



Predictive Modeling—An Overview of Analytics in Claims Management

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Some experts say the use of predictive analytics has already become an industry best practice and will play an increasingly important role in the Property and Casualty business over the next decade.¹ While forms of predictive modeling have been used for actuarial and underwriting purposes for some time, technological advances over the past 5-10 years have improved its capabilities in these disciplines while also allowing for its expanded use into the claims management process.

A 2012 Towers Watson survey of Property and Casualty claim officers found that 63% of respondents have started to explore the use of predictive modeling in their claim operations. The survey further stated that 7% have already been using claim analytics for more than three years.² Reported uses of predictive modeling in conjunction with claims management include:

- > Allocation of Resources
- > Reserving/Settlement Values
- > Recognition of Potentially Fraudulent Claims
- > Identification of Potentially High Value Losses

> Expense Management

> Trend Analysis

The use of predictive modeling tools in claims is not meant to supplant the claim handler's own thought process. Its purpose is to provide decision support for his or her individual analysis. As with other forecasting tools, predictive models indicate probabilities, not certainties.

In this article we will examine the claim applications and factors to which carriers should give thought when considering the use of predictive modeling in claim administration. Claim professionals should always be aware of, and open to learning

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Created for our clients, our *Insurance Issues* publication provides an in-depth look at timely and important topics on insurance industry issues.

about, new and innovative claim handling tools. While certain tools are not for everyone, if there is an application that may potentially increase efficiency while having a positive impact on loss costs and expense, it behooves the claim professional to learn more about it.

Use in Claims Management

Using past events to anticipate the future, predictive modeling is a process whereby statistical and analytical techniques identify patterns that are then used to develop models that predict the likelihood of future events or behaviors. Working with a large

database, “data mining” software is used to analyze the data to uncover trends or relationships. Recent developments in machine learning, including the use of advanced technologies, have made strides in the ability to uncover correlations among factors in data. Ultimately, the association between certain factors helps insurers find ways to better match their time and talent to claim tasks.



Based on the predictive modeling process, it is not too hard to see how such an extensive review of historical data can provide insight on trends. But how can this information help in the management of claims on an ongoing basis? Proponents of predictive modeling assert it can be used in all aspects of the claim management process and across all lines of business.

Predictive modeling compares factors associated with new and pending claims against those of past losses. These components can include nature of injury, treatment, characteristics of the claimant (including age, domestic environment, etc.), insured data, liability, attorneys involved and venue, among others. Analysis of ultimate values of past claims fitting similar fact patterns can provide insight in formulating reserve and settlement values for current losses.

Utilizing the same data analysis, predictive modeling can be used to identify claims with the potential for high defense costs while also identifying which defense firms were associated with favorable outcomes involving similar type cases. Advocates of using analytics in this manner see an added value to the

litigation management process regarding defense counsel selection in which the most appropriate resources are assigned, thereby hopefully producing a positive effect on loss and expense costs. This methodology is also used for ranking claims with regard to subrogation potential, so that the claim professional can take a second look at losses that may not have been initially identified for possible recoveries and to either rule out or take appropriate action before it is too late.

What may be the most popular use for predictive modeling in claim management at this time, and typically a claim department's initial foray into analytics, is the identification of potentially fraudulent claims. The claim professional is familiar with the traditional “red flags” of potential fraud; however, he or she cannot be aware of all the possible similarities that an ongoing claim may have with past claims that were confirmed to be fraudulent. Based on such similarities and other fraud indicators, predictive modeling identifies claims for further investigation by the adjuster or a Special Investigation Unit (SIU). Matters that are cited in this manner do not necessarily mean that fraudulent activity is present, just that further review is warranted.

Managing Outlier Claims

All of the aforementioned benefits, which analytics may provide, can be seen as enhancements to the claim management process. However, one of the more interesting uses of predictive modeling is its reported ability to provide early warning of potential “outliers”: claims that appear routine but eventually develop into high value losses. While such claims exist in every line of business, we will use workers’ compensation as an example.

When a catastrophic claim is reported, such as a work-related loss involving a brain injury, amputation or paraplegia, claim professionals have a strong sense of the extensive treatment that will be required along with the potential for long-term disability and permanency. As such, they reserve the claim accordingly and assign appropriate medical management resources. These Cat claims are recognized and receive immediate attention. In contrast, claim professionals often have more difficulty in assessing loss values associated with claims that are commonly referred to as “creeping Cats.”



These losses typically involve minor soft tissue injuries, which are reserved and handled as such. Initially, these soft tissue claims are viewed as routine. Over time, however, they develop negatively. For example, return-to-work dates get pushed back, stronger pain medication is prescribed, and surgery may take place down the road. Losses initially reserved at \$8,000–\$10,000 then become claims costing \$200,000–\$300,000 or more. Since these claims may develop over an extended time period, they can be difficult to identify.

As discussed, predictive models review historical claim data for similarities and other factors shared by such losses, thereby alerting the claims professional to current claims that may have creeping Cat potential. With this information, strategies and resources can be applied at a point in time where they can be most effective in an effort to achieve the best possible outcome and control cost escalation.

Having access to similar information in other lines of business can be useful to the claim professional in reserving, selecting claim handling tactics and making informed choices in defense counsel assignment and expert witnesses.³

“With respect to claim applications, personal lines carriers are more likely to use modeling to detect fraud, while commercial lines carriers use it more to triage claims or to evaluate claims for litigation potential.”

— Towers Watson, *Insights—Predictive Modeling* (Jan. 2013)

Considerations

The main requirement for the predictive modeling process is data. Multi-year data is necessary to adjust

for economic cycles and other anomalies. The deeper the history, the better, although recent data is usually weighed more heavily for trending purposes.⁴

While most insurance carriers have a vast amount of data, modeling effectiveness is based on the data sources and the quality of the data provided. Claim records with missing, incomplete, or erroneous data have a negative impact on the accuracy of the predictive model. As such, efforts to ensure clean and accurate data must be undertaken. This process may be long and costly for some insurers and more so for those with multiple legacy systems.

Data integrity is essential. Any carrier with claim documentation issues must clean up and improve its practices before it is ready to consider analytics. Additionally, a predictive modeling service provider may be engaged to help determine the adequacy of a company’s data. If an insurer is in the process of converting to a new claim system, or is considering doing so, it may be best to postpone any implementation of modeling software until the conversion process is complete and the claim data is tested.

Does the use of analytics in claims really work? A number of large national carriers and corporate risk management departments report success using predictive modeling in their claims management process for several years.⁵ Of course, these organizations have deep data history and significant claim volume. Insurers with low claim volume may need to research further the cost effectiveness of utilizing modeling for their operation.

Some publications and vendors appear to promote predictive modeling as a way to automate decisions and allow a claim department to do more with less people. However, the principal goal of carriers using this technology is better allocation of time and talent of claim professionals. Its purpose is to assist the claim professional through the course of a claim and provide supplemental information to be used in the decision-making process.

While predictive modeling may enhance good claim handling, it cannot rectify poor claim handling. It is not a substitute for proper claim management methods and does not take the place of individual claim handling analysis.

Final Thoughts

The utilization of predictive modeling with claims management has been embraced by some carriers, explored by others, but remains unknown to many. Analytics can be an effective tool for certain claim departments, if used appropriately. It is up to the individual insurer to determine whether its claim department would benefit from utilizing predictive modeling in some manner and to assess implementation requirements of time, money and manpower.

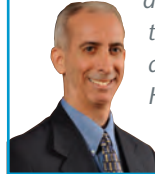
It remains to be seen whether the use of analytics in claims management will eventually become standard operating procedure as some experts believe. Perhaps future technological advances will bring this belief closer to reality. However, if there is technology available today that is said to enhance efficiencies with the potential for improved loss costs, it may be worth a closer look. ■

Common Claim Uses of Predictive Modeling

- > Fraud Detection
- > Outlier Claims
- > Reserve and Settlement Values
- > Defense Strategy
- > Litigation Expense Management
- > Subrogation Potential

About the Author

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Endnotes

- 1 Insurance Networking News (11/5/2008), "Predictive Modeling's Role in P&C Industry."
- 2 Towers Watson (Sept. 2012), Insights, "Property & Casualty Claim Officer Survey."
- 3 Advisen Ltd. (December 2011).
- 4 Anil Joshi (2012), Analytics Plus.
- 5 Elisabeth Boone, roughnotes.com (December 2011), "Changing the Game in Workers Compensation."

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