our data science team developed a pilot system to use big-data analytics in real-time, cross-referenced to geospatial data, to drive deeper understanding of risk down to the individual customer. The objective was to learn what types of losses were occurring, with what frequency and severity, in which locations, to identify where and why losses were so high.

During a six-month research and development phase, we combined geospatial information with demographic and social data and data on the incidence of accidents, to understand where losses differed in certain areas. This was augmented with the reinsurer's own internal data and resulted in a risk score for individual drivers that could be inserted back into the under-writing model.

Our solution provided a holistic, end-to-end view of insureds at the individual level, resulting in a probability signaling the likelihood of a customer's risk of being involved in an accident. This provided our client a more detailed and reliable picture of the individuals whose automobile policies they were reinsuring, including behavioral and environmental factors. This allowed the company to model premiums for different and more nuanced profiles of risk.

Data in the driver's seat

During the project, our team at the data sciences center of excellence grew to include more than a dozen resources from our Artificial Intelligence Practice. Our solution depended on "R" and RShiny for exploratory data analysis and model-building; we used Python and deep learning packages like Keras and Theano to improve the model's predictive power, which comprised sophisticated data modeling and analytics, including distribution models, Bayesian analyses and advanced machine learning.

Our deep learning model resulted in a more efficient, more accurate, cost-effective model for understanding policy underwriting risk across a portfolio of more than a million policies. Our work with this client continues on a range of topics for other business processes.

For more information, visit www.cognizant.com/ai.

About Cognizant Insurance

Cognizant's Insurance Practice is one of the largest industry verticals that partners with insurers to evolve their business and technology landscape and enable end–to–end digital transformation. Thirty–three of the top 50 U.S. insurers and seven of the top 10 global insurers rely on us to help manage their technology portfolio across multiple business entities and geographies. We serve the entire range of lines of business within life, annuities, and property and casualty insurance. Our consulting–led approach, deep domain expertise and partner ecosystem enable clients to address the dual mandate of "optimizing the business" while "driving digital at scale." From large–scale core system transformation to adoption of cutting–edge technologies like artificial intelligence, analytics, blockchain, automation and machine learning,we partner with insurers to envision and build the digital insurer of the future. Our partnership includes helping insurers build their own technology platform with the capabilities they need or providing one for them, incorporating digital solutions to achieve immediate results. Learn more at www.cognizant.com/insurance.

About Cognizant Artificial Intelligence Practice

As part of Cognizant Digital Business, Cognizant's Artificial Intelligence Practice provides advanced data collection and management expertise, as well as artificial intelligence and analytics capabilities that help clients create highly–personalized digital experiences, products and services at every touchpoint of the customer journey. Our AI solutions glean insights from data to inform decision–making, improve operations efficiencies and reduce costs. We apply Evolutionary AI, Conversational AI and decision support solutions built on machine learning, deep learning and advanced analytics techniques to help our clients optimize their business/IT strategy, identify new growth areas and outperform the competition. To learn more, visit us at www.cognizant.com/ai.

About Cognizant

Cognizant (Nasdaq-100: CTSH) is one of the world's leading professional services companies, transforming clients' business, operating and technology models for the digital era. Our unique industry–based, consultative approach helps clients envision, build and run more innovative and efficient business-es. Headquartered in the U.S., Cognizant is ranked 195 on the Fortune 500 and is consistently listed among the most admired companies in the world. Learn how Cognizant helps clients lead with digital at www.cognizant.com or follow us @Cognizant.

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