



Guidewire Predictive Analytics: Automated Rate Adjustment

> Enhancing the Accuracy of Personal Lines Pricing to Grow Profitably and Avoid Adverse Selection

Creating a Smart Core System

Many insurers have invested in modern core systems that are flexible and robust to drive transformational change through their operations. Compared to prior legacy mainframe environments, the new systems enable employees to work more efficiently and enjoyably, bring focus to the customer relationship and improve the quality of individual interactions, and enforce process consistency and best practice. Such investments have positioned these insurers to pursue new markets and to leverage new technologies more rapidly.

Significant advancements made in predictive analytics for P&C insurance have now created a unique opportunity for insurers with modern core systems to embed analytic scores within the core decision-making workflow, thereby creating a “smart” core system. Successfully leveraging predictive analytics requires a few key ingredients:

- A business problem with a clearly defined target outcome
- A functional design to integrate analytic scores into the core system workflow
- A technical design that includes data acquisition, model building, and core system integration

However, becoming a data- and analytics-driven insurance company requires much more than data and predictive models. It requires a solution that business users can understand and leverage easily so they can make fact-based decisions. You can maximize your technology investment, speed up implementation, and achieve faster ROI by using the Automated Rate Adjustment solution described in this document—a solution that integrates **Guidewire ClaimCenter** with **Guidewire Predictive Analytics** and its award-winning machine-learning technology.

Business Problem

Insurance pricing in competitive markets is complex and difficult. Quoted premiums need to be competitive to win new customers, avoid adverse selection, and reduce customer churn. Rating plans for insurance products take months to produce—and can take years for losses to fully develop—while ineffective rating plans result in elevated loss ratios.

Fortunately, the impact of leveraging machine learning in insurance pricing has been well established. By integrating Guidewire Predictive Analytics and its machine-learning rating factors in the quote workflow, insurers can adjust—in real time—the coverage level and overall premiums calculated through an existing rating engine to more accurately price each customer. Producers and underwriters can thus provide an accurate, competitive, and profitable price without the need to wait for time-consuming updates to the underlying rating models. As a result, you can experience reduced loss ratios, higher profitability, and improved customer service.

Functional Design

Each time a price is requested from the PolicyCenter rating engine, the solution makes a call to Predictive Analytics to calculate a price adjustment factor for a given coverage. The standard Quote screen (Figure 1) already includes such adjustments in the premiums shown. Users can then communicate the quote or bind the submission as usual.

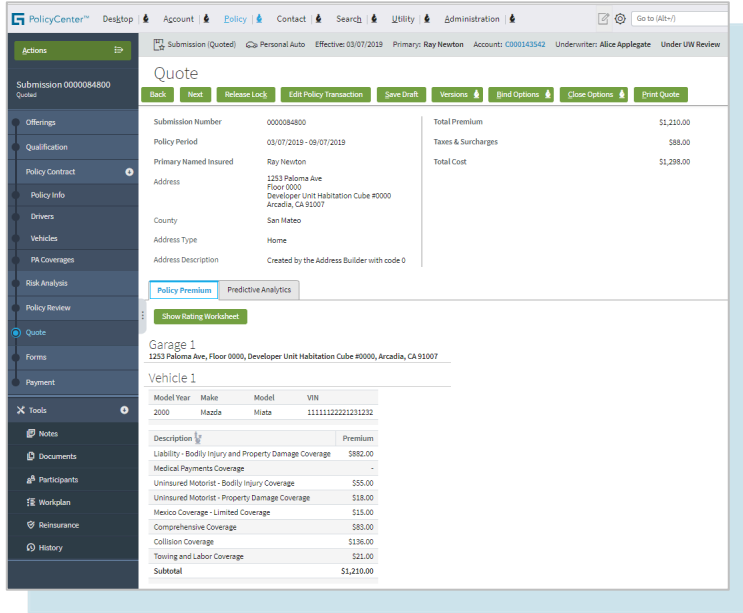


Figure 1: Standard Quote screen in Guidewire PolicyCenter showing the adjusted premiums for the policy coverages

Some users, such as underwriters, may want deeper insight into the adjusted coverage premiums. In the existing Rating Worksheet (Figure 2), users can view the Predictive Analytics adjustment factor for each coverage in the context of all the other premium modifiers applied to base rates.

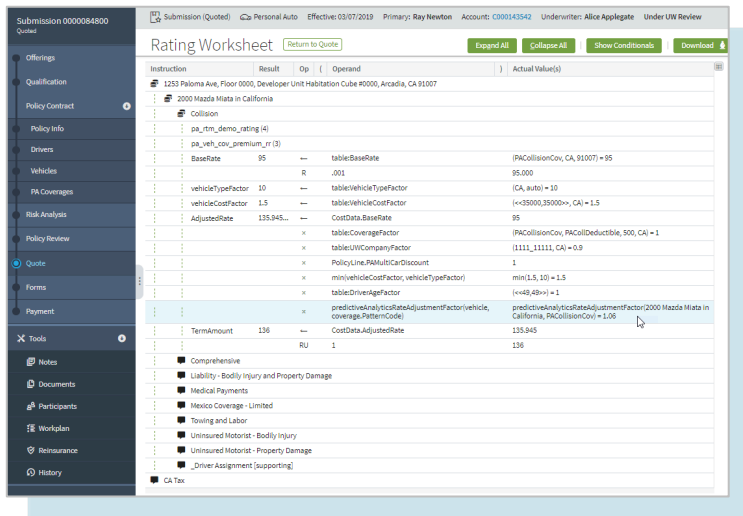


Figure 2: Rating Worksheet in Guidewire PolicyCenter showing adjustment factors for the policy coverages along with existing rate modifiers

In addition, a new Predictive Analytics screen (Figure 3) enables PolicyCenter users to view how each adjustment factor was derived by the predictive model. This screen shows how the model scores affect each vehicle and coverage combination. Scores are scaled between 1 and 999, with scores less than 500 expected to be less profitable than the median policy. Influencers that decrease the profitability score tend to increase the rate adjustment factor, although the correlation may not be linear.

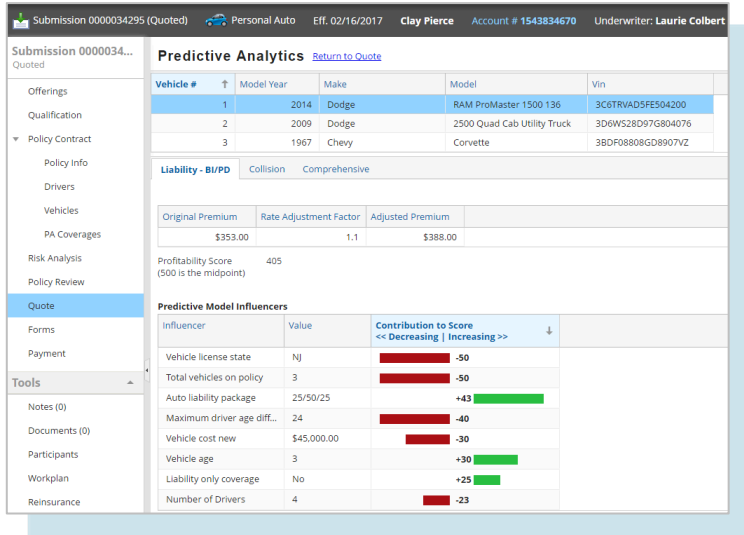


Figure 3: A new Predictive Analytics screen in Guidewire PolicyCenter showing the predictive model influencers for policy coverages

Other Functional Considerations

The Automated Rate Adjustment solution assumes that premiums are calculated at a per-coverage level of granularity (as is the standard in PolicyCenter) and that Guidewire Rating Management is used for rating. The solution can also be configured to apply policy-level price adjustments as well as integrate with third-party rating engines.

For business reasons, it may not be desirable to update the rate adjustment factors from Predictive Analytics for every mid-term transaction in PolicyCenter. Insurers can decide whether to update their rate adjustment factors for existing coverages when new coverages are added or other changes are made in the middle of a policy term.

In cases where the generated quote and the rate adjustment factor(s) have a large impact on the final premium, rules can be configured to trigger activities for manual underwriter review and approval (or rejection). Access to the new screens and adjustment factors can be controlled through PolicyCenter’s standard role permissions. Lastly, a new account overview screen has been added to view all the modeling results from all of the policies on the account.

Technical Design

The functional design described above leverages Guidewire PolicyCenter for core operational workflow and Guidewire Predictive Analytics to build and deploy rate adjustment models. The technical design must consider three key components: data acquisition and preparation, analysis and modeling, and core system integration.

Data Acquisition and Preparation

Guidewire then builds and refines customized predictive models using a full range of statistical and machine-learning rating factors. Insurers can leverage additional variables such as policy-level configurations and linking risk-level location data to third-party demographic and geospatial libraries. An ideal dataset should enable analysis and modeling at both coverage and

policy levels and typically consists of three to five years of premium and loss information. Premium on-leveling, loss development, trending, and other standard actuarial functions are performed as needed.

Analysis and Modelling

After data has been prepared, the insurer and Guidewire make selections regarding:

- **Training vs. Validation Criteria:** A transaction-level randomized split of 70% training-30% validation is a standard starting point. Year-over-year and multiple validation holdouts are also considered.
- **Model Granularity:** Policy-level, risk-level, or coverage-level modeling
- **Model Target:** Loss frequency/severity modeling vs. loss ratio residual modeling. The more recent and sophisticated the rating plan, the more likely it is to use loss ratio residual modeling.

The next step is the selection of the best variables (low correlations, high signal, and low noise) to build and refine a customized predictive model. Rating factors are created based on the principle that variables are interactive and not independent, and machine learning automates the search for all meaningful and credible interactions. This ensures the creation and testing of an accurate and powerful rating plan that is a reliable predictor of future performance. The solution then creates a series of models with differing algorithm parameters and credibility thresholds, with the winning models selected based on a combination of lift and stability.

In addition to calculating adjusted premiums, the Guidewire Predictive Analytics platform can measure customer sensitivity to premium changes, analyze customer rate impact, and forecast the long-term effect of rate changes. The right modeling decision depends on the insurer's competitive situation and current profitability. The best practice is not to take the fully actuarial indicated result all at once; instead, measured changes should be taken that minimize churn and gradually adjust rates over several years.

Integration with Guidewire PolicyCenter

To operationalize the model, Guidewire Predictive Analytics creates an API to score underwriting submissions. PolicyCenter then uses HTTPClient to call a REST service published in Amazon Web Services. Configuration tools define the scheduled times and/or triggering events that initiate these calls. Where necessary, UI screens are created or revised to display model results properly (see "Functional Design"). All processes are designed to safeguard PolicyCenter's performance.

Solution Delivery and Value Realization

Leveraging Guidewire Predictive Analytics, the Automated Rate Adjustment solution can be delivered in a relatively short time period with the following high-level delivery phases:

- Inception workshop (1–2 days)
- Data acquisition and preparation, followed by model building (1–2 months)
- Core system integration and implementation (1–2 months)

Guidewire can provide customers with consulting services to handle each of these phases, typically requiring only a few hundred hours of work. Customers can also use Guidewire software products independently and self-sufficiently, leverage one of our implementation partners, or use any combination of approaches.

In addition, customers have the option to leverage Guidewire Professional Services to help identify key performance indicators (KPIs) to measure the business benefit and validate ROI. Because predictive models can grow outdated as external business conditions and internal processes continue to change, Guidewire can also provide a complete lifecycle service that includes an annual model refresh to review and optimize model performance and then promptly deploy the revised model into production.

Guidewire is the platform P&C insurers trust to engage, innovate, and grow efficiently. We combine digital, core, analytics, and AI to deliver our platform as a cloud service. More than 380 insurers, from new ventures to the largest and most complex in the world, run on Guidewire. For more information, contact us at info@guidewire.com.



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