



In the late 1990s, competitive pressures were driving Barclays Merchant Services (BMS) to reinvent how it did business. As the card acquiring arm of Barclays Bank, BMS needed to deliver better customer service, more flexible bundling of options, and creative contractual arrangements in an already burgeoning market, all while responding to new critical business needs faster. But the legacy systems at Barclays, one of the largest financial institutions in the UK, made it impossible to deliver the IT solutions necessary to support the bank's new direction.

Today, the successful conversion of its 25-year old systems to client/server based on a component-based, custom-fit application architecture is a key reason why BMS is responsive to change. Because of its new modular and flexible application architecture, BMS can easily modify applications and deliver new functionality that's critical to keeping the business on the leading edge of innovative products and services. Developing new services, providing custom information and reports, and offering flexible contract terms and payment options are just a few of the vast improvements that BMS has delivered to its merchants as a result of its new information systems.

And there's more to come: Because the architecture was built with flexible components, it can continuously transition to encompass emerging technologies and new business requirements to support the growth of BMS's business and new strategic directions that arise including electronic commerce. **An ambitious renewal effort**

But evolution, not revolution, was the direction when BMS embarked on a five-year strategic plan called "Darwin" to reshape its information systems and make them more flexible, robust, and unique -- offering the company a means to differentiate itself.

"Darwin was a strategic investment to support our business direction," says Keith Laverick, senior project manager at BMS. "Our users wanted to introduce a quality customer services function; they wanted to respond more quickly to market changes; and, they wanted far more user control over the parameters that drove the system."

The objective of the ambitious effort was to replace the core processing and servicing

systems, which had been taxed to the fullest extent, and to meet demands that did not exist when the system was installed 25 years ago while carrying forward a wealth of legacy information.

Handling close to three million transactions from 130,000 merchants daily, the Darwin program was a massive undertaking with roughly 20 consultants and 44 permanent IS staff responsible for ensuring its smooth delivery. As part of Darwin, BMS moved from IMS to DB2, from TCAM to CICS, and introduced Micro Focus Cobol on a PC platform. As much processing as possible now takes place on Unix servers while the mainframe still holds the core database and handles high-volume batch processing.

True team effort between business and technology groups

"The reliability, performance, and acceptance of the new Darwin systems have been superb, in fact, in my experience, unprecedented. It is a feat which does not happen often enough in our industry," says James Davison, managing director of BMS. "Darwin is unique because it was a true team effort between business and technology groups at BMS who worked together diligently to plan and implement the delivery of the new systems, which now enable us to respond more quickly to market changes in an increasingly competitive arena."

The systems take care of the daily management of core credit and debit card merchant accounting. Darwin involved re-architecting critical sub-systems including Customer Services, Collections, Recruitment, Settlement, Charging, and Statements.

The business didn't have to wait five years to see any of the benefits. As each new sub-system came online, business benefits were realized along the way. For example, Debt Collection, the first application delivered in Darwin, showed tangible monetary benefits from the start that exceeded BMS' expectations. Customer Services is another area where tremendous progress was made. Instead of disparate customer contact, BMS now has a central services function which has improved customer satisfaction and set the stage for quick resolution of problems.

The Darwin Daily Settlement system was also a significant benefit-driven achievement, representing the successful conversion of over 230,000 accounts from the old back-end payment system. The conversion took place over a single weekend with both systems running in parallel for a period of two months. With its new system, BMS is now

able to price services more imaginatively, increase control over customer funds and reduce the risk of fraud associated with merchant acquiring.

The "smoothest implementation you're ever likely to see"

Laverick and key members of the Darwin program credit Netron Inc.'s custom architecture solution, which allowed BMS to implement its unique functionality into the new architecture, and Netron's component-based development approach as the technological foundation for the success and timely implementation of the new systems. Netron was chosen, he said, for its leadership in software reuse, its proven ability to produce maintainable, high quality software, and its strength in assembling working solutions onsite in short timeframes.

"Darwin was the smoothest large-system implementation you're ever likely to see," explains Laverick. "The sheer size and complexity of the project was our greatest challenge, along with the difficulty of delivering portions of the system incrementally while replacing the old core database. We had to deliver a lot of functionality in a short timeframe with the agenda being influenced to be self-funding in terms of benefit generation. These challenges could not have been overcome without careful planning, high caliber staff, sound project management, sheer determination, as well as the role Netron played in terms of its reuse technology and our solid partnership with them."

Software reuse a key selling point

Darwin began with six months of intensive planning. The idea was to evolve from an IBM mainframe environment consisting of numerous 3270-based IMS applications and large batch systems to a multi-tiered client/server architecture in which applications would be clearly labeled as either enterprise, departmental, or personal.

Following an in-depth evaluation of key players in the software tools market, BMS selected data modeling tools from Cayenne Software together with code construction and software reuse technology from Netron as the foundation for Darwin.

A key selling point was the value of software reuse. According to Laverick, up to 90% of the code was assembled using frames [Netron's reusable components] that had already been created. At most, BMS hand-cranked only 10% original code. The real productivity gains came from the ability to identify where a frame could be used and then reused.

"Reusing existing software sounded like common sense and we bought into it," states Laverick. "We've pursued that theme ever since and seen it turn from a distant vision into a reality."

The benefits of software reuse are twofold. Not only was BMS able to clean up the data in its existing system before converting it to a new Darwin Database, but by using frame technology from Netron, it was also able to construct generic software components which could be reused when developing applications for the new environment.

Laverick points out how the value of such a component-based environment really became apparent 18 months into the program, including the potential for future marketing to other companies. "We were identifying reusable components which made sense because of the way we had broken down Darwin, but then we found they actually made sense across a much broader scope as well. If you have a Statements component and you design it to be reusable, you can solve anybody's statements problem."

A dream instead of a nightmare

A significant portion of Darwin was the Central Database Creation (CDC) Project which involved migrating BMS merchant data from the old system to a new database consisting of four components: Charging, Settlement and Settlement of Charges, Statements, and Merchant Basic Details. Close to 400,000 merchant records, 40 million data fields, more than one million names and addresses, and a host of other information all reside in the central database.

Within CDC, BMS created a reusable framework for converting data files. This is another example of a generic component resulting from Darwin which could benefit other businesses as well. Files of one format are input, various rules are applied, and the data is then output to any number of different file formats. "This turned the final data conversion from IMS to DB2 into a dream," explains Laverick. "It could well have been a nightmare."

"This is commercially viable," he adds. "There's no reason why the world shouldn't latch onto the added value you can get out of Netron and reuse."

Although the client/server environment required new skill sets, BMS employees were shielded from the complexities of learning CICS and LU6.2 communications because the code was already contained in reusable frames from Netron. "Once we knew how to use the frames, then we knew how to write CICS programs," says Laverick.

With help from Netron consultants, Darwin team members invested a great deal of time in the design stage before rolling out applications. Problems were anticipated at the start to avoid "having to code our way out," says Laverick.

"The quality we've put into this process using Netron and our people is extremely high," he adds. "We're evolving away from a traditional waterfall approach to systems design to a hybrid JAD/RAD (joint application design/rapid application development) approach which gives us quality."

Overturning history

Ben Kehoe, BMS systems director, says that the business units are extremely happy with the success of Darwin. "We've overturned more than 25 years of system history and helped streamline the operation of various parts of the business." Darwin will also form the basis upon which future applications can be delivered. "A lot of our systems inventory from now on will be built on Darwin," he says. "Having invested in writing frames, we're now finding we're almost able to assemble systems as opposed to build them."

With the successful completion of Darwin, the project is viewed as a big building block upon which BMS can start to move out into a number of directions. As Laverick says, reiterating the evolutionary nature of the exercise: "We started with what we knew at the time, we've learned, we've gotten better and we've adjusted the shape as we've gone forward. The worst thing you can do is build on quicksand; we're building on firm ground — the foundation is secure."