Cognizant

Case Study: Insurance

# AI machine learning drives underwriting efficiency by 10x

## A global reinsurer relies on machine learning and data science to analyze risk for flood insurance.

In the insurance business, assessing risk is not an exact science. Underwriters must painstakingly review an entire portfolio to understand their exposure, draft endorsements and price coverage. Cognizant helped a global reinsurance company examine how to make underwriting more efficient and productive by reducing the time underwriters must spend on manual work and expanding the range of data that informs decision-making.

### At a glance

We built an AI-driven solution to perform predictive, data-based underwriting analysis for a reinsurer planning to enter the US flood insurance market. Our solution combines flood hazard maps, GIS data, and the frequency and cost of historical claims to model risks across a portfolio. The implementation enables the insurer to:

- Model a potential market with 83% accuracy
- Generate a 10-fold reduction in throughput time in underwriting
- Improve case acceptance by 25%

## The challenge

For decades, the US government has been the insurer of first recourse to homeowners at risk of floods. In 1968, Congress made flood insurance available to homebuyers and businesses for the first time. Five years later, it made purchasing such insurance mandatory for properties in a flood plain or other at-risk areas.

Private insurers and reinsurers together can provide a valuable source of funds for recovery after catastrophic events, especially in areas affected by a massive storm. In 2016, the government decided to make its database of historical information on the nation's flood plains publicly available for the first time with the goal of encouraging insurance companies to underwrite some flood risk.

Providing flood insurance represents a significant opportunity for insurers; however, as with writing any policy, there are acceptable parameters for framing risk that must be balanced by accurate pricing. Our client wanted to examine the risk of reinsuring specific tranches of risk for its insurance clients and write individual policies for homeowners and businesses.

## The approach

To get a clearer view of flood risks and the ability to model risk factors by geography down to individual ZIP or ZIP+4 codes, our client sought to understand the size and scope of the US flood insurance market. Turning to Cognizant, we helped the reinsurer develop an intelligent algorithmic process to aid the underwriting process and boost efficiency.

### Detailed data analysis

We analyzed flood hazard maps developed by the National Flood Insurance Program, publicly available census data and housing information. Our solution overlays the geospatial data with data from geographic information systems (GISs) and our client's internal data on historical claims. Parameters included changes in population and the number of homes in areas, along with historical changes to designated flood zones.

Our AI and Analytics team used "R" software with ArcGIS for geospatial data extraction. We used one US state for our proof of concept, and then scaled the model to all 50 states and Puerto Rico. We conducted Bayesian distribution analysis to identify potential attributes that affect market opportunity and risks for areas down to individual ZIP+4 codes. We then depicted these risks using a dashboard with visualizations built on the RShiny platform.

## Business outcomes

Now, using natural language processing to automatically examine digitized documents and combine that information with geospatial data on flooding, our client can more accurately assess the frequency and severity of flood risk by geography. Our AI-driven machine learning solution leverages subject matter expertise with data science to make predictive underwriting faster, more efficient and more accurate—a competitive advantage for our client.

### AI delivers intelligent underwriting

Our client can now understand who has coverage and where, and model the factors that could drive the market, including behavioral patterns. This allows granular analysis of risk by policy by assigning risk scores to individual homes or businesses.

Benefits of the new solution include the ability to:

- Model a potential market with 83% accuracy
- Generate a 10-fold reduction in throughput time in underwriting
- Improve case acceptance by 25%

Since 2016, we have developed numerous other use cases for this client, including models for reviewing health and medical records to evaluate risk in a portfolio of policies for life and health insurers, and examining risks in the automobile insurance marketplace.

## 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 businesses. Headquartered in the U.S., Cognizant is ranked 185 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.


Cognizant

**World Headquarters**
300 Frank W. Burr Blvd.
Suite 36, 6th Floor
Teaneck, NJ 07666 USA
Phone: +1 201 801 0233
Fax: +1 201 801 0243
Toll Free: +1 888 937 3277

**European Headquarters**
1 Kingdom Street
Paddington Central
London W2 6BD England
Phone: +44 (0) 20 7297 7600
Fax: +44 (0) 20 7121 0102

**India Operations Headquarters**
#5/535 Old Mahabalipuram Road
Okkiyam Pettai, Thoraipakkam
Chennai, 600 096 India
Phone: +91 (0) 44 4209 6000
Fax: +91 (0) 44 4209 6060

**APAC Headquarters**
1 Changi Business Park Crescent
Plaza 8@CBP # 07-04/05/06
Tower A, Singapore 486025
Phone: + 65 6812 4051
Fax: + 65 6324 4051





Codex 3640