

Insurance



Executive Summary

While predictive modeling has proven itself to be an invaluable risk assessment tool in personal lines insurance, its adoption in commercial insurance has been relatively slow, even for small commercial. When an insurance carrier hesitates to integrate predictive modeling into the business, it's usually because of either a lack of resources or a lack of understanding about how to build an effective model.

However, there is another frequent barrier to adoption concern over organizational engagement in the desire to incorporate predictive modeling into business operations, especially when the ins and outs of predictive modeling remain a mystery to many in the commercial insurance sector.

But integrating predictive modeling into small commercial insurance is easier than many might think. Effectively applying predictive modeling can be likened to the four-stage product development lifecycle process of ideation, design and development, implementation, and monitoring.

Whether carriers choose to enlist the help of a solution provider or build a predictive model themselves from scratch, following a few best practices can make all the difference in achieving a successful outcome when using predictive models for risk assessment.

Applying Predictive Modeling Successfully

While predictive modeling has proven to be an invaluable risk assessment tool in personal lines, adoption within commercial lines is not as pervasive. Why? Often carriers lack the appropriate resources to build this capacity and/or they do not understand where to begin in applying a predictive model.

These limitations are not the only stumbling blocks. Because predictive modeling is still a bit of an enigma, many organizations are unsure about how to introduce and integrate such an initiative into their business operations.

Here is a common scenario. A vice president of commercial underwriting learns enough about predictive modeling to believe implementing such a model is critical to the business's success, but he or she struggles with questions like these:

- Will our executive leadership understand the basics of predictive modeling and support its use?
- Will the potential benefits justify the investment of company assets and resources?
- Do we have the necessary expertise to build a predictive model, and if not, what options exist?
- Do we have enough data to build a predictive model?
- What data sources should be considered for use in the model?
- How long will it take to design and build the model?
- What will our front line underwriters and, more importantly, our agents think?
- How will we know if our predictive modeling project is a success?

There is good news

Effectively applying predictive modeling is a structured process that any organization can follow. In fact, there are a number of techniques or best practices that can help carriers make the most of predictive modeling to improve their business outcomes.



Predictive Modeling and the Product Development Lifecycle Process

When it comes to implementing predictive modeling, carriers tend to find themselves in one of four situations:

- 1. Lacking expertise or data to build and incorporate their own models into the operations workflow.
- 2. Capable of building predictive models, but unable to incorporate them into the operations workflow.
- 3. Unable to build their own models but adept at implementing vendor or consultant-built models.
- 4. Sophisticated at building and implementing predictive models within their operations.

Carriers successful at leveraging the benefits of predictive modeling typically apply a product development lifecycle process to their predictive modeling efforts to ensure adoption and use. A product development lifecycle typically consists of the following stages: ideation, design and development, implementation, and monitoring.



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Ideation

Ideation involves identifying the problem that needs solving and determining whether or not predictive modeling can help solve it. Before starting the ideation phase, two conditions must be met:

- 1. Establish executive sponsorship
- 2. Establish a cross-functional team for the modeling project

Strong executive sponsorship is critical to success and can help guarantee the right resources and budget will be applied to the project.

A cross-functional team includes membership from all impacted functions (including sales, underwriting, product management, claims, IT, actuary and analytics) and works to engage the broad support and participation necessary to integrate predictive modeling into the workflow. Team responsibilities include:

- Identifying and validating the business problems to be solved
- · Generating ideas about how to solve these problems with predictive modeling
- · Selecting the best ideas to implement
- Showcasing the benefits of predictive modeling
- Pinpointing what costs will be incurred
- Determining if the costs of solving a problem with predictive modeling justify the expenditure or would be better applied elsewhere
- Exploring how the model will work in conjunction with business operations and what benchmarks and measures will be applied to assess the model's success
- Establishing buy-in

Design and Development

Many insurance carriers are building a number of different types of predictive models that are used for risk selection, pricing, claims fraud detection, claims subrogation potential, etc. For small commercial, there is a small, but growing, movement to use predictive modeling for risk assessment and pricing by building an "insurance score" to rank order risks in terms of loss propensity.

Design and development of an insurance score takes place across three highly iterative steps:

- 1. Data exploration
- 2. Model creation and validation
- 3. Regulatory review

Design and Development



Design and Development



Data exploration

During data exploration, different groups work together to evaluate which data sources to use and which sources correlate with the target. For small commercial risk assessment, insurance loss is typically the target. The working group responsible for data exploration usually includes business analysts, statistical modelers, IT resources and a member of the regulatory team—which is most often the carrier's product manager.

There are numerous third-party data sources to consider when building a model for small commercial risk assessment. Commercial credit is a very popular data source and is sourced from two commercial credit bureaus. For a micro business, business owner consumer credit is a commonly used data source that works well for predicting small commercial loss. Public records on either the business owner or business have recently become another popular source for assessing risk. Additionally, many carriers choose to integrate prior loss and/or geospatial data into their predictive models.

Model creation and validation

When building a predictive model, carriers need a large sample of data to train their model to predict the target and to test and validate that it works. The data must include the variable, "the target", that is being predicted. This sample data will be partitioned into two distinct sets:

- 1. Training data
- 2. Testing data

Training data – The training data is used to identify which variables correlate with the target being predicted and what weightings should be applied to those variables within the predictive model. While many variables may correlate with the target, steps should be taken to mitigate the use of these variables that correlate with each other—called multicollinearity. Predictor variables that correlate with each other can create unstable model weights, thus making it difficult to assess the effect of the variables on the target.

Testing data – The data for testing is used to simulate production and validate the model predicts the target or whether further refinement is necessary.

When building a model to assess small commercial risk, carriers typically use a large sample of both commercial policy premium and claims data. When organizations do not have sufficient data to build their own model, they will need to leverage a model developed by a vendor or consulting group.



The data must include the variable, "the target", that is being predicted.

To assess a score's efficacy for small commercial risk assessment, LexisNexis uses historical policy and loss data, scores the policies with data from the past, and leverages a gains chart to assess how well the score performs. The gains chart measures loss ratio against score deciles. As the score improves, the loss ratio should decrease—if the scoring system is working correctly.

We look for the following characteristics when assessing a score's benefit:

- Lift—What is the ratio between the best-performing group and the worst-performing group?
- Smooth segmentation—Is there a smooth trend as the score moves from the worst-performing group to the best-performing group? As the score improves, does the loss ratio associated with that group decrease?

Properly segmented insurance scores allow a carrier to establish groups in order to automate underwriting to decline, refer or accept business without underwriter intervention. These types of segmenting scores are also easily incorporated into rating or tiering algorithms.

Small Commercial Underwriting Requires Actionable Scores



Insurance Scores

The lift chart above demonstrates a score's efficacy in predicting loss ratio, as the score improves the loss ratio which is represented by the red bar decreases. In addition to the smooth segmentation, the score also demonstrates lift in the ratio between the best performing decile, decile 10, and the worst performing decile, decile 1.

Regulatory review

Carriers and solution suppliers must also consider the impact of the regulatory landscape on the data sources and attributes used in the models they create for small commercial risk assessment and pricing. When applying a predictive model for commercial insurance underwriting and pricing, most states require the model to be filed. Not all states will be in agreement about which data sources and attributes are permissible. Ideally, the same model will be used across all applicable states, but often state exception logic will be necessary to comply with state requirements.

Implementation Considerations

There are several key steps that allow for a successful implementation. While a number of organizations are extremely successful in developing a model that predicts their target, many others struggle when it comes to fully integrating the model into their operations and workflow. There are impacts to many parts of the organization and many decisions to be made.



Implementation Considerations – For small commercial risk assessment, carriers must decide how to incorporate the score into their pricing and underwriting. Will they use the score only to justify discretionary pricing or will they incorporate it into their rating or writing company selection? They must also identify and document how, if at all, underwriting rules and procedures will change.

IT Systems Integration – Once the rating and underwriting changes are determined, the implementation team will need to work closely with the IT team to build the production version of the score, incorporate the score into the application workflow, and store and track score usage. IT may have additional concerns over how much programming and testing will be required to integrate the score within the workflow and how the implementation will be rolled out to production. **Dispute process** – Depending upon the data sources used in the model, it's also important to ensure a dispute process from the applicant or insured can be supported. To assess small commercial risk, many carriers use "consumer reports" (as defined by the Fair Credit Reporting Act "FCRA") such as a consumer credit report. When using a data source subject to the FCRA, insurance carriers need to be prepared to provide adverse action notice when coverage is denied or priced in a more expensive rating tier.

Stakeholder training – All impacted parties, both internal and external, will need to be trained on the model and how it will be used, its benefits, and how success will be measured. Sales and Marketing must develop a communication plan to explain the score to their marketing representatives and agents. Lastly, organizations must decide how they will roll the score out across their operations. Will use of the score be phased or rolled out to production all at once?

For small commercial risk assessment, carriers must decide how to incorporate the score into their pricing and underwriting.

Monitoring

A model is only as good as its results. Tracking ongoing performance and making necessary changes are a vital part of ensuring a model works for the business. There are two basic components in monitoring for predictive modeling:

- 1. Tracking usage
- 2. Monitoring efficacy

Tracking usage – Scores should be tracked both when they are used and when they are overridden. When they are overridden, it is essential to know who overrode the score and why. Allowing for and documenting score overrides provides valuable insight into score limitations and how the score and its implementation should be improved in the future.

Monitoring efficacy – Carriers must also periodically monitor the overall efficacy of the model. Is it achieving the desired results? Do performance indicators meet expectations? If not, a deep dive into the underlying causes is required. Models may need to be recalibrated or rebuilt. Recalibration views the model as essentially working, but requires adjustments to individual variables to achieve the desired results. Rebuilding is creating a totally new model and revisiting all of the product phases from Ideation to Design and Development, and subsequent phases, to revisit past assumptions and consider new and/or additional data sources.

Management—Support
and MaintenanceImage: Manage<td

Conclusion

A well thought-out, deliberate plan that aligns with a product development lifecycle process is the key to a successful predictive modeling implementation—enabling commercial insurers to realize the full benefits of predictive modeling for small commercial risk assessment and pricing. Critical elements in this effort are executive sponsorship, a competent and engaged cross-functional project team, and a four stage life-cycle process of ideation, design and development, implementation, and monitoring to steer the process.

In our experience, carriers who've applied these best practices have truly transformed their businesses. We hope you will find these guidelines useful, and be able to leverage them in ways that help your business grow and prosper.



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Mathew Stordy is Director of Commercial Insurance for LexisNexis Risk Solutions. Stordy is responsible for requirements assessments and the design of data solutions and services that streamline commercial insurance processes and provide insights about entities through the use of data, analytics and software. Prior to joining LexisNexis, Stordy worked extensively with policy administration systems, quoting applications and business intelligence solutions. He holds a bachelor's degree in mathematics with a minor in computer science and a master's degree in philosophy from the University of Connecticut.

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About LexisNexis Risk Solutions

At LexisNexis Risk Solutions, we believe in the power of data and advanced analytics for better risk management. With over 40 years of expertise, we are the trusted data analytics provider for organizations seeking actionable insights to manage risks and improve results while upholding the highest standards for security and privacy. Headquartered in metro Atlanta, USA, LexisNexis Risk Solutions serves customers in more than 100 countries and is part of RELX Group plc, a global provider of information and analytics for professional and business customers across industries. For more information, please visit www.risk.lexisnexis.com.

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