



# Safety Comes First



Fully automated testing of blood samples is one of the application areas for STRATEC's biomedical analyzer systems. At the core of these analyzers - a Versant object-oriented database.

**In order to eliminate any health risks for the recipients, there are strict testing regulations for blood donations, and each blood sample must pass a series of serological tests (e.g., for infectious diseases).**

**These tests are the scope of STRATEC's biomedical products. The development team was looking for a small but powerful database that was available in "embedded mode" and would not require any database administration tasks from end users.**

"Software development represents about 50% of the overall development costs for complex analyzer systems. This is one reason why STRATEC is disproportionately investing in innovative software development methods."

Jens Mauersberger, System Developer, STRATEC Biomedical Systems AG

## Challenge

STRATEC is one of the most innovative medical engineering companies in Germany. The development team was looking for a small but powerful object-oriented database that was available in "embedded mode" and would not require any database administration tasks from end users.

## Solution

FastObjects was exactly that type of product and offered comprehensive database features such as database transactions, multi-threading and query capabilities at the same time.

## Results

STRATEC analyzer systems are based on an 100% object-oriented program design. As a result, STRATEC could clearly streamline the development process – and deliver products with a long market lifecycle. Customers will not even notice that there is a comprehensive database working in the background of the analyzer, keeping data safe and consistent and managing critical data without failure or downtime.

### Blood Donations Save Lives

According to the World Health Organization (WHO) more than 85 million units of blood are donated every year worldwide. Blood transfusions save lives. However, blood donations must be 100% safe, a growing challenge for blood banks and health providers.

"Large blood banks process thousands of donated blood samples every day," says Jens Mauersberger, System Developer at STRATEC Biomedical Systems AG. "In order to eliminate any health risks for the recipients, there are strict testing regulations for blood donations, and each blood sample must pass a series of serological tests, e.g., for infectious diseases." These tests are the scope of STRATEC's biomedical products.

### Innovation Made in Germany

STRATEC is one of the most innovative medical engineering companies in Germany, developing and manufacturing fully automated analyzer systems for clinical diagnostics and biotechnology. Main applications are blood group analysis, serological tests for infectious diseases and immunoassays.

About 90% of STRATEC's products are licensed and sold through OEM customers, who market the systems under their own brands, including the chemical reagents.

"Modern laboratories and research institutes place high demands on usability, process safety, reliability and throughput," adds Jens Mauersberger. "Manual operations are increasingly replaced by machines. For example, our analyzers scan the bar code of a sample, link the test results with other sample-specific data that is stored in a central database system, and can automatically associate test results with age-related standard benchmarks."

### Software Powering the Analyzer

Aside from the central hardware unit for the bio-chemical analysis, most STRATEC systems are operated with a PC based control software that manages data and test results and provides a convenient and easy-to-use graphical user interface.

"We made some fundamental design decisions when we started to develop our first random access analyzer platforms in 1994. Our applications are based on an object-oriented program design using C++ and more recently the Microsoft .NET platform."

"We also decided to avoid the "object to relational" database mapping process by integrating an object-oriented database into our applications." As a result, STRATEC could clearly streamline the development process – and deliver products with a long market lifecycle.

Faster time to market was not the only reason why STRATEC selected FastObjects. The development team was looking for a small but powerful database that was available in "embedded mode" and would not require any database administration tasks from end users. FastObjects was exactly that type of product - and offered comprehensive database features at the same time.

### The Invisible Database

"FastObjects supports database transactions and multi-threading for high performance, and our development team also benefits from fast and extensive database query capabilities," explains Jens Mauersberger. More importantly, customers will not even notice that there is a comprehensive database working in the background of the analyzer, keeping data safe and consistent and managing critical data without failure or downtime.

### Safety First – Triggered by the Database

Last but not least, in order to avoid faulty operations, STRATEC's software developers have implemented database driven smart alarms, a unique feature of the FastObjects database. An integrated "watch and notify" mechanism constantly monitors certain critical data stored in the database. Whenever any of the used reagents have expired, the analyzer system displays an alarm message – and will refuse to work until the reagent is replaced. After all, safety comes first.

#### About Actian: Take Action on Big Data

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