

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.

Eighteen months ago, Cognizant Digital Business 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.

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.

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.

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 underwriting 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 & Analytics 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.

ABOUT COGNIZANT

Cognizant (Nasdaq-100: CTSI) 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 businesses. 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](https://twitter.com/Cognizant).



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