Reusable Component Technology

5 To 10 Times More Productivity and

Responsiveness Potential For Web-To-Host Development

Introduction

Extending legacy mainframe applications through new e-business channels such as the Web, wireless devices or even new e-business applications has quickly become a major priority for almost every large business organization. By some estimates, at least 70% of the world's data resides on mainframes and most of it is likely to remain there. While that data represents a valuable asset, its value to an organization can be greatly enhanced if there is a highly effective way to gather, aggregate and manage it in today's fast-changing and complex e-business world.

Anyone who has attempted to use mainframe data with new Web tools or new analytical applications knows that obtaining useable information from raw data is a complex task. It requires much more than simply selecting the best delivery channel, the most attractive Web page or the most effective analysis package. The time and cost to access and control required data represent major hurdles in implementing new e-business technologies.

The cost to implement and integrate new technologies may be as much as five to ten or more times the cost of the software because of the complexity of integrating with other applications. Much of this complexity and the related cost arises because legacy systems were not developed with separate processing logic and presentation layers. Therefore, legacy applications may involve hundreds or thousands of hard-coded transactions and interfaces that were originally implemented just to support CRT delivery to a single user audience.

Today, organizations are implementing new e-business initiatives and systems must be developed to support entirely new groups of users who need access to the wealth of information maintained in legacy applications. As the demand for enterprise-wide data for the Internet, intranets, wireless devices and other channels increases, so will the

need to extend applications by aggregating data, providing new data and personalizing data.

Businesses cannot afford to implement these new initiatives by replicating the complex integration schemes of the past. However, the solution to this problem has been elusive because none of the current accessing approaches handles all of an organization's needs. So each new e-business technology requires a different accessing solution with additional implementation costs and compounded maintenance costs.

As more and more e-business solutions are implemented, adding additional layers of integration will become prohibitively expensive and unmanageable. To overcome this problem, a solution is needed which allows all legacy access to be handled by a single set of reusable components without affecting the legacy programs.

Gartner Group asserts that organizations that are not using component-based development (CBD) should be. Their outlook is that through 2005 IS organizations that are mature in CBD methods, with a large inventory of business components, have the potential to be five to ten times more productive and responsive than those that are not. For this reason, a new generation of technologies for CBD is required to accommodate rapid development and maintenance in a Web-to-host environment.

Computrol's ***eBASE*** software offers such a breakthrough in delivering S/390 data to new delivery channels. Using a sophisticated system of Reusable Components, cataloged parameters and templates, ***eBASE*** dramatically reduces the time required to deliver data to customers, business partners and employees. And it provides the security and flexibility needed in today's e-business world. This proprietary software solution has the capacity and functionality to become **the single pipeline** through which the vast majority of all transactions flow in an e-business environment.

This component-based technology provides a reusable approach to separating the presentation layer from the processing logic for legacy applications. This technology allows all access to legacy data to be controlled through one central location and one set of code. Reusable Component technology uniquely addresses a broad range of business needs without the pitfalls associated with today's other options.

Today's Options

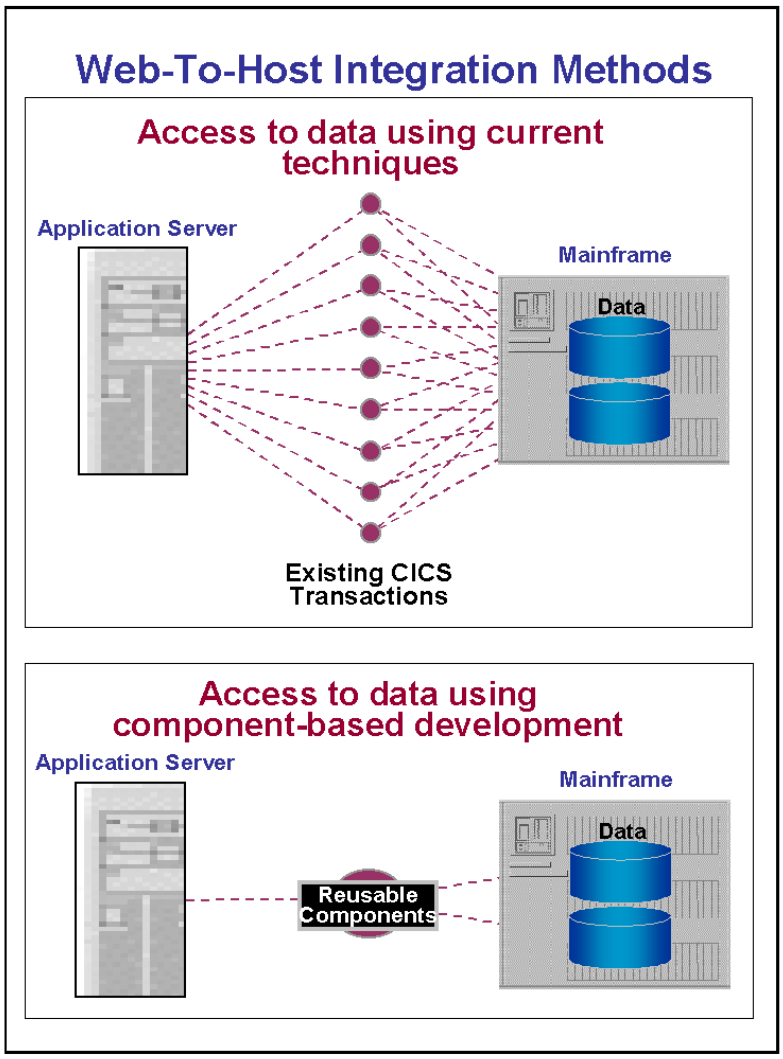
Mainframes survive because they securely and reliably manage data in highly complicated environments - but they can be controlled only through mainframe programs. Because of this complexity, one approach to accessing mainframe data through new channels has been to download it to a separate server database. With "point and click" GUI development, data can be manipulated on the server for presentation purposes - but this ease of development comes at the major expense of lost access to real-time, integrated data. Once data is separated from its original source, it cannot be kept current. And since only selected data elements can be effectively downloaded to a server, this approach soon becomes unwieldy and therefore useful only in limited situations.

Current options for using data directly from the mainframe - where it remains complete, current and integrated with other files - rely either on existing mainframe transaction processing or on newly created transactions. Technologies such as "screen scrapers," emulators, reusable Application Programming Interfaces (API) and new code generation are all being tried in an effort to access valuable data stored on the mainframe. Yet, while each of these alternatives has some benefits, each also has major disadvantages and therefore is usable only in limited situations.

The use of existing legacy transactions to connect to mainframe data has the benefit of retaining proven and reliable legacy processing. But it also clearly highlights a recurring problem in mainframe development - responding to change is unacceptably complex and time-consuming. Changes necessary to respond to new e-business initiatives require the same changing, testing and compiling of mainframe programs which frustrate many users in today's mainframe environment. For highly static applications where change is not expected, relying on screen scrapers, emulators and even reusable API's may be adequate.

Web-To-Host Integration Methods: Comparative Analysis				
Feature, Function or Performance Attribute	Using Reusable Components	Replicating Data On Server	Using Existing Transactions (1)	Creating New Transactions (2)
Accesses data real time	Yes	No	Yes	Yes
Uses a single method for enterprise-wide data access	Yes	No	No	No
Requires no mainframe programming to develop new transactions	Yes	No	No	No
Accesses data from multiple databases without additional programming	Yes	No	No	No
Transfers only required data	Yes	No	No	Yes
Handles changes in data requirements with “point and click” process	Yes	No	No	No
Permits reuse of existing business rules and logic	Yes	No	Yes	No
Provides multiple format selections for output	Yes	Yes	No	No
Incorporates new personalization, search and reporting without programming	Yes	No	No	No
(1) Includes screen scrapers, emulators or other solutions using existing online transactions.				
(2) Includes code generators, packaged API’s or other solutions using new code.				

But if business changes are anticipated, the problems associated with changing mainframe applications are magnified. This problem is further exasperated because knowledge of the legacy applications is vanishing along with the pool of technicians with the skill sets necessary to make changes.



Finally, the creation of newly-coded mainframe transactions or API's has the benefit of providing Web developers with the exact data required for Web presentation and in the required format to satisfy the organization's current e-business requirements. But even this approach has major restrictions when future changes may be required. And the typical three to six-month development cycle to modify existing mainframe transactions or code new transactions is not acceptable in today's fast changing e-business environment.

Computrol Reusable Component Technology

The Next Generation - Reusable Components

Reusable Component technology is quickly being recognized by the market as the next generation of mainframe data accessing and extension technology. This technology brings modular, object-oriented, parameterized concepts to mainframe development and extension.

Reusable Component technology on the mainframe provides a flexible, secure and reliable rapid development capability for extending legacy applications to new channels such as the Web. And rather than providing a single solution for specific problems, Reusable Component technology provides a true legacy extension "strategy" because it allows the use of a single set of common functions which are used across all mainframe applications and to all delivery channels.

Reusable Components in Legacy Application Extension

Reusable Components are a highly integrated set of on-demand functions to read and write against mainframe databases or other files from an external PC working with the control functions of an On-Line Transaction Processor (OLTP) such as IBM's CICS. Security, personalization, report generation and delivery, audit trails, real time or memo posting and data integrity features are just some of the additional Reusable Components which are available on-demand.

Reusable Component technology is not "cut and paste" reuse of existing mainframe code. Reusable Components are componentized processing modules which isolate processing and data elements in much the same manner that PC spreadsheet software isolates reusable functionality from data. The Reusable Component structure is a Web-to-host solution which retains data control and integrity on the mainframe while offering the ease of PC-based GUI "point and click" assembly of new, fully-tested on-line transactions. And these transactions can be created in a matter of days or even hours rather than months.

Reusable Component technology allows extension of legacy applications to the Web with only ASP or JSP developers and minimal mainframe knowledge. Reusable Component technology reuses not only its fully-tested and reliable core components but also permits existing business rules and logic and existing transactions to be used where appropriate. Thus the Reusable Component technology brings together the benefits of all of the current alternative technologies in a single approach which can be used as the overall strategy for enterprise-wide extension of all legacy applications.

Computrol Reusable Component Technology

Reusable Component technology offers any organization:

- The speed and ease of "point and click" Web-browser development and maintenance using mainframe data
- The reliability of fully-tested, proven mainframe components
- The benefits of transactions designed to handle only the requirements of specific Web browser pages or other new delivery channels
- The ability to add and change transactions without mainframe coding but with complete mainframe control and security
- The capability to aggregate data from multiple applications, regions or platforms
- The benefit of maintaining only one set of programs and cataloged transaction parameters rather than hundreds or thousands of hard-coded transactions or program interfaces which are typical in a large organization

Reusable Component Technology

The Reusable Component technology includes several core components:

- An interactive data dictionary that provides a real-time cross-reference table to identify and define all of the data elements in the legacy application data files and, working in connection with a common API, to make all data in the database immediately available for use
- An interactive environment dictionary to define the way individual files are related so that data from multiple databases can be logically combined and even cross multiple applications
- A common API which uses the interactive data dictionary to retrieve requested data so that programs do not read application files except through the API
- A repository of groups of user selected data that have been assigned a unique ID and processing function and are grouped and placed permanently in storage for use when required

- A suite of subroutines to perform functions such as "read," "add," "update" or "delete," to provide control and data integrity functions and to perform other business functions such as personalization, security, reporting, auditing and search capabilities

In a Reusable Component environment, components are managed through mainframe programs which are invoked through external components installed on a workstation or middle-tier server. Through the application development environment, logical "interactive connectors" (the user selected groups of data that have been assigned a unique ID and processing function) can be created and cataloged in a repository by "point and click" selection of individual data elements from any mainframe file identified to the interactive data dictionary. The attributes assigned to each interactive connector then control the data that can be accessed and the functions that can be performed (add, change, update, etc.)

When the designated interactive connector is ready to be executed, the Reusable Component control programs compose an OLTP transaction by combining the selected data elements with the reusable function. The subroutines identified in the data dictionary and associated with the function are then called. Reusable Component technology thus completely separates the data from the subroutines so that changes in data files or data requirements can be accomplished by simply changing the data dictionary or the cataloged interactive connector. Once the interactive connector has been executed on the mainframe the results are returned to the external user for display, typically in an ASP or JSP programming environment.

Reusable Component technology optionally permits existing OLTP transactions to be called to take advantage of existing business rules and logic where appropriate or allows existing logic to be "wrappered" and called as part of OLTP transactions.

Benefits of Reusable Components

The principal benefits of the Reusable Component technology are its speed and ease of use and its universal applicability within a mainframe environment. A single Reusable Component platform can be used as an enterprise-wide strategy for handling mainframe data for any delivery channel.

The technology helps create an overall strategy because once a data file is defined to the data dictionary it is usable anywhere in any delivery channel without mainframe programming. Reusable Components eliminate the need for time-consuming

development of new transactions and maintenance of existing transactions to access legacy data. Changes can be implemented in a matter of minutes and personalization of the presentation for display or reporting is unlimited.

Data is deliverable to any server in any format including COM/DCOM, Java or EJB and is deliverable in compliance with CORBA standards. Data can also be delivered in formats for common spreadsheet, database and other PC applications. Basic Web delivery requires only JSP or ASP pages and no mainframe programming. Extended functionality, expanded reporting capabilities, multiple application integration and additional data elements can be rapidly added to legacy applications without extensive coding.

Reusable Component Technology in Use

Reusable Component technology provides not only a strategy for enterprise-wide Web access but also a strategy for expanding to other delivery channels.

A major Canadian bank used Reusable Components to connect its platform screens and data transmission to its mainframe applications. The bank also used the same Reusable Components to communicate between its mainframe database and its interactive voice response system.

The technology also allowed the bank to consolidate information for all mutual fund shareholders and transmit the summary data in spreadsheet format to fund managers. It further permitted fund managers to enter prices, dividends and payment instructions from their local PC's.

A major credit card company used Reusable Components to add Web-browser access to one of its primary applications. The company can now replace its outdated paper-based reports with Web delivery. This delivery includes Web pages with drill down to underlying data, data transfer to spreadsheets or PC databases and ‘ftp' type print display.

A large U.S. bank used Reusable Components to connect a presentation layer emulating the platform system screens of a major acquired bank with the acquiror's application processor on the mainframe. The acquired bank's personnel use screens which look and behave exactly like previous platform screens to perform all required business functions. But several thousand new personnel did not require retraining as the system looks exactly the same. This bank also used the same Reusable

Components to create pages on its Internet banking system and connect them to the mainframe application.

A Reusable Component solution is a complete solution and fits seamlessly into any mainframe Web extension and enhancement environment.

About the Authors

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