

Project Note

More Efficiency and Flexibility

Model Driven Development with Rational Rhapsody® – an example from the machine industry

Customer-specific systems with a high percentage of reusable components. soplar s.a. is mastering this challenge extremely efficiently with Model Driven Development and Rational Rhapsody® from IBM. A conversation with Reinhold Wüstner, Product Development, and Vitali Mozgovoi, Software Development.



soplar s.a. with headquarters in Altstätten, Switzerland, is a well known provider of stretch and tube blow molding systems for plastic packaging. About 30 people work in the development of the technologically demanding machines, including seven in the area of control software. soplar had already switched from IEC 61131-3 to Model Driven Development in 2002. Early in 2006 the company decided to introduce IBM Rational Rhapsody®. The deciding factors for this step were the full consistency of models to code (automatic code generation) and the possibility of generating code from Rhapsody® structure diagrams (ports).

Seven months to product introduction

Reinhold Wüstner explains how only seven months passed from the introduction of Rhapsody® until the first machines were delivered. “Initially we had external support in the area of process design. After that we had to help ourselves – with lots of learning on the job. Today we have four machine types in use with Rhapsody®.”

Expectations completely fulfilled

soplar s.a. considers the following advantages of Rational Rhapsody® to be especially important:

- Cost savings: developing more machines with fewer employees.
- Shorter time to market: substantial time savings, especially in product upgrades and integrating new functionalities.
- Higher quality: up to 60% fewer defects.
- More flexibility in resource planning: more flexible use of employees thanks to models.
- Easy introduction of new employees.

**Reinhold Wüstner,
Product Development,
soplar s.a.**

“We would repeat our decision to choose Rational Rhapsody® at any time. The strikingly improved efficiency, higher quality, and flexibility plus reusability of models make any adverse details negligible. Today we develop more machines with fewer resources in less time.”

	Model Driven Development	Requirement Management	Product Line Engineering	Testing Solutions
Consulting / Coaching				
Training				
Tools				

Fewer errors without a debugger

“In five to maximum seven months, we develop the software for a new machine,” adds Vitali Mozgovoi. He complements that the automatically generated code is of secondary consideration. “Above all, it’s the modeling capabilities of Rhapsody® that make it an indispensable tool for me. Thanks to executable models, we can detect errors quickly at an early stage. And since the models are self explanatory, we can use everyone on the team to find errors. We even don’t need debuggers anymore.”

Lessons learned

In retrospect, soplar concedes they probably allotted too little time for the changeover. Up-front investment in infrastructure, consulting, and coaching as well as goal-oriented and needs-focused training would have paid for themselves quickly through increased efficiency. As seen through Reinhold Wüstner’s eyes, internal and external exchange of experience and information is another critical success factor.

Limits of Rhapsody®

According to Vitali Mozgovoi, the general handling of Rational Rhapsody® could still be improved. Simplifying the interfaces would also be a further benefit.

Extending the use of Rhapsody® to the mechanical engineering and construction is for the time being not a matter of discussion for Reinhold Wüstner. “The tool exceeds our requirements, especially with respect to the user interface, which is too complex for an effective introduction“. A solution with which the user interface could be configured according to the specific needs would be optimal.

Looking ahead

Currently Reinhold Wüstner’s main concern is memory management. “We need more and more memory, which in some cases may be attributed to our design and methods. Although this topic is not critical to success for soplar, we would like to optimize processes with the support of EVOCEAN for the next generation of machines.”

Potentials for further efficiency improvement would lie in the optimization of both, loading and compiler times as well as the Rational Rhapsody® integration on the target platform.

Technologies used

Development environment	Before Rhapsody®	With Rhapsody®
UML	Artisan	Rhapsody®
IDE	Eclipse, CoDeSys	Eclipse
RTOS	VxWorks	VxWorks
Target platform	Bachmann M1	Bachmann M1
Programming language	C++ / IEC 61131-3	C++
Debugger	Proprietary: Bachmann	None

Vitali Mozgovoi,
Software Development,
soplar s.a.

“Starting to use Rational Rhapsody® without coaching or training is not recommended. Understanding the *why* behind certain processes is essential to working effectively. Training with EVOCEAN was very valuable for me in this regard.”