Deutsche Bank Bauspar AG Uses ArcStyler to Embed Existing Cobol Mainframe Application into Modern Web-Based System

Industry

Banking

Application

Web-based system for management of savings and loan association accounts, with internal verification of applications, fully integrated with existing Host application

Business benefits

Flexible system environment for improved customer orientation; Web-based end user interfaces for customers, sales reps and internal bank staff; no redundant data repositories; protection of investment in existing Host application; short time-to-market; business logic model fully independent of technology cycles; system easy to maintain and adapt to future requirements; simplified project handling due to a higher level of abstraction at the model level for improved clarity and communication; consistent implementation and enforcement of a corporation-wide architectural style

Software

ArcStyler, Rational Rose, COBOL application on S/390 Host, BEA WebLogic application server, servlet engine, Oracle database, XML4Cobol for Server/Host communication infrastructure

Deutsche Bank Bauspar AG is a company of Deutsche Bank AG, the leading German bank. Deutsche Bank Bauspar AG provides special savings plans within the framework of savings and loan associations, designed to help its customers build the capital to acquire real estate.

Bringing the Mainframe to the Web

Just like numerous other corporations in the financial sector, Deutsche Bank Bauspar AG uses a mainframe-based system for the operative processes. And just like many other corporations, Deutsche Bank Bauspar AG wanted to offer their end customers additional services: in this case the opportunity to apply for saving plans or get information on existing plans via the Web. In addition, all sales reps and the local bank offices were to be equipped with a Web-based access and management infrastructure.

The benefits of such an approach are obvious. Deutsche Bank Bauspar AG wanted to get even closer to the customer, and, of course, reduce the costs involved in maintaining the desktop-based software in the offices and on the machines of the sales reps in the field.

The objective at Deutsche Bank Bauspar AG was to “migrate” the functionality of the monolithic Host application to modern Internet/intranet technologies, i.e. make functionality of the COBOL components of the existing application available in an n-tier environment.

The company did not want redundant data repositories, a drawback quite a few mainframe integration projects suffer from. Obviously, this project was a major IT-architectural challenge, one of the main reasons ArcStyler was chosen.

ArcStyler for enforcing coherent IT architecture

Deutsche Bank Bauspar AG has developed its own corporate architectural style that is rigorously enforced across all levels of the enterprise. The company wanted an architectural tool that would do two things: first, help the IT department enforce its architectural style by automating the procedures. Second, allow the team to model the business logic of the application at a high level of abstraction independent of a specific technology in order to keep this asset separate from the technology-specific details. In addition, the department wanted automatic code generation capabilities to the maximum degree possible. Deutsche Bank Bauspar AG chose ArcStyler because it offers maximum flexibility and adaptability at all levels – from such ‘high-level’ tasks as the enforcement of a cross-corporate architectural style all the way down to such ‘low-level’ things as automated code generation.

Headquarters

Interactive Objects Software GmbH
Basler Str. 65 · D-79100 Freiburg
Germany · Phone +49-(0)761-400 73-0

Interactive Objects

Making different worlds talk to each other

The 'Web extension' to the existing Host functionality required the Cobol components to be mapped to Java-enabled counterparts in the Web world in order to preserve the original functionality. In addition, a communication interface for the dynamic transfer of the data between these two worlds had to be implemented. Deutsche Bank Bauspar AG opted for an XML-based logic used to describe the Cobol components and Host data structures for access by an application server. The XML4Cobol system is called by Enterprise Java Beans to access the Cobol components represented in the form of XML structures.

Deutsche Bank Bauspar AG chose BEA's WebLogic application server. The server is not installed on the Mainframe, as this would imply unnecessary risks.

In addition to the Session Beans which provide the Host functionality in the Java environment, Entity Beans are used by the system for persistent objects that need to be kept in the Java world before they are 'committed' to the Mainframe. The new Web access forced the team to reconsider quite a few aspects of the data management, such as the fact that all of a sudden there are transactions that are triggered or controlled by customers. For example, customers can now apply for a savings plan via the Web. This data needs to be verified, of course, before it is committed to the Host.

Deutsche Bank Bauspar AG uses an Oracle database for this 'unverified' data. Special functions are provided that notify the staff in charge. Only after verification is the Host transaction triggered via the Internet or intranet.

ArcStyler generates the entire infrastructure

Deutsche Bank Bauspar AG used the ArcStyler to model the entire system and generate the executable infrastructure. Several UML models describe the complete application at various levels of abstraction, with added technology-specific detail at each level of refinement. These models are used to automatically generate WebLogic-optimized code with the Session Beans for the Host functionality interface, the Entity Beans including all persistence aspects for the management of the 'unverified' data, the XML communication infra-structure (such as the XML Document Type Definitions), as well as build, test and deploy environments.

Architectural unit	Percentage of generated code lines
XML interface	100%
Fronted layer	40%
Business layer server	60%
Business layer host	70%
Logical layer server	70%
Logical layer host	60%
Physical layer server	90%
Physical layer host	90%

The relative proportion of generated lines, including comments, for the application-dependent code parts of the individual architectural layers and the artifacts of the interface classes.

ArcStyler Cartridges serve as automation engine

ArcStyler uses so-called MDA Cartridges as the automation engine for code generation. As opposed to previous approaches, e.g. 4GL, these Cartridges are completely open and can be adapted and extended as required. The Cartridges provide an extra layer of flexibility between the UML model and the low-level code. This enables the production of architecture-driven code by enforcing patterns and coding guidelines across all modules. They also ensure a unique location for all changes: changing a single template changes all files generated by that template, no matter how many projects are involved. The Cartridge assures architectural integrity by providing a single place and powerful vehicle for the IT architect to express structures and patterns that define the system structure at all levels. Deutsche Bank Bauspar AG created a customized Cartridge that takes into account the bank-specific architectural style as well as all infrastructure-specific aspects to enable the comprehensive generation of the application.

Outlook

One of the essential benefits of the ArcStyler-based development effort is the fact that this approach saved Deutsche Bank Bauspar AG from having to replace any of the existing systems. The entire logic of the Web extension to the Mainframe system is represented at an implementation-independent level of abstraction in the model. This liberates the company from technology cycles that it cannot control. The ArcStyler did not only speed up the development process while at the same time ensuring superior quality. It also gives the team the flexibility to quickly respond to new technological developments and requirements. For example, Deutsche Bank Bauspar AG is now able to migrate the application to a different application server without incurring major costs.

The flexibility of the ArcStyler's approach is also evidenced by the fact that after the successful completion of this project Deutsche Bank Bauspar AG is now further customizing its Cartridges to generate Cobol functionality for the Mainframe.