

# DECISION PLATFORMS AND RATINGS ENGINES IN SPECIALTY INSURANCE

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Using the InRule® Decision Platform for building and maintaining ratings engines for specialty insurance



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# DECISION PLATFORMS AND RATINGS ENGINES IN SPECIALTY INSURANCE

*This white paper highlights the unique requirements of building and maintaining a ratings engine to support specialty insurance, further focusing on how the InRule® Decision Platform answers those needs.*

## OVERVIEW OF THE SPECIALTY INSURANCE ARENA

Specialty Insurance is the branch of insurance that covers a wide variety of the risks that fall outside the more common property and casualty lines. Specialty policies cover everything from ships, race tracks, pollution standards, subcontractor performance, cybercrime and more.

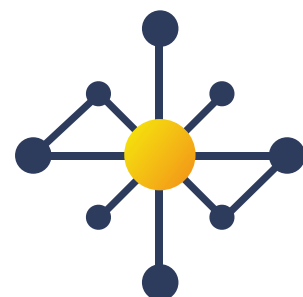
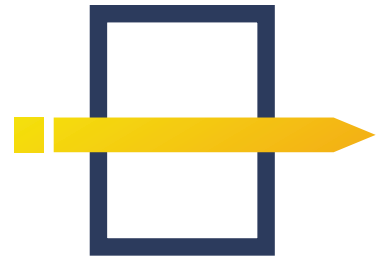
A ratings engine is the vehicle that allows insurance companies to assess the risk associated with a loss and assign a premium to it. A well-calibrated and regularly updated ratings engine is vital to a specialty insurance carrier's technology portfolio.

The wide variety of unique risks associated with Specialty Insurance makes implementing a ratings engine more challenging when compared to other types of insurance. Where traditional insurance relies on the relatively large and stable data coming from a large risk pool, the Specialty Insurer does not have that luxury. The number of cases available to provide an actuarial assessment is significantly fewer than traditional lines. For example, a far larger data set exists for automobile risk than for ships. Additionally, the sheer variety of insured risks is larger and more varied for Specialty Insurers than for traditional lines of insurance. A wider pool of more uncommon risk creates a more volatile environment for basing actuarial decisions.

As with traditional insurance, insurance of specialty lines is highly competitive in both price and product. Time pressure and agility are critical to a carrier's success as markets continue to emerge and evolve. For these and other reasons, specialty insurers must have a ratings engine that is flexible, scalable, and quickly adaptable to new and emerging markets.

### Platform Requirements

The ability of a Specialty Insurance business to respond to these challenges is reliant upon a ratings engine platform that minimizes development time. However, this platform also needs to support the ability to fine tune the ratings logic to account for situations that were not anticipated in the original production release.



To respond accurately to the business, the platform needs to make transparent all the decisions made by the ratings engine. Therefore, the ratings engine’s business decisions need to be separated from the operational logic. In traditional software code, ratings logic can be difficult to locate and challenging to modify quickly, which hampers the business’s ability to adapt.

Insurance carriers must also carefully consider who has access to the ratings engine and associated logic. Some organizations keep the logic centralized with an on-premises approach. Others make it accessible to qualified independent agents. In the former situation, the carrier maintains control of the ratings engine and all of the decisions around it. In the other scenario, the carrier trades centralization for increased marketing reach. A ratings engine in a web-based portal, available for qualified agents, makes it easier for the agents to review, quote and issue policies.

The ratings engine cannot itself be viewed as a stand-alone component in a Specialty Insurer’s technology suite. It needs to be well-integrated with the insurer’s systems environment, including the ability to interrogate key reference data and financial information that may impact the premium. The engine also likely needs to be integrated with operational areas such as billing.

For the Specialty Insurance carrier, a ratings engine needs to support the company’s ability to quickly bring to market a wide variety of products. Further, it needs to be nimble enough to permit the insertion of additional of products into existing software designs with the smallest possible impact to existing code.

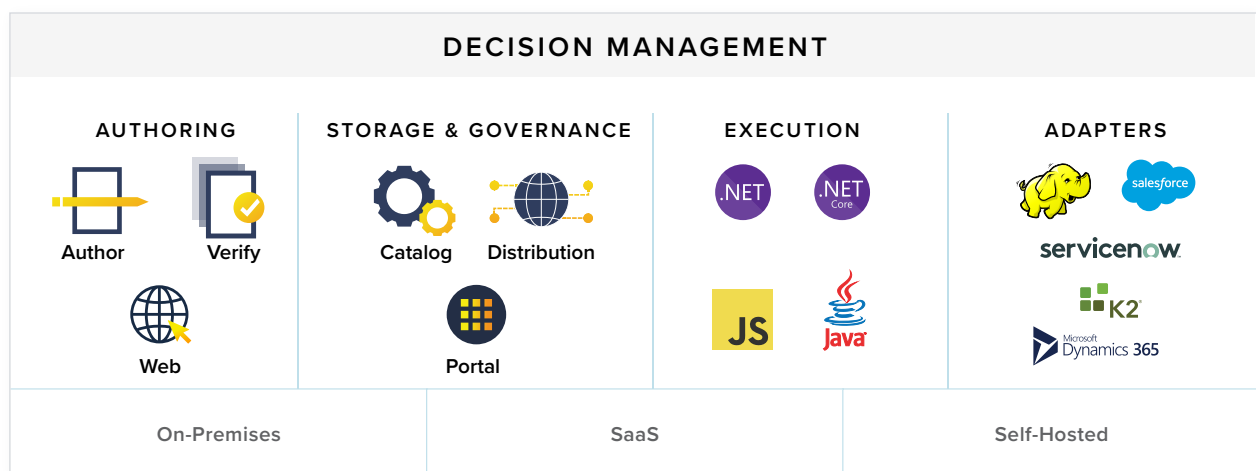
## A CASE FOR INRULE®

The InRule® Decision Platform matches up exceedingly well with these requirements. The remainder of this white paper examines how the architecture and features of InRule address the variety of needs of the Specialty Insurer. It also looks at how InRule supports the critical success factors for implementing a ratings engine.

A key element to any decision platform is the ability to capture and centralize enterprise decisions. This is represented in the diagram below by the **Authoring and Storage & Governance** boxes. In addition, with the increasing use of analytics, **artificial intelligence (AI)**, **machine learning (ML)**, and real-time data, a decision platform should also be able to create decisions that can adapt in near real time.

### Authoring: Writing and Executing Rules in Business-Friendly Language

In an area as complex as Specialty Insurance rating, the business is likely not comfortable with a “black box”



The figure above provides an overview of the current and planned architectural components of InRule

approach to decision-making. They will want to have a clear picture of what is happening during the rating process and why. In order to accomplish this, InRule provides a way to:

- **Capture decisions and rules in plain language using verbiage that is common to the business**
- **Let the business author adjust logic so that the meaning and desired outcome are not lost in translation between the business and IT**
- **Provide a peer review and versioning of rules**
- **Test results and performance quickly and efficiently**

Each of these capabilities is key for any decision platform under consideration for use as a rating engine. These capabilities affect not only the quality of the decisions but also the turnaround time for implementing rating changes or new product lines.

**If**

all of the following are true

**Hull Type** is equal to “**fiberglass**”

**Location** is equal to “**Marina**”

[add condition]

**Then**

add a **Discount** of 10%

add a **Ratings** message that says “**Marina discount of 10% applied because Hull Type**”

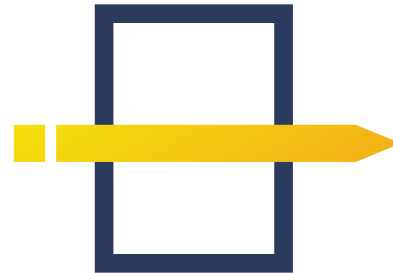
[add action]

InRule’s authoring tool, **irAuthor**<sup>®</sup>, allows developers or the business to write decisions in a clear, structured framework that is easily understandable to all.

The example above shows boat rating logic that specifies a discount based on hull type and location. Bold items reference elements of the rating engine’s data model, and this logic is easily readable by both business and development personnel.

This is a point worth emphasizing: the use of a common language for implementing rating and underwriting decision logic is critical to the success of a ratings engine. A common problem for organizations is that different groups often have different definitions of the same term. The term “premium” is a good example: does it refer to the amount that is charged for the policy before or

after discounts or expenses are applied? Or is that different in different logic contexts? Implementing a common vocabulary between the business and the integration is vital for the consistency of decisions.



InRule offers the advantage that non-developer subject matter experts can define (or help define) the terms used in authoring logic. Once a data model is in place, irAuthor provides templates and operators for making language consistent and rules easy to develop. And these rules do not have to be adapted to code. This solves the dual problems of:

- **Loss in translation from author to developer**
- **Loss of the original meaning of what the author meant by the rule**

irAuthor’s authoring interface can be learned quickly due to its similarity to commonly used Microsoft products. Very little additional training is needed to develop initial rules, allowing the author to focus on the task of organizing and writing logic rather than wrestling with the environment.

## Flexible Schema Development

Because each organization’s environment is different, the InRule Decision Platform allows every organization to define its unique objects and properties used in rules. These definitions can be created manually in irAuthor, or they can be imported from a CRM system, a database, an XSD, a JSON file, or a .NET assembly. This flexibility in options allows organizations to configure the authoring environment that best suits their specific needs without duplicating investments made elsewhere in the information technology infrastructure. It also allows the customization of the business language editor with vocabulary and rule templates that make the rule-writing experience specific to a given industry or organization.

## Testing

All logic must be tested, regardless of the chosen platform. InRule's **irVerify**® enables the author to test that rules are executing as expected and within performance requirements. With irVerify, rules can be tested seconds after they are written, providing users with the immediate feedback needed to understand whether a requirement has been implemented correctly. Supporting rapid, iterative development, irVerify works without the need for a completed application or separate test environment. This allows authors to:

- **Verify decisions and how they were made**
- **Customize or load relevant test data**
- **Return notifications with the runtime values of key fields or variables**
- **Customize notifications to return why a decision was reached**
- **Examine detailed rule traces to evaluate execution order and specific input or output values**

irVerify also permits regression and performance testing for power users and developers.



## Logic Reuse, Storage and Governance

The InRule Decision Platform contains functionality for logic reuse, storage, and governance that are critical to iterative and agile development. With InRule, Specialty Insurance carriers have the ability to isolate and parameterize branches of logic for easy reuse. InRule's flexible vocabulary templates also further permits creation of custom reusable, business-specific functions that speed up development of similar logic. Reuse of decision logic provides a significant competitive advantage in that key logic can be adapted for reuse more easily than with traditional software code.

InRule's storage capabilities permit the ability to share, restrict, and control how different teams access the rules. This functionality is housed in InRule's **irCatalog**®, a secure, auditable, and accessible repository for rule logic. Features of irCatalog include:

- **Support of different environments for development, testing, production, and more**
- **Easy promotion between environments**
- **Comprehensive version tracking and the option to roll back to an earlier version**
- **Accessing the most current rules during rule authoring and at execution time — without recompiling code**
- **Change reporting from one version of rules to another**
- **Allowing multiple users to work on different parts of the business rule base at the same time**
- **Sharing of common data structures, business rules and endpoints between rule applications**

irCatalog's features permit teams to collaborate together quickly and effectively while providing organizations the flexibility to customize governance procedures.

There is a considerable amount to be learned from analyzing what is happening when the decision platform is run in a production environment. The logic within a decision platform should not be regarded as "set in stone" and once created should not be changed. It should be considered a starting point that is transparent and can evolve as market conditions, regulations and business demands change.

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InRule’s reporting features are highly flexible, permitting users to view a variety of high-level and detailed options for understanding rule execution. Detailed performance reports provide measurements of individual rules down the fraction of a millisecond, while trace logs identify which branches of logic executed and in what order. irVerify’s easy-to-understand interface allows business users to perceive how the input data dictates rating decisions in a development environment.

## What-if-Analysis

In addition to reporting, InRule allows analysis to be extended from real-world data to what-if scenarios. The flexibility of irAuthor permits carriers to determine what their loss experience would be if certain hypothetical situations occur or if specific rules are adjusted. This not only tests the robustness of the rules, but also allow for adjustment of premiums to account for unanticipated risk or development of additional rules to harden the logic supporting the ratings engine

## Integration with Other Systems

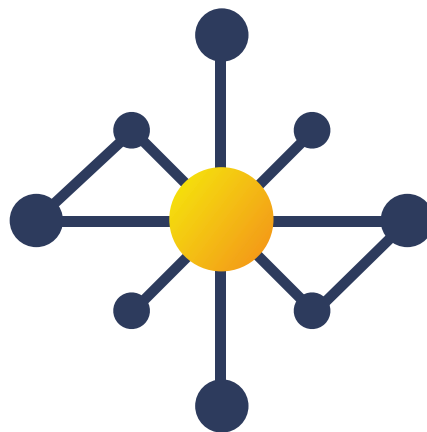
A decision platform is clearly not a stand-alone system. It should integrate seamlessly with other systems throughout the enterprise architecture, including both the internal architecture and externally facing portals.

Specialty Insurers are increasing their reliance on a multi-channel approach to obtaining and retaining customers. Some customers want to speak with an insurance agent, while others want to use a website or mobile application. Some customers may start with one channel and switch to another. They may start their request on a website, then use a call center to complete their policy. What is important is that all of their information is captured, and they don’t have to repeat the entries that they already made.

InRule allows the Specialty Insurer to embed the ratings engine in the middle of all these process flows. By placing the rating engine in the middle and working out to the channels, insurers can develop the engine once and use it in multiple channels.

While the InRule Platform has its origins in .NET, carriers do not have to be a .NET organization to use InRule. With today’s service-based architectures, InRule integrates with almost any type of application (desktop, web and mobile) or platform (Microsoft Dynamics®, Salesforce® and more). In fact, a pure JavaScript development stack has integration options without using .NET including native execution. InRule addresses the market largely from a polyglot (many programming languages) orientation and is generally agnostic with regard to devices and cloud platforms.

One Specialty Insurance company wanted to expand its reach by providing the ability for some of its independent agents to bind policies. To make this process as easy and seamless as possible, the organization needed to deploy a ratings engine through their external portal. This required the integration of the ratings engine with their agent portal. The InRule architecture allowed the company to integrate the ratings engine with the portal, providing independent agents with binding capabilities. This led to the company doubling the premiums produced by their independent agents, adding over \$175M in less than five years.



# SUMMARY: THE VALUE OF THE INRULE DECISION PLATFORM TO THE SPECIALTY INSURER

**The InRule Decision Platform** allows a Specialty Insurer to be more agile in the marketplace, both by Based on loss experience, underwriters may find that drought is lowering lake levels resulting in an increase in claims caused by boats hitting submerged objects. If this results in vessels with a specific type of hull having loss experience at a greater rate than originally anticipated, the insurer may elect to adjust the discount for these hulls. InRule provides the capability to quickly adjust the rule set to accommodate this new condition. Additionally, InRule promotes consistency of vocabulary, making adjustments and rule sharing easier. All properties have owners. Owners' financial history is usually part of the ratings process. Once "Bad Financial History" is defined, it can be reused and specialized for a given product line. "Bad Financial History" can be the base definition. "Bad Financial History-Boat Owner" can specialize that base definition. Having a consistent implementable vocabulary removes ambiguity and encourages reuse.

In addition, this rapid feedback to action cycle has enabled the company to take on more risk because it knows that it can adapt products more rapidly to

changes in observable risk and market conditions. Defining each term precisely provides a consistent structure that allows the insurer to test historical claims under different conditions and adjust the ratings decision, impacting the bottom line.

Response time to implement requests for change is also decreased. The combined degree of specificity of the requests, the ease of authoring, testing and moving changes into production decreases the time to implement changes. One InRule customer rolled out more than 35 production version changes of their ratings engine in a single year and many organizations turn over changes weekly.

The same customer also reported that time to market of new products had also been reduced from six-to-nine months to three. This is because of consistency of definitions, ease of authoring and adapting rules for reuse.

In addition, this rapid feedback to action cycle has enabled the company to take on more risk because it knows that it can adapt products more rapidly to changes in observable risk and market conditions.

## MOVING FROM FEATURES TO PRACTICE

Effectively deploying a decision platform is a balance between the technical challenges of architecture, execution, integration and human interaction.

From training and workshops to rule authoring, and architecture and integration assistance, InRule offers a range of professional services that aid in success for implementing a decision automation program. Refer to <https://www.inrule.com/professional-services/> for details. For the purposes of this paper, we will focus on how an organization gets started with a decision platform



# Implementation Journey: Discover, Engage, Build, Scale

In this section we will look at the methodology for the successful implementation of a Decision Platform. InRule provides a series of workshops focusing on the various stages of the methodology.

The figure below indicates the key stages of the methodology:



## Discover

During the Discover stage, workshops focus on developing the environment for the project. This consists of gaining stakeholder agreement on:

- The problems that will be solved
- How success will be measured relative to the investment and in what time frame
- The active risks to the project and known remediation
- The business value as a metric or KPI

Unless there is agreement on these items there is a risk of achieving the wrong objective.

The Discover stage also identifies candidate projects. Considering all the possible projects, what are the best candidates? In the Specialty Insurance ratings arena, what offerings are best

suited for developing the initial version of the engine? Selection needs to balance several factors including:

- Is there adequate knowledge of what factors influence the risk and by how much?
- Are the right people available to serve as rule authors?
- What are the characteristics of the right people?
- What would be the value of success?
- Can a prototype be defined so that it is achievable in a reasonable timeframe and still offer value?

These elements need to be discussed, documented and agreed upon before major resources are assigned to the project. The result is a common vision for the expectations of the project.

## Engage

The Engage stage of the program includes:

- **Decision Modeling**
- **Rule Authoring**
- **Technical Blueprint**
- **Integration**
- **Delivery**

## Decision Modeling

The overall goal of decision modeling is articulating decisions through KPIs, models, notation, schemas and vocabulary. This process establishes what is going to be decided, what terminology is going to be used to make the decisions and where the data will be sourced from. This provides framework for the decision platform.

Two of the keys to decision modeling are agreement on the vocabulary that will be used to make the decisions and where the data to instantiate a given rule is sourced. Depending upon the state of overall information governance within the enterprise, this may be a very straight-forward process or may involve numerous discussions of what a certain term means or from which system the data is pulled. Some of the key activities in decision modeling are:

- **Agreeing to the data structures that will be used for the project**
- **Agreeing on specific vocabulary for the problem domain**
- **Understanding the decisions impact on the business process**
- **Demonstrating how the decisions will be organized**
- **Determining the rules that will be authored**

If multiple teams are sharing data structures, they must coordinate and agree on any changes.

## Rule Authoring

Rule authoring is comprised of both author training in InRule's authoring tool and the actual creation of rules identified in the decision modeling stage. This not only involves writing the rules, but subjecting them to peer review and verification to determine if they yield the expected results.

## Technical Blueprinting

Technical blueprinting involves the next level of determining how InRule will interact with the organization's information technology infrastructure. This includes identifying:

- **Where the decision platform will be housed**
- **Where and how data will be sourced**
- **How the results of the decision platform will be integrated**
- **What application connectors or SDKs will need to be used or developed**
- **What performance capabilities are required and how will they be achieved**

InRule provides reference architectures and sizing guidelines for typical scenarios and recommended methods for implementation.

## Integration

Integration is the phase where the technical blueprint is put into practice and tested. The connectivity between the various pieces of the infrastructure are built and tested. This includes integration, performance and user acceptance testing

## Delivery

Delivery involves the actual rollout of the decision platform to the user environment. In most cases this will involve some form of user training. In cases when the decision platform represents a large change in the way people do their jobs this area may require some change management activities to take place.

Delivery also involves looking at the system's performance in actual rather than anticipated conditions. Is it working as expected? What improvements can be made Are the users using the platform for the purpose for which it was designed? Or are they using it in unanticipated ways? If the

latter is true, it is not necessarily a bad thing. At times, users find good uses for a decision platform that the original designers did not anticipate. At other times, safeguards may need to be put in place to avoid misuse?

## Build

The Build stage involves both maintenance and improvement of the delivered project. It also involves coordination of projects in their various stages. The Build stage consists of:

- **What-If Experiments**
- **Governance Practices**
- **Risk Reduction**

## What-if Experiments

As mentioned before, What-If scenarios involve looking at what would happen if changes were made to the decision platform. For example, if a rule in the ratings engine were changed to lower premiums for a given rare risk, would that increase market share? At the same time, how would that affect the risk of loss? Incorporating this InRule functionality into the regular operations of the Decision Platform Program allows the organization to use InRule as a vehicle for continuous improvement.

## Risk Reduction

Risk reduction refers to technical risk. Usage of a decision platform will change with time both from adoption and expansion of scope. This could put more stress and change the requirements for the technical architecture. InRule provides for performance monitoring that can be analyzed in order to determine if action should be taken.

## Scale

The Scale stage has two components: stability/predictability and people multiplier.

Stability/predictability refers to the organization's ability to bring new projects into production, roll out enhancements to existing projects and maintain service levels with consistency.

The people multiplier refers to the organization's ability to meet or expand its capabilities in the decision platform arena as demand increases. This requires the organization to establish and maintain

processes and practices as well as the necessary infrastructure

## SUMMARY

We have examined the unique needs of the Specialty Insurer in terms of ratings engines. The Specialty Insurance market supports a wide and constantly expanding variety of risks. Therefore, a ratings engine must be agile and adaptable. It needs to speed the time to market of products and be integrated into the entire enterprise technology stack, from billing to sales. InRule supports all of these requirements.

In some cases, depending on the size and complexity of the decisions modeled, a workshop can go from discovery to a working application in a few days. In other cases, where the decisions are broader and more complex, such as underwriting, the harvesting of requirements may take longer. This may extend the length of the workshop to a month. In either case, the workshop accelerates the time to value for the Specialty Insurer.

One customer using InRule reported a decrease in time to market of new products from six-to-nine months to three. The same customer stated that they increase revenue by \$175M from independent agents by rolling out their ratings engine. InRule contributed to this by providing the insurer with a platform that allowed them to develop, maintain and adapt their ratings engines with confidence and agility.

A ratings engine sits at the core of a Specialty Insurer's multi-channel strategy. InRule provides both the technology and processes to accelerate time to market and adapt products to increase their profitability.

To learn more about how InRule works with commercial insurance carriers, visit <https://www.inrule.com/industries-customers/insurance/>.



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