Case study: Risk-AI
Simplifying Hedge Fund Risk Management

Risk-AI is an award-winning risk management firm offering hedge fund investors and advisors a cloud-based analytics and research portal for funds of hedge funds, family office, and investment consultants. Risk-AI didn't want to reinvent the wheel when building the underlying mathematical and statistical foundation for their innovative hedge fund risk analysis and forecasting solution. A review of similar tools found gaps in usability and support that didn't fit the company's desire for a comprehensive and easy-to-use solution. Staying true to their “most people want simple solutions” philosophy, Risk-AI standardized on Rogue Wave IMSL Numerical Libraries for their ease of integration, reliability, helpful documentation, and completeness of functions.

Making award-winning technology practical

With several years of hedge fund operations and risk management under his belt, Risk-AI Senior Partner and CEO Aleksey Matiychenko found the risk analysis software industry to be lacking. Most products were built for enterprise-class users that were stuck in a quantitative analysis regime that focused on complexity and academics rather than practicality and ease of use. They were designed by PhDs for PhDs and unsuitable for smaller hedge fund consultants who couldn't afford to purchase and train themselves on top-tier products.

Matiychenko explains, “Imagine a jet fighter cockpit that's very complicated and takes very special skills that few people posses to operate — this is what most risk systems look like. That's fine for the larger firms, with layers of systems and teams of quantitative analysts and risk managers. We draw our inspiration from the dashboard of Porsche 911. Five dials with most important information right in front of you.”

Starting in 2008, Matiychenko and his partners took their practical experience in risk management to build the Risk-AI Online Portal analysis tools for smaller hedge funds and multi-fund portfolio managers. Unlike large investment firms with teams of people sitting behind desks, these types of users are usually one or two people who work outside the office, conducting personal research and interacting with clients on the ground. Understanding their needs is Risk-AI's priority and this demands simple, results-driven tools.

“For anything analytical, IMSL is the default — we haven't found anything better.”
Aleksey Matiychenko, Risk-AI Senior Partner and CEO
“We offer a great set of tools and, more importantly, they’re really easy to use. It takes a lot of effort to make it clean and simple. Bigger companies have not been able to reproduce what we have.”

In 2012, Risk-AI became the world’s first company to produce a mobile app for hedge fund analytics, targeting both Apple® iPhone® and iPad®. In 2013, the firm partnered with Hedge Fund Research Inc. (HFR) to offer the first hedge fund database app on mobile device. To honor their achievements in the risk management industry, Risk-AI received the 2013 International Hedge Fund Award as the U.S. Risk Management Outsourcing Firm of the Year and in 2014 the award for the best cloud-based risk management software.

Managing risk management
When developing their products, Risk-AI needed a set of analysis and modeling functions that met the needs of their end-users while also keeping code integration simple. Providing features that could manipulate historical data from thousands of hedge funds across a number of years meant the company needed algorithms that were fast, robust, and well documented.

These included:
- Regression analysis
- Numerical optimization
- Cholesky factorization
- Bayesian logic
- Monte Carlo simulation
- Multivariate normal simulation

The company looked at a number of well-known tools to satisfy their needs. While these tools satisfied some functional requirements, the functions themselves were hard to understand and to integrate.

Keeping things clean and simple is a philosophy that Risk-AI is proud of and inherent in the functions provided by the IMSL Libraries. With comprehensive documentation, extensive sample code for class libraries, and a completeness of functions, the IMSL Libraries were a perfect fit.

Simplified for the people
Risk-AI saw immediate benefits by integrating the IMSL Libraries into their code base, saving both time and development costs. Some benefits came in surprising ways, as Matiychenko explains. “One feature we provide is seeing how different investments perform in different markets, where you have to estimate performance. Initially we used MATLAB but then found the IMSL Bayesian tools to better automate the process.” The strength of the functions combined with their ease of use has made the IMSL Libraries the algorithmic tool of choice for the company. “For anything analytical, IMSL is the default — we haven’t found anything better.”

The power of the IMSL Libraries has directly benefited Risk-AI customers — smaller hedge fund consultants that want to offer world-class risk analytics to investors. With an IMSL foundation, Risk-AI is able to offer various fund history analysis, market sensitivities, and risk simulations that enable clients to make better, more informed decisions. Risk-AI also leads the industry by offering mobile versions of these same tools. Says Matiychenko, “I’m a big fan of IMSL’s rich set of functionality. I’ve always brought in IMSL when consulting and it lets us build a good set of tools that are easy to use and simple for our clients.”