

Rational Suite AnalystStudio— Integral to Pharmaceutical Research Software Development at Synomics

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The pharmaceutical industry invests enormous resources in its continuing efforts to develop new and better drugs. Because of the extensive and costly research involved, a single drug can cost \$700 million to bring to market—and many that make it to market are ultimately neither well-differentiated competitively, nor profitable. As a result, the industry is making significant investments in new data generative research technologies in the hope that more cost-effective and predictive ways of performing drug discovery can be found. Researchers use software tools to analyze extensive amounts of data in order to characterize diseases and identify potential new therapies. By using computers, scientists hope to select those projects that are most likely to succeed by correlating information from a wide range of sources.

Barely two years old, Cambridge, England-based Synomics Ltd. is an aggressive, innovative company bent on making inroads into this important new market. The rapidly growing research informatics company provides enterprise integration applications, tools and services for the pharmaceutical industry. These tools allow their customers to integrate and protect legacy applications and extend their utility within the drug discovery process. Because the pharmaceutical research and development

organizations use a large variety of core tools—discrete applications that are highly focused on particular types of scientific data analysis, which are provided by a large number of software vendors—there is a critical need to link these diverse tools together in a sustainable way. Synomics is uniquely filling that need with its Alliance architecture, which it is developing using Rational Suite™ AnalystStudio™.

Tool Acquisition Begins with Rational Rose

Synomics chose Rational Rose® as its modeling tool, in great part because of its use of the Unified Modeling Language (UML). "We believe in the UML as the basis for modeling. We use it for composition and design. It's important for our own designs and for how we're going to operate with our customers. That's the primary reason we chose Rational Rose—but we also want to associate with a leading company to give our customers the reassurance that we're using the right sort of tool vendor; that is Rational Software," said Geoff Gardiner, Head of Quality Assurance.

“Developing new,

better medicines

and getting them to

market is important

to all of us. It's

rewarding to

know Rational is

involved in this.”

“For Synomics,

UML modeling is a

sine qua non.

Without Rational Rose,

it is likely that the

Synomics design

would be less advanced

than it now is.”

Additionally, developers at Synomics spend a significant part of their time working with their customers and collaborators to understand the problems or challenges they face within their organization; in particular the data they're working with, the types of analysis tools they use, and the complex interrelationship between different data and analysis tools. They find that having access to the UML is a powerful way for technical staff, scientists, and non-technical staff to communicate with each other about processes and experiences.

The ability to model around use cases was another key factor in the selection of Rational Rose. “Our experience is that use-case based requirements are a good method of describing interactions with the types of systems we are developing, and also that modeling, at various levels from conceptual to detailed implementation, is a good way of explaining and understanding architectural and design issues,” explained Gardiner. “We have used Rational Rose from the outset as our modeling tool to provide us with a clear statement of the architecture and a strong technology-independent design. The conceptual models are used to communicate with customers’ own domain specialists who, though computer-literate, are not necessarily programming experts. Customers will be able to develop extensions of our systems themselves using suitable tools, and for this we were looking both for a robust modeling methodology and for a vendor with sufficient standing for our market. We are developing test harnesses directly from the evolving Rational Rose models in order to exercise new software implementations without delay,” he added.

Rational Suite AnalystStudio Rounds Out Capabilities

Satisfaction with Rational Rose and the need to add project management, document, test and quality assurance capabilities led Synomics to acquire Rational Suite AnalystStudio, providing the organization with a full suite of integrated products including Rational Rose for modeling, Rational Requisite®Pro for requirements management, Rational ClearQuest™ for incident and change request management, the Rational Unified Process for “best practices” guidelines and process mentoring, and Rational SoDA® for documentation. Each tool fills a critical need in Synomics’ development process for all customer projects.

“We are convinced that rigorous requirements management is key to the success of projects,” Gardiner said. “Rational RequisitePro can support the use-case methodology we employ, and appears destined to integrate with the other tools we have and plan to use. We have designed our RequisitePro templates to support the simultaneous implementation of the engineering, the documentation and requirements-based tests. This should result in fast delivery of a product known to meet its stated requirements.” RequisitePro will allow Synomics’ highly service-oriented development organization to make sure its products fit the exact requirements of its customers and ensure that these requirements are specified and managed all the way throughout the development process.

The organization is replacing its current company-designed tool with Rational ClearQuest, spreading its change request workload across the whole team rather than limiting access to a handful of project leaders and Quality Assurance. “This is only feasible with a well-controlled workflow such as that available with ClearQuest,” Gardiner said.

Rational ClearQuest's degree of integration with other applications such as email, Rational's testing tools, leading database management systems and source code control will enable incident reports to be entered just once and then tracked through to fixes and upgrades to the models, code, testing and documentation. "That's critical to the area of business we work in," noted Gardiner. "Different customers within the pharmaceutical industry will have different ways of applying information and knowledge to the problems they are working on. They will want variations on the types of solution we're offering. Also, they work within an environment of change, so we anticipate that their requirements will evolve with time and their models will have to be updated. Having a system through which change requests can be propagated is extremely valuable to us."

Finally, Rational SoDa has started to provide all Engineering and Product Management staff with the basics for report generation and customization.

Rational Unified Process Provides Useful Reference

Developers are already taking advantage of the Rational Unified Process, an online collection of engineering best practices and guidelines supplied with Rational Suite AnalystStudio that can be browsed, navigated and searched via a standard web browser. "Having the Rational Unified Process tool as part of this suite of programs is useful not only because it's an online reference but also because it has specific links between general (abstract) processes and specific tools we're using—for example, an abstract about doing requirements management, and specific instruction on using Rational RequisitePro for requirements management. It's a very useful way of learning, and very helpful for rolling out in the company. In the future, it will be even more useful as we customize it to reflect our specific ways of working," said Gardiner.

“The market we’re dealing with is one in transition at the moment... Our customers are learning what tools they actually need. By supporting them with the tools we have from Rational, we’re in a strong position to manage those changing needs within our Engineering team.”

Transitioning Market Creates Challenge and Opportunity for Synomics

Like many other software companies, Synomics faces a number of common technical challenges including budget and time constraints and the need to design enterprise-wide systems that are robust, scalable, and high-performance. Its particular challenges lie in linking many diverse, pre-existing data sources to each other and to a variety of specific user types—while maintaining an architecture and design that can be readily extended in both dimensions—in a market that is only beginning to define its needs.

"The market we're dealing with (the life sciences industry) is one in transition at the moment," explained Rowan Evans, head of Marketing. "It's changing from a purely research-based approach to drug discovery to a more predictive, knowledge-led process. Leading Pharmaceutical companies work with companies such as ourselves to develop software tools that can solve problems now and adapt in the future to their changing requirements. As their needs change, the tools that they use need to change too. By using the tools we have from Rational, we're in a strong position to manage and respond to those changing needs within our Engineering team."

Synomics to Help Customers Gain Development Skills

Over time, Synomics is looking to deliver a range of professional services that may equip its customers to use Rational tools in conjunction with its products. "When we roll out solutions into a pharmaceutical industry, we want to ensure that engineers at our customers' sites have the same tools at their disposal so they can tailor the products to meet their individual needs," said Evans. "This helps them change the underlying models of certain systems, use the UML, and use Synomics' Engineering process within their own organization. Investing in off-the-shelf tools from Rational that support open standards and the Rational Unified Process is a way of our being able to support that skill transfer process."

Synomics anticipates that training, consulting and skills transfer into the pharmaceutical organization will be necessary to ensure that the pharmaceutical industry can use information as effectively as possible and derive maximum benefit from Synomics' product offerings. "The way our products and their information sources are used within their organization is a key differentiator of competitive advantage in the pharmaceutical industry—it is important for them to be able to develop systems themselves", noted Evans.

Synomics Anticipates Qualitative, Quantitative Benefits from Rational Suite AnalystStudio

Rational Suite AnalystStudio has been provided to nearly all staff, including Project Management, Engineering, Documentation, and Quality Assurance, and is being used in all development projects (the test organization has access to Rational Suite™ TestStudio™ instead). A floating copy of Rational Rose Enterprise 98i is available for occasional new needs. At rollout stage, it is too early to document specific improvements. However, Synomics anticipates a number of qualitative and quantitative benefits, both in terms of avoiding problems it would expect to have without these tools and of improving its Engineering effectiveness and efficiency that justifies its purchase.

Synomics is also looking forward to taking advantage of Rational's continuing development, deployment and integration of the tools in Rational Suite AnalystStudio. In fact, this was a key consideration in selecting Rational in the first place. "Part of our reason for going with Rational is that we expect the company to be at the forefront of developing these tools," said Gardiner. "We expect to reap the benefits of the development process that Rational itself is selling; we expect that Rational will continue to be at the forefront of standards development and conformance; and we expect that many third-party tools will be available for augmenting the standard product. Also, with Rational's financial strength, we have the expectation that they will be a leader in these tools and that our customers will benefit from Rational's position of strength."

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