R^3S Software Suite

Simplifying the complexity of actuarial, regulatory and risk-based requirements.

RNA ANALYTICS

Experts in sophisticated actuarial models and advanced modeling software.

Introduction

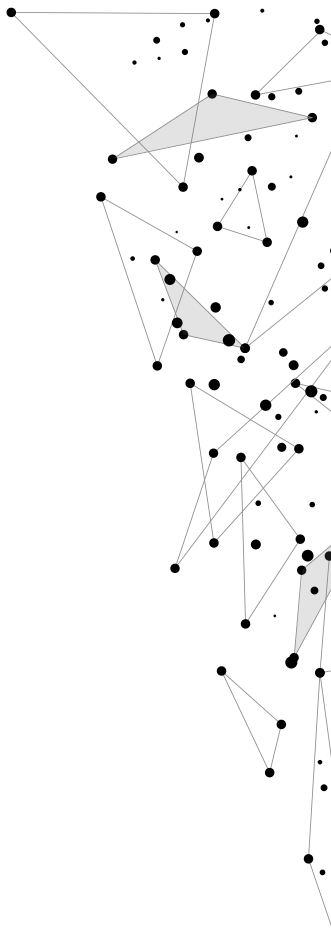
R³S is a software solution for financial, risk and actuarial analysis. It is designed and developed to help companies meet their need for more realistic and granular modeling in financial analysis and regulatory compliance.

With R³S, RNA Analytics aim to change the way in which risk and actuarial software is used across the business and to provide a platform that can be utilized by all departments, from product development, pricing, financial and regulatory reporting through to the risk function.

By using a single software suite, users can use a consistent set of calculations, approaches and skills to improve on the granularity, accuracy and speed with which they can produce information and metrics. The flexibility with which the suite can handle calculations, data and processes enables a business to implement the approach where it can realize most value.

With software that can run full nested stochastic dynamic asset and liability management (ALM) models in the cloud, users can model the real-world interactions and decisions and then stress and investigate these to understand the risks and their impact on the business. All of this is underpinned with a process workflow and governance element that allow automated runs to occur at a time of your choice, as well as perform one-off runs as the business responds to internal and external needs.

Software offerings



R³S Modeler

R³S Modeler is a current-generation risk and actuarial software tool designed to cater for the needs of insurers when complying with regulatory and other reporting requirements, undertaking product development or investigating their risk exposure.

With many regulations and reporting standards taking a principles-based approach, flexibility is paramount in deciding what tool to use. Flexibility was central to the design of R³S Modeler when it was initially developed and this continues to be the case. It enables users to build models to perform many types of calculations and is most commonly used for product pricing and design, budgeting, statutory valuations, market-consistent embedded value valuations, IFRS 17, asset and liability management (ALM), economic capital and Solvency II calculations.

R³S Modeler is software that enables users to build reusable components covering:

- Access to external data from multiple sources
- Multidimensional tables of assumptions stored and managed internally or externally
- Programs that define the calculations, which can include interactions between different programs
- Granularity of output necessary to populate required reports

Users can bring these components for data, assumptions, programs and reports together to build models to meet different risk and actuarial requirements. R³S Modeler generates highly-optimized executable files that can be run locally or in the cloud to give results that can be accessed using R³S Modeler, Microsoft Excel® or other third-party reporting tools.

R³S Process Manager

With the increasing focus on risk management through regulation such as Solvency II, reporting standards such as IFRS 17, and IT compliance standards, the way that business-critical modeling systems are used, managed and deployed within an organization has come under greater scrutiny.

It is important to ensure that access to business-critical models is thoroughly managed and controlled. Minimizing the possibility of manual intervention, protecting model integrity and avoiding overdependence on individual resources are essential parts of managing and containing operational risk.

R³S Process Manager is a workflow solution designed and developed for executing models developed in R³S Modeler and managing the process around the execution. R³S Process Manager can also manage data files and single-file-based database inputs and Microsoft® Excel reporting spreadsheets associated with the models to provide a full end-to-end managed process. Process Manager provides the security and governance around access permissions and model versions between reporting periods and implements approval and verification processes on inputs, models and reports.

R³S Toolkit

The R³S Toolkit enables users to build their own interfaces and dashboards so that they can run models or embed the running of models in other applications to provide flexibility in how to control these processes. Modeler can generate and compile a model to produce a run archive file. The toolkit provides a set of APIs that enable a model to be run from a run archive file. These APIs are the basis for Process Manager, a ready-made solution, that shows how the toolkit can be used to embed the running of models in a secure, structured, process-driven framework. The key benefits of the toolkit are:

- It enables users to run models from outside of R³S Modeler, thus providing a clear distinction between employees who develop models from those who run the models.
- Users are not required to have either R³S Modeler (including a compiler) installed on the PC from which the application using the Toolkit is run.
- It removes the need to have a license for the users of the developed models.
- It can be installed alongside other applications and used to build an automated production environment.

R³S Development Manager

R³S Development Manager enables multiple R³S model developers to work on the same codebase at the same time.

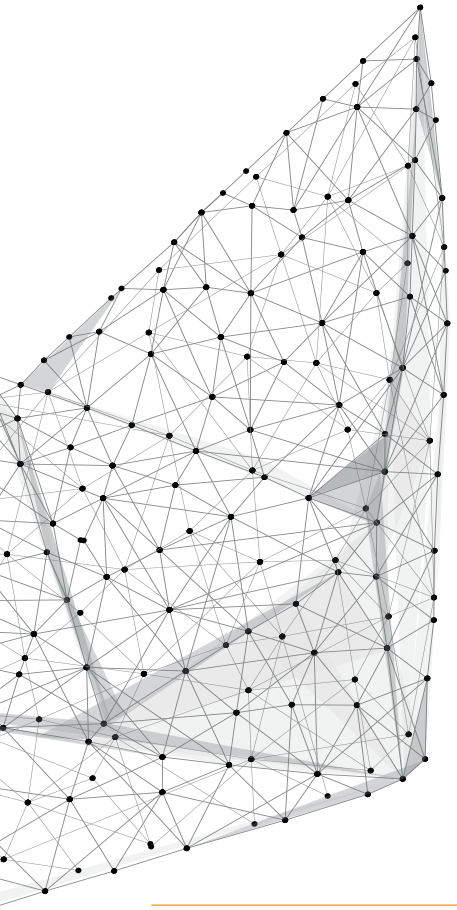
Model developers create a local sandbox copy of the code library from the R³S Manager server where they can add and check-out components so that they can make changes to the code. Models can be run to test the code changes before the changes are checked-in to the server in a changeset. Other users can then synchronize to the new code, even if they have made changes to other components in their own sandbox.

The R³S Manager server maintains a history of the code changes and changesets. This allows a user to create a snapshot of the codebase at any changesets to be able to review, build and run R³S Models based on that codebase. If run archives are built from these snapshots, then they contain information to identify the point in time of the codebase, this can be seen in R³S Process Manager.

Model Packages

Standard Code

Whether starting out with a new software system, developing and pricing new products for launch or implementing new regulations, building accurate and realistic models as quickly as possible is a common requirement.



To help facilitate this process, there is an extensive library of standard code installed with R³S Modeler for a wide range of assets, liabilities and processes. The standard code is primarily a collection of modules known as building blocks. These are relevant to most markets and can be fitted together to form assets, liabilities, products and calculation routines.

Designed to ensure that the code is fully modular and extremely flexible, the building blocks are collections of common calculation routines, such as probability calculations, that interact with one another seamlessly and without the need for additional coding when used in a suitable combination. They are written using expert local knowledge. Users can easily create programs to fit specific requirements by bringing together the relevant building blocks.

The consistency provided by the shared building blocks enables multinational users to report across all offices in a standardized manner and enables the models of different business units to share the same code. This is a key advantage in international projects and for risk management, as well as for smaller companies wanting consistent model code across all functions.

Solvency II Package

The R³S Solvency II standard code package includes a comprehensive Standard Formula solution and example processes and approaches for developing partial or full internal models or the forward-looking assessment of own risk (FLAOR) requirements.

Standard Formula

The R³S Solvency II standard code package includes a comprehensive Standard Formula solution for insurers seeking to cost-effectively adopt an approach to comply with Pillar 1 of Solvency II. Designed for speed and quick-start deployment, this solution includes a template capital model that can be adapted to your own business and an out-of-the-box model built around the Delegated Act text carrying out the aggregation of the risks and producing the metrics required for the Solvency II quantitative reporting template (QRT) reports.

FLAOR

The R³S Solvency II FLAOR and proxy (curve fitting and least-squares Monte Carlo) models offer insurers an innovative approach to improving the efficiency of full and partial internal models for projecting solvency capital requirements (SCRs). These allow clients to support Own Risk and Solvency Assessment (ORSA) calculations without investing heavily in new hardware.

By providing a flexible framework for users, clients can implement either a fully nested stochastic model or a fitting method of their choice. The sophisticated design of this model enables firms to use proxy modeling in R³S Modeler with existing actuarial models to provide the maximum benefit with the minimum effort.

IFRS 17 Package

The IFRS 17 standard code has been updated to reflect the final text and is already in use by insurers. The R³S modeling system offers strong capabilities for ALM best-estimate calculations. Whether starting the best-estimate liability (BEL) calculations from the beginning using standard code to accelerate development or making use of an existing BEL process the IFRS 17 reporting model is designed to enable insurers to rapidly develop their IFRS 17 compliance.

The IFRS 17 standard code provides an out-of-the-box solution to the portfolio-level calculations of balance-sheet and profit-and-loss values required under IFRS 17. These IFRS 17 portfolio-level calculations use a defined set of cash flow model inputs, which can be taken from any underlying source, including from R³S Modeler results for maximum automation.

The IFRS 17 model can be used for the initial recognition calculation, subsequent measurement reporting and the one-off transition calculation.

Aimed at changing the way in which risk and actuarial software is used across the business, the R^3S software suite provides a platform that can be utilized by all departments from product development, pricing, financial and regulatory reporting through to the risk function.

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