

U.S. Department of Agriculture

Information Builders is one of the largest independent software companies in the world. Our i-business technology solutions help you grow your business through the power of information.

U.S. Department of Agriculture Builds Modern E-Commerce System With Traditional Mainframe Tools

Snapshot

Organization

U.S. Department of Agriculture

The Challenge

To create an electronic bidding system that connects commodities suppliers to the USDA via the Internet

The Strategy

Leverage existing mainframe/COBOL expertise to create new Web-based applications

The Results

Domestic Electronic Bid Entry System (DEBES), a real-time, Web-based interface for vendors to create and submit bids. DEBES has led to a reduction in errors, increased bid security, quicker contract creation, reduced market exposure, lower prices, and more competitive buys.

Information Builders Solution
Web390



David Liem used the Internet and Information Builders technology to modernize the USDA's bidding system.

E-COMMERCE BUSINESS VENTURES ARE SOARING, THANKS TO A revolutionary new market model that connects buyers and sellers in real time. According to Forrester Research in Cambridge, MA, by 2001, 70 percent of businesses will be buying and selling products using Internet-based marketplaces. And by 2004, the marketplace will be handling \$2.7 trillion in goods and services.

Electronic marketplaces realize cost savings by eliminating process inefficiencies, streamlining manual data-entry activities, and reducing operating expenses. Companies set up electronic linkages to work more closely with their suppliers, and save millions of dollars in inventory and distribution

“With Web390, you can reuse your existing data access code, written in COBOL, PL1, or Assembler, to publish operational data directly on the Web.”

costs. It was precisely these efficiencies and economies of scale that motivated the United States Department of Agriculture (USDA) to create the Domestic Electronic Bid Entry System (DEBES) to simplify the ongoing bidding activities of its suppliers.

“DEBES has improved customer service both internally and externally,” says David Liem, project leader and technical lead for the DEBES project. “It has also encouraged more competitive pricing by enabling vendors to bid based on up-to-the-minute market prices.”

Nationwide Distribution

The Agriculture Marketing Service (AMS) and Farm Service Agency (FSA) of the USDA annually procure more than \$1.2 billion worth of food commodities. These goods are distributed through federal programs such as school lunches, supplements for Indian reservations, prisons, and the Women, Infants, and Children Supplemental Food Feeding program. The commodities include a variety of products, such as wheat flour, infant formula, processed meats, fruits, and vegetables.

Until recently, all processing was electronic with the exception of the solicitation and receipt of the bids. DEBES was developed to automate this final link in the process of soliciting and receiving bids for support of the domestic distribution of food assistance.

“DEBES is easily accessible via the Internet by over 200 vendors throughout the United States,” says Liem. “It completes the automation cycle by providing an electronic link between the USDA and commodity vendors, reducing the time required for generating contracts. DEBES also provides a standard bidding process for vendors that work for both the AMS and FSA domestic programs.”

Old Dog, New Tricks

B2B strategies allow businesses to leverage electronic alliances to speed the delivery of products and services to market. But what makes DEBES unique is not so much its e-commerce capabilities as the technologies used to create them: Most of the USDA developers who created the system are COBOL programmers, and all of the Web-based content is hosted in a native IBM OS/390 mainframe environment.

“Because we’re a mainframe shop, we have a lot of COBOL expertise,” Liem explains. “Our approach allows us to make the best use of

our existing staff and skill sets – predominantly people who are well-versed in mainframe technologies such as IDMS, COBOL, and the standard configuration management tools. They needed very little training in order to write this application.”

The USDA is not alone. Despite the advent of many new computing platforms and programming tools, mainframe COBOL applications still play a major role within large corporations and government agencies. In fact, many of these organizations have already made substantial new investments in their legacy COBOL assets as part of their Y2K remediation efforts.

Mainframe Meets Internet With Web390

DEBES is taking the USDA into the future of commerce with an innovative approach to electronic bidding. The technology that made it possible was Information Builders’ Web390, an HTTP/HTTPS server that transforms an IBM S/390 mainframe system into a World Wide Web application and data server.

“Web390 provides a secure gateway to existing mainframe applications, giving Web users immediate access to legacy applications.”

With this valuable tool, the agency was able to write Web server logic using the MVS COBOL language. Approximately 100 COBOL programs underlie the DEBES system. Data from the DEBES application is stored in a mainframe DB2 database, which is then fed into the legacy IDMS database.

“We have achieved full integration into the legacy invitation, creation, and bid evaluation system,” Liem notes. “Our developers can write CGI programs in traditional mainframe S/390 languages to accept and process input from Web browsers. With Web390, you can reuse your existing data access code, written in COBOL, PL1, or Assembler, to publish operational data directly on the Web.”

This capability is in sharp contrast to the majority of Internet servers that require CGI programs to be written and implemented in the UNIX or NT environments in languages such as Perl, C, or Java. Writing CGI programs can create a significant hurdle when trying to integrate these new programs with legacy data sources such as IDMS, VSAM, and DB2 – and when attempting to scale the application to thousands of users.

Web390 also offers instant browser access to any mainframe screen-based application, as well as the ability for designers to produce fully customized HTML screens supporting existing applications. The Web390 server supports all of the popular Web file formats, including HTML, VRML, GIF, and JPEG graphic files, as well as MPEG animation files – and, of course, JavaScript and Java applets. There is no need to implement UNIX or Windows NT services in order to host Web sites or grant Web access to mainframe applications and data.

“In our case, Web390 simplified the creation of JavaScript help screens, HTML drop-down boxes, and tabular input forms that conform to mainframe application logic,” says Liem. “Web390 provides a secure gateway to existing mainframe applications, giving Web users immediate access to legacy applications.”

DEBES in Action

Liem and his team created an online business process that closely resembles the original manual bidding process. This similarity facilitated user acceptance, since many of the vendors were already familiar with the process.

DEBES supports real-time access to bid information right up to bid opening time. Users have a choice of screen presentation modes and can customize the look and feel of the application to suit their specific tastes. They can also be given protected access to all data sets allocated in the mainframe S/390 environment. Internet

transactions are secured by Secure Socket Layer protocol, while the strength of the mainframe’s ACF2 security protects the DEBES applications and data files.

“Event-driven, point-and-click navigation simplifies the user interface, while preformatted reports enable vendors to print hard copies of their bids, if required,” says Liem. “JavaScript and CGI processing enable immediate validation of data as bids are entered.”

Here’s how it works. First, an AMS or FSA marketing specialist creates an invitation for bids. This text document is made available to the public via an FTP site.

Within DEBES, AMS or FSA users add comments to the offer form to clarify the request. They also create questions to gather information certifying that the various vendors can support their offers.

Vendors access the DEBES Web site to create their bids. Each bid is made up of three parts: certification questions, offer form with prices, and optional constraints that allow the vendor to limit its bid by supply location, delivery period, and product.

As each vendor completes a bid, it is submitted to the USDA for consideration. Vendors can modify their bids and resubmit them as needed, to reflect up-to-the-minute market fluctuations right up until the bids are opened by the USDA. If clarification is needed, an AMS or FSA user will contact the vendor and ask them to submit written approval for the change.

After the bids are reviewed, an AMS or FSA user sends them to the legacy system, where bid evaluation is performed and contracts are created.

Mainframe Redux

As computing as a whole makes a decisive shift from distributed, client/server architectures back to centralized applications and thin-client architectures, organizations are realizing that the mainframe is often the most powerful envi-

ronment available for hosting a Web server. Liem likes to summarize the advantages of developing Web applications on the mainframe. "We have combined the strength and security of a mainframe with the accessibility of the Internet," he says. "Best of all, DEBES leverages the existing knowledge of COBOL within our organization. We have direct access to the legacy data in IDMS, while still utilizing the modern SQL technology of DB2."

Why use COBOL for Web development? Liem is emphatic about the benefits here as well. "Mainframe COBOL has a long history as a secure environment that is highly optimized for centralized business processing," he says. "Web applications in this environment have a simplified architecture, no need for middleware, and can support non-SQL databases. You gain centralized configuration management and the ability to make use of your entire programming staff."

Data access is also simpler and more efficient, since DEBES runs on the same platform as the data it uses. And COBOL programmers tend to enjoy the new challenges.

Summarizing the Benefits

DEBES bridges the final gap in the USDA's procurement process by creating an electronic link between the release of the invitation to the vendors and the evaluation of the bids. "We have reduced manual contracting and eliminated manual data input by agency staff while creating a secure, electronic method for entering and receiving vendor bids," Liem sums up.

Other benefits of DEBES include a reduction in errors, increased bid security, and quicker contract creation, which serves to reduce a vendor's market exposure and subsequent risk, leading to lower prices and more competitive buys.

Find Out More

To find out how our i-business solutions can help your company succeed, talk to an Information Builders representative today. Contact your local Information Builders office, visit us at www.informationbuilders.com, or in the U.S. and Canada, call (800) 969-INFO.

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