Star
Software
Corporation

Partnerships Built on Agile Solutions

Star Software: Best Practices

Client: Berghof Automation Technology, Germany
Project domain: Logistics Automation

Background

Berghof Automation Technology is a German high-tech company with more than twenty years experience in the industrial automation field. It specializes in design and implementation of automation solutions for various German customers and has a particular expertise in device and system control and test automation.

Star's collaboration with Berghof started back in 1996 when one of our clients recommended Star's services to Berghof. At Berghof's request, we took on and successfully carried out a pilot project in the field of test automation.

Project scope

In 1999 Berghof entrusted Star Software with a new project building software components for a system, which automated big book storage. This was the start of the logistics automation project series that we have performed for Berghof over a four year period running into 2003.

KNO-Nova (1999)	Order picking control system and material flow control system for the big book storage and distribution center in Stuttgart (Germany).
Adidas (1999-2000)	Material flow control system for the biggest storage of 'Adidas' in Germany at Uffenheim.
Apra-Norm (1999-2000)	Warehouse management system, material flow control system, and host interface for the new automatic storage of 'Apra-Norm' group in Daun (Germany).
Bebro (2000)	Warehouse management system, material flow control system, host interface, and GUIs for workstations at Bebro GmbH's automatic storage facility built as part of the hardware production plant located near Nürtingen (Germany).
Schreyer (1999-2000)	Warehouse management system, material flow control system, and host interface for a new automatic storage facility and distribution center in Metzingen (Germany).
Soft-Carrier (2000)	Warehouse management system, material flow control system, and host interface for an automatic storage facility and distribution center of Soft-Carrier GmbH located in Trier (Germany).
Marquardt (2001)	Material flow control system and host interface to control automatic test equipment located in Marquardt GmbH's production plant near Tuttlingen (Germany).
Beru (2001)	System to control automatic equipment for testing spark plugs with collection of statistical information. The system is located in the Beru GmbH production plant in Ludwigsburg (Germany).

Cargo (2002)	Components for a big material flow control system that controls movements of cargo through domestic German railways. Ordered by Berghof Mühlhausen (East Germany).
Busch-Jäger (2001)	System for visualizing test results on electrical components produced in the Busch-Jäger Electro GmbH plant located in Lüdenscheid (Germany).
Kupa (2003)	Material flow control system guiding automatic production equipment for processing metal units. The system is located in a production plant of Kupa GmbH (Austria).

The end software developed in the course of these projects

- controlled advanced production equipment (including storage equipment such as robots, automated loaders, elevators, and lifts)
- administered automatic test equipment in various production environments, highly optimizing logistics processes.

Due to the homogeneous nature of project work, Star's development team, working in cooperation with Berghof, created a common framework of reusable components each of which performs a separate, dedicated function (e.g. logging, message tracking, database control, event visualization, configuration support, process simulation, etc.). These components communicate with each other and with hardware controllers via TCP/IP telegrams.

During the development we created a powerful library of classes useful for material flow control and warehouse management systems written in C++. The library consisted of universal and optimized classes for database operations, TCP/IP telegram handling, configuration, logging, messaging, scheduling and others common tasks. The class library was made to operate both under Windows and Linux operating systems.

A special useful tool with GUI interface was created to run console applications as Windows NT services. Another useful application written by the development team was a universal editor for databases with ODBC connection with flexible and powerful user interface fully adjustable for the project -specific database via the configuration file.

We also developed a number of useful debugging tools specifically for Berghof projects. One of them was a GUI application for emulating the sending and receiving of TCP telegrams with a user-friendly interface and telegram data validation. Another useful debugging tool was an application, which recorded the flow of telegrams in the real production environment for eventual inspection and debugging off-site.

The ability of reusing these components and tools in all projects with slight changes made to business logic allowed for implementation of each project in a short period of time and with minimum resources.

Technologies

Development Environment: Visual C++ 6.0; ODBC; SQL, OOD; OOP; TCP/IP;
Operating System: Windows NT 4.0;
Hardware Platform: Intel PC;
DBMS: Sybase SQL Anywhere 7.0, Oracle, MS SQL Server

Project methodology

In the course of each project Star Software project team-members worked closely with Berghof development staff to carefully examine and work through the general system requirements in order to come up with a detailed requirement description. Star Software was also responsible for the high and low level system design, implementation, overall system testing. We participated in product deployment.

Among the major challenges, which the Star Software development team had to overcome while working on Berghof, projects were:

- Impossibility of reproducing the customer's hardware environment on-site
- Simultaneous work on several projects
- Frequent on-site trips

- Maintenance and technical support of previously completed projects

In order to overcome these difficulties, project activities were performed in close cooperation with Berghof development staff at all times. The ongoing communication between the client and Star's development team included frequent on-site trips, regular conference calls and an adjusted work schedule. This led to positive project results, enhanced customer trust and satisfaction, and continual business collaboration during the past four years.

Our project development team started off with one person onboard. Later, as number of projects began to increase, it grew to three people.

Project summary

Total effort: 30+ person/months
Duration: 20 months
Team size: 1 to 3 persons
Pricing: Time and Materials

The storage and test automation software we developed is currently being used in book, electronic, computer hardware, and universal storages and production plants. The end customers for it are Adidas, Kno-Nova, Apra-Norm, Bebro, Schreyer, Soft-Carrier, Marquardt, Beru, Berghof Mühlhausen, Busch-Jäger, and Kupa.

About Star Software

Star Software is a leading Russian software-outsourcing provider specializing in the implementation and maintenance of information systems. On November 15, 2002, CIO Magazine named Star Software among the Top Three Offshore Software Developers in Russia. See www.cio.com/ offshoremap/russia.html

Star offers particular expertise in database-intensive applications, migration of legacy systems to web-based environments, application maintenance and software localization. For corporate Knowledge Management solutions, Star Software offers proprietary data mining tools based on NLP (Natural Language Processing) techniques.

Former and current clients of Star Software include CSC/Denmark, IBM/Tivoli, Millennium Pharmaceuticals, Contex Scanning Technologies, STAC, Tupperware, Foss Electrics, LISA (Localization Industry Standards Association), and UNU (United Nations University). Among the end-customers for the developed software are Berghof Muhlhausen, Hugo Boss, Adidas, Schreyer, Danish Ministry of Labor, Danish Ministry of Tax and Customs, and many others.

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