



Big Data in Insurance

The insurance industry is no stranger to data, advanced math, and statistical models. In fact, insurance pioneered a more rigorous, mathematical approach to its business when it first employed number-crunching actuaries to mitigate risk over a hundred years ago. The actuary's mission is to gather and analyze data in relation to a particular type of insurance and then make predictions about a particular risk, making them forerunners in what would later be called Data Science.

The Rise of Big Data

Recent advances in computing power have enabled data collection on a previously unimaginable scale, and we can now gather and analyze a higher quantity and variety of data than ever before. As we've entered the Internet age and witnessed the rise of social media, we've seen massive increases in data volume coming from a multiplicity of sources. And this data is now both structured (easily

stored in a database) and unstructured (highly challenging to analyze), with the most dramatic growth coming in unstructured data.

Today, analysis can be performed on more data, more types of data, and through faster acquisition of data. Even better, Big Data solutions can perform enormously sophisticated analysis at a pace actuaries were never able to, providing hugely valuable business insights which can increase revenues, cut costs, and significantly enhance profitability.

Let's look at some examples...

Personalized Premium Pricing

One of the benefits of Big Data is that it enables a truly customer-centric approach. It's now possible to examine many years of data for *all* of a company's customers, not just a sample, while considering all of the data held about a particular consumer's behavior and buying habits. In this way we can more accurately determine the ideal premium price on a per-customer, not per-demographic, basis. After all, the goal is for the pricing to be perfectly correlated with risk, and Big Data gets us very close to this.

Customer Churn

With the rise of online quoting and insurance aggregators, insurance is increasingly being viewed as a commodity, resulting in decreasing customer loyalty. Customer attrition, or “churn,” is one of the leading causes of lost profits in the industry.

The lifetime value of your customer is inversely related to the churn rate, so it's critical to take steps to minimize it. If, on average, you retain customers for ten years you have substantially more opportunities to make money than if you retain customers for four years because the cost of acquiring a new customer is dramatically higher than the cost of renewing an existing one.

In the good old days, renewals simply happened. Not anymore. Fortunately, you now have Big Data on your side, so that you can:

- Decide if you want to retain the customer in the first place. Some customers are simply not profitable.
- Act proactively to make better or earlier offers to avoid defection.
- Ascertain when you should be offering additional insurance due to a life event like marriage, the birth of a child, or graduation.
- Introduce customer loyalty programs like no-claims bonuses or new product discount to increase retention, while being able to decisively quantify the cost and effectiveness

- of such programs.
- Study interactions with lost customers, so we can identify the behaviors and customer attributes that serve as “early warning indicators” of attrition.

Combating Fraud

Fraud continues to be one of the biggest challenges for the insurance industry. It's estimated that perhaps 5%-10% of all claims are fraudulent, and the *Coalition Against Insurance Fraud* estimates the annual cost in excess of \$80 billion a year across all lines of insurance. These are dramatic numbers, and Big Data holds the promise of combating it.

Previously, fraud detection was a tiresome, time-consuming, and expensive manual process. Now we can use automated systems which look through claims data, customer data, and social media footprint to make a better assessment of a claim's validity. For example, is there a suspicious social network connection between the claimer and the third-party in the accident? Does this particular claim have a pattern similar to other, fraudulent claims? Imagine being able to analyze millions of claims at a time and identify those with high probability of being fraudulent, all while being more accurate and more cost-effective. It's within reach.

It's not just throwing more data at existing models that makes Big Data so exciting. There's also the possibility of incorporating new kinds of data to solve entirely new problems...

Welcome to the Internet of Things

In a nutshell, the Internet of Things is about using sensors to gather large amounts of data from things we previously didn't. One example from auto insurance is the increasing usage of vehicle-based telematics. By leveraging these systems, insurers can gather richer data about the customer's driving behavior and create a more detailed risk profile. There are multiple advantages to doing this:

- More accurate, individualized policy pricing based not just on claim history, but on the individual risk involved due to location and style of driving.
- Improved claims processing accuracy.
- Reduction in fraudulent claims by using data to verify customers' version of events.

In a similar way companies have the potential to analyze similar types of data coming from personal fitness devices, smartwatches and so on. One major insurance company has taken the step of giving away activity trackers to their customers; they could then gather and analyze the data to reward customers for reducing unhealthy habits or increasing their daily activity levels.

Analyzing new forms of data is creating a new field of more sophisticated, and highly-personalized, dynamic pricing and reward

strategies. Whether it's driving more carefully or walking more often, insurance firms now have the ability to reward good customer behavior and actively influence outcomes. It's a more personalized solution that encourages and motivates the consumer, and while it can reduce their cost of insurance it simultaneously makes them more profitable.

In all these areas, we're analyzing massive data sets to drive revenue and customer satisfaction outcomes. But Big Data can also help with critical legal issues...

An Approach to the Fiduciary Rule

While the main uses of Big Data have been oriented towards uncovering insights from disparate sources of data, the increase in oversight of insurance companies requires us to consider its potential in terms of compliance. This is particularly relevant with the recent approval of the Department of Labor Fiduciary Rule, which will come into effect in 2017.

As a result of this policy we anticipate a major change in the way companies market and sell insurance products, due to the required ability to demonstrate acting in the customer's best interests. Rather than walking a new client through the full gamut of products the company offers, or offering a new product to all clients, the company must now prove why they thought a particular product would benefit a particular customer. Having millions of policyholders and many different products

necessitates a Big Data approach in order to achieve consistency.

We advocate an approach that has been popular with retail clients for some time: classification and recommenders.

For example, if the data tell us that clients within a certain segment report very high levels of satisfaction with a particular insurance product, it gives us a strong justification for recommending that product to other clients with the same profile. When asked how this is in the consumer's interest, one may point to the high levels of satisfaction from other, similar customers. The beauty of such a data-driven approach is that it marries fiduciary responsibility with good marketing, as these clients would typically be more likely to respond to the offer in the first place.

Overall, it's an exciting time, with the promise and potential of Big Data even more dramatic than the advent of actuarial science over a hundred years ago.



Why Brilliant Data?

You can develop solutions in-house, but it's a steep learning curve. Here at Brilliant Data, we're recognized experts in leading Big Data technologies like Hadoop, Spark, and machine learning. We're committed to helping our clients not only deploy these advanced technologies, but understand them and be able to realize their full potential.

Brilliant Data has deep expertise gained from working in some of the world's most demanding IT environments. Our people have built sophisticated solutions that have helped our Fortune 500 clients and mid-market leaders alike, begin gathering and analyzing data in ways they had never dreamed of!

If you'd like to contact us to discuss your next project, drop us a line at info@brilliantdata.net

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