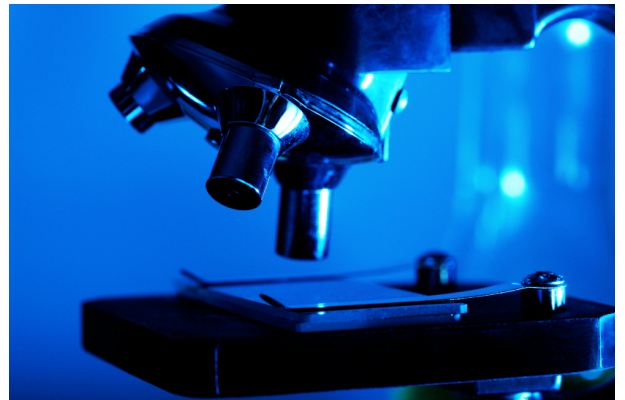


## Financial Foresight

A look at the latest topics affecting banking, insurance, investment management and securities

### Predictive Modeling Strategies:

#### *Applying Science to Claim Management*



Predictive modeling is a science that applies data mining techniques and algorithms to create mathematical formulas that can forecast and segment future events. In the context of insurance, rather than treat similar appearing customers as equal risks, predictive modeling enables organizations to identify specific customers with greater or lesser risk, and then assess them accordingly.

For several years, insurance companies have been improving underwriting results through the use of predictive modeling, and now this powerful technology is being applied to the world of claims. Through predictive modeling, companies are able to identify those claims that are likely to represent the greatest loss exposure. By pinpointing the high-value claim, and then applying leading claim practices, proven business rules, and experienced claim resources, insurance companies have been able to achieve meaningful improvements in claim outcomes.

While companies that implement predictive modeling typically achieve a reduction in claim costs of 3% to 5%, some attain savings of as much as 5% to 10%. This article describes how organizations can apply these techniques to drive down loss costs for disability, property, casualty, and other claims; improve adjuster

efficiency and productivity; and quickly apply the proper level of attention and care to those claimants who need it most.

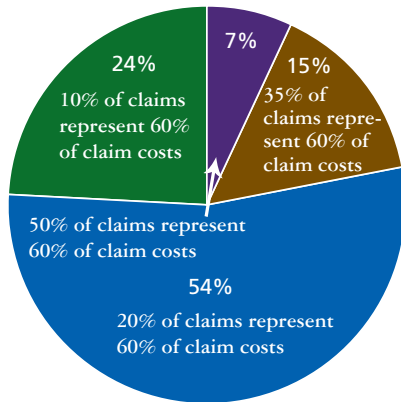
“The real challenge claim organizations face today is achieving the breakthrough that elevates them from the middle of the pack to leading edge,” says Mark Charron, a Principal with Deloitte Consulting LLP. “We believe that by effectively combining predictive models, business rules and talent management, organizations can truly achieve leading edge status.”

#### **Claim Processing: Art or Science?**

Successful claim management has long been a combination of art and science. The art relies on the instincts and experience that claim adjusters develop over the years, enabling them to successfully investigate, reserve, negotiate and resolve. But there is also an urgent need to apply more science to claim management, leveraging rich data that reveals important observations that are outside even the most seasoned adjuster’s line of sight. “In the demanding environment of scarce resources with heavy workloads, it becomes essential to apply the right resources to the right claim so that claim organizations can take the right actions at the right time,” says Steve Laudermilch, Senior Manager and Claim Practice Leader for Deloitte Consulting LLP.

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## What percentage of total claim costs do you believe is represented by high-cost claims?



Organizations that employ predictive modeling are able to identify the segments of their claim populations that account for a disproportionate share of loss costs. In a recent Deloitte poll, over half (54%) of the financial services and life sciences companies surveyed believed that 20% of claims represent 60% of claim costs. By segmenting claim populations with predictive models, organizations can swiftly deploy and focus resources, and take immediate action to fairly and effectively resolve challenging cases.

### Factors That Influence Claim Outcomes

There are two general groups of factors that influence the duration and cost of the claim: **medical** and **behavioral**.

**Medical** factors, such as obesity, diabetes and other co-morbidities, can prolong the duration or cost of claim. So, too, can misdiagnosis, improper or excessive treatment, and medical complexity.

At the same time, **behavioral** factors, such as a claimant's financial position, distance from work, or family responsibilities, can also influence the duration or cost of a claim. For example, one injured worker may encounter social pressures to "beat the system" whereas another may, conversely, be influenced by peers to work through a painful injury. An individual's orientation to medical treatment and even a sense of entitlement may also affect claim outcomes.

Typically, more traditional medical factors are used to evaluate claim exposure. According to a recent Deloitte poll, 55% of the financial services and life sciences companies surveyed use medical complexity as the primary criteria to identify high-cost claims. The remaining companies relied on behavioral factors (23%), physician treatment patterns (20%) and co-morbidities (3%) as their primary factors.

### Unlocking the Value of Data

One way claim organizations are applying more science to their business is by combining data mining with predictive modeling. Data mining uses mathematical techniques to analyze large quantities of internal and external information to unlock previously unknown, but meaningful, business relationships. It lays the foundation for predictive modeling.

Internal data includes claim detail, insurance policies, employer records, and information from pharmacies and physicians. External data can come from a variety of sources, including government agencies, such as the Occupational Safety and Health Administration and Bureau of Labor Statistics, and extensive vendor data repositories.

Combined, data mining and predictive modeling help identify factors that influence the length and costs of claims. "Predictive modeling is all about prospective segmentation," says Frank Zizzamia, a Director with Deloitte Consulting's Advanced Quantitative Services Group. "The question is which claimant is going to be out 20 days versus which claimant is going to be out 200 days? Knowing this in advance offers the opportunity to help those claimants who need the most assistance to get better faster and return to work sooner."

### Creating Predictive Models

The process of predictive model development starts with 200 to 300 raw variables that are typically distilled to some 50 to 75 final variables that best describe the future estimation in the most effective manner. It's like having a pile of jigsaw puzzle pieces and selecting the 50 to 75 pieces that fit together and tell the best story about future claim outcomes.

All data elements undergo variable analysis, also called univariate analysis, which is a statistical technique that assesses the relevance of each data element to the claim outcome. For example, there may be a relevant correlation involving *distance to attorney* (how far did a claimant have to travel to "shop their case") or *change in primary physician* that may signal a higher-cost claim.

Once the final variables have been chosen, mathematical scores are created for all of the elements and combined into an algorithm that maximizes predictive quality. Scoring, however, is not a one-time event. As events occur during the course of the claim life cycle, such as a medical complication or a change in physician, the claim score is refined to reflect the potential change in exposure.

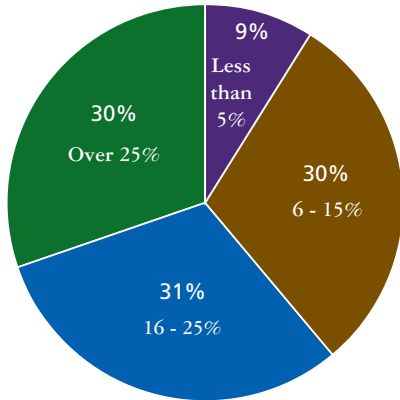
### Controlling Soft Fraud

There are many different definitions of insurance fraud. Criminal activities or staged events fall into the class of "hard" fraud and generate the most headlines. However, studies have shown that losses from soft fraud – the exaggeration or embellishment of claims and the subtle lagging of claim resolutions – can cost companies many times more loss dollars than from hard fraud.

A recent Deloitte poll indicates 70% of the financial services and life sciences companies believe that up to one-quarter of all claims involve a degree of soft fraud. The remaining 30% believe that soft fraud accounts for more than a quarter of all claim costs.

With the potential negative impact of soft-fraud on loss payouts, it is essential for insurance carriers to quickly identify those claims that have a high propensity to be inappropriately inflated. This crucial fight against soft-fraud begins with predictive modeling output and is advanced through business rules, which are system-generated actions or guidelines.

On average, what percentage of claim payments do you think are related to soft fraud?

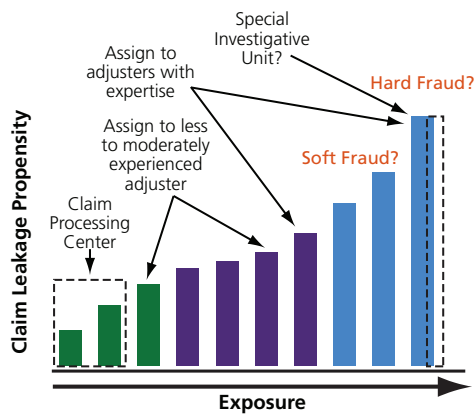


At claim intake, predictive models help identify suspicious claims, and business rules prompt claims to be quickly and optimally routed to claim adjusters with the appropriate level of experience. Established rules are also automatically triggered during the claim life cycle to promote proven practices and drive consistency in claim administration. Ultimately, losses can be controlled by using technology and tools to swiftly and decisively attack suspicious claims.

In addition to providing claim organizations with new weapons in the battle against soft fraud, predictive modeling is also yielding measurable reductions in the cost of claim processing. It has positively impacted adjusting staff, enhanced efficiency, and maximized the value of ancillary claim services. Finally, predictive modeling also provides guidance for adjusters as they evaluate and reserve claims that appear homogenous on the surface, yet represent a remarkably wide distribution in actual claim outcomes.

### Right Resource - Right Claim

Timely Identification of claim risk characteristics allows for the proper resources to be assigned at the outset of the claim.



Almost a decade ago, predictive modeling changed the face of insurance underwriting, providing first movers with a significant competitive advantage that, in some ways, redefined the industry landscape. It is clear that the organizations that become early adopters of this technological innovation in the claim arena will set a new standard for claim management and, ultimately, customer satisfaction and retention, and generate remarkable value in the marketplace.

## Questions and Answers About Predictive Modeling

### Does predictive modeling also apply to self-insured organizations?

Yes. The application of the predictive modeling techniques and tools is particularly appropriate for self-insured organizations because there is such a close relationship between claimants and their employers. In some case, the tools work even better because employers have enriched sources of data about claimants. There also is quite a bit of interest in the industry right now from self-insured organizations interested in applying predictive modeling techniques and tools.

### Is there an off-the-shelf system for predictive modeling?

Right now, there does not appear to be an off-the-shelf product for predictive modeling. All of the predictive modeling systems Deloitte has developed have been custom solutions tailored to clients' unique requirements.

### How subjective or scientific is the formula that takes the 50 to 75 variables and develops a claim score?

Predictive models are the product of deep data analysis with science, not subjectivity, driving the development. Technical statistical methods designed and performed by actuaries determine the optimal set of claim risk characteristics, or claim factors, that make up the predictive model and the correct weighting to be assigned to each variable. Ultimately, this quantitative process results in objective output produced by a mathematical formula.

Overall, the benefits derived from the predictive model output are a function of the claim management process, and the effectiveness in converting valuable insight into results. So, at the end of the day, there is a blending of both science and art that results in improved claim outcomes, helps injured workers return to work, and improves profitability of insurers and self insurers.

### Can an employer use predictive modeling at the group level, such as all insured covered under a disability policy, to forecast future claims?

This is a very common question, and there is a technique that is well developed. Quite simply, you can score all claimants in a book of business – within an employer group, within a disability plan – and you can roll it up to a higher level, such as up to an employer level. This yields an assessment of how a group of claimants looks at a given point in time. You also can track claims at the employer level over time to determine if the average or overall score is improving or worsening.

### Do insurance carriers or independent claim administrators use one predictive modeling tool more than the other?

There are levels of interest in and actual use of predictive modeling from both insurance carriers and third-party administrators (TPAs). On the carrier side, there is a huge opportunity to drive down loss costs and improve efficiencies. On the independent claim administrator side, there is a bit of a different value proposition. It

is usually the self-insured organizations' money, and they may be applying pressure to TPAs to use this technology. It is more of an efficiency play, as they try to shorten the life cycle of claims that they are getting paid to administer on a per-claim basis.

### Can you set the reserve based on a claim score?

Yes, you can use the claimant-level score as an indication of the adequacy of the case reserve. Typically, actuaries use a "top-down" approach to calculate the appropriate reserve in an aggregate manner, but Deloitte Consulting has developed an alternative methodology for determining both the case reserve as well as the total book reserve from the "bottom up," using data mining methods within a predictive model to generate claimant level indications.

### Can predictive modeling influence other aspects of an insurance operation?

Modeling can be utilized in a variety of insurance operations. When combined with underwriting and claim scoring, loss control

deployment can be extremely accurate. Rather than "inspecting all dry cleaners," for example, it is possible to examine risks by scores and use reason codes as the driver for improvement. In fact, if a particular risk is priced at a score of 7 or 8, it is possible for loss control to help lower the score to a 4 or 5. Loss control will be able to point to a quantitative improvement for lowering the risk score, and now can dramatically improve the profitability of the risk.

Another example of modeling applications is in the area of distribution management. By using scoring on an agency book, it is possible to market to accounts that have a higher propensity for a certain coverage at a certain time. In addition, many other metrics can be developed, such as agent commission based by score and agent productivity. For instance, a commission scale could correlate to desired policy scores, thus providing an incentive to agents to market to the correct type of accounts.

Finally, using similar techniques, but different data, modeling can be used for employee retention applications. It can help identify those employees who may be ready to leave or who could benefit from re-assignment or redeployment.

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