



Turning Financial Mainframe Applications into SOA Building Blocks

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Turning Financial Mainframe Applications into SOA Building Blocks

As organizations strive to get more mileage out of their IT resources, they've found that the most significant gains come from the reuse of programs. And the best way to reuse programs is by implementing a service-oriented architecture.

Although SOA has been both over- and underestimated, more organizations are starting to realize its actual potential. In fact, a well-implemented SOA can result in business agility, shorter time to market, improved customer service, and more economical execution of business initiatives.

The building blocks of SOA are services, which are available through well-defined and standardized interfaces such as a web services interface. Almost all of today's packaged applications provide a web services interface, so they can participate in SOA.

Financial Service Applications: Not Built for SOA

Most financial service organizations rely on mainframes for high-volume, high-availability transaction processing. Financial transactions worldwide are processed by IBM mainframes running CICS (Customer Information Control System) applications, and insurance companies continue to rely on tailor-made, COBOL-written IBM mainframe applications to support their mission-critical business processes.

All these mainframe-based financial applications have one thing in common: They do not support an interface to allow service-enablement of their business functionality. That means that financial applications, taken as a whole, present the biggest hurdle to SOA implementations.

This white paper discusses the benefits and challenges of implementing SOA in financial service organizations such as banks or insurance companies. After exploring the characteristics of mainframe-based financial applications, you'll learn various approaches for service-enabling these applications. This information can help you make informed decisions about turning your legacy financial applications into SOA assets.

The Value of SOA

SOA is an industry model that defines an application's functionality as a set of reusable services that can be published over a network and accessed by any authorized system. When legacy applications are able to interoperate in an SOA, they can be easily combined to perform new tasks. And the services can be used as building blocks for new composite applications.

The resulting architecture is recomposable, rebuildable, and reusable. What's more, it does not take a lot of effort to accomplish. Because of its malleability, an SOA allows you to continuously keep your IT systems aligned with your business practices.

The value of implementing SOA can be broken down into two major categories: cost-saving benefits and revenue-generating benefits. Cost savings apply to the IT organization and are typically realized in these areas:

- **Development** – Productivity improvements, shorter test cycles as a result of modularity, increased reuse, and quicker builds.
- **Maintenance and support** – Simplified modifications, standard-based access, and architectural partitioning.
- **Operations** – Automation of repetitive manual processes.

More important perhaps than the IT cost savings are the revenue-generation benefits that apply exclusively to the business. Here are some examples:

- **Business agility** – Faster development of new applications and greater adaptability of existing applications to meet changing business requirements.
- **Extended value chain** – SOA-based modularity, web services standards, Internet as a transport network. Result? New ability to extend internally focused applications outside the firewall.
- **Increased market share** – Driven by improved process agility, visibility, and value-chain extension.

- **Improved service** – Including customer self-service, by extending internal functions via standard web browser. (Multi-channel access results in improved cross-sell and up-sell capabilities, too.)

To maximize the above benefits, pursuit of an SOA strategy must include service-enablement of the applications in use today, rather than limiting SOA efforts to new application development.

The Mainframe: Still King in the Financial Service industry

Because financial service institutions were early users of computing, it comes as no surprise that their systems are old – on average, *15 to 20* years old. But despite their age, mainframe systems continue to serve as the industry's technology foundation.

More financial transactions are processed by IBM CICS than any other transaction-processing product. Here are some salient statistics:

- CICS handles more than 30 billion transactions per day.
- CICS processes more than \$1 trillion in transactions daily.
- CICS supports more than 900,000 concurrent users.

IMS (Information Management System) is another transaction-processing system from IBM. More than 90 percent of the Fortune 1000 companies (including many financial service companies) are using IMS.

Apart from high-performance and high-availability transaction processing, mainframe applications continue to dominate the financial service industry for yet another reason: Few packaged applications can adequately replace the tailor-made financial service applications. Policy-administration and claims-processing applications are good examples of the oldest systems in the insurance industry. Most insurers have tried to find packaged replacements, but none can measure up to these core industry applications.

So financial service organizations are left in a quandary: While they must move to SOA – ASAP – mainframe-based applications by default don't play very well in SOA. Whether the financial service systems are CICS-based, IMS-based, or COBOL-

written green-screen applications, they all share the same deficiency mentioned above: a well-defined interface that can make discrete business functions available as reusable services. Consequently, mainframe-based financial applications are often considered a roadblock, rather than an asset, to implementing SOA.

Service-Enabling Financial Applications

Considering these obstacles, is it possible to transform your tailor-made legacy applications into SOA assets? Are there options for turning valuable financial functionality – now locked up in your mainframe systems – into services that can be used to build your SOA?

The good news is, it can be done. And you can do it without disturbing your mission-critical applications. But first you need to carefully examine how your financial applications are structured. That will help you determine the right approach and supporting tools for service-enablement.

Caveat: Not all financial service applications are designed the same way. In general, mainframe-based financial applications can be categorized into four major groups:

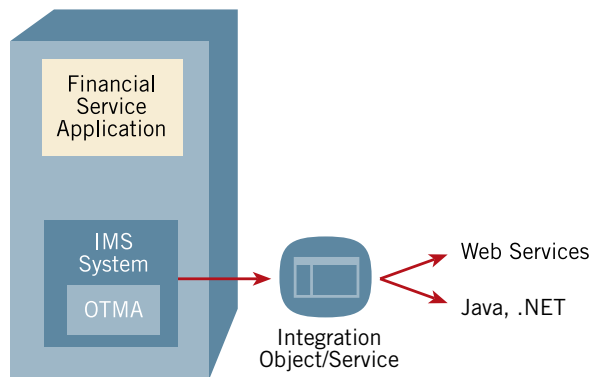
- IMS applications, using the IMS Transaction Manager.
- CICS applications, based on the CICS Transaction Server.
- 3270 applications that do not use IMS or CICS transaction platforms.
- Applications that run on platforms other than IBM mainframes; e.g., UNIX, iSeries (AS/400), HP e3000, and OpenVMS platforms.

Let's look at these categories individually.

IMS-based applications

The most demanding banking and insurance systems are often built on IMS because of its high performance and scalable foundation. These applications are usually developed using third-generation programming languages like COBOL.

Depending on the business processes they support, IMS-based applications might not include presentation logic to communicate with end users through a 3270 interface. From a service-enablement



A financial services IMS-based application can be service-enabled through the use of a transaction integration tool working directly through OTMA.

perspective, this is of little importance because the presentation logic is written as a separate macro routine executed by a separate subsystem (the Message Formatting Service) of IMS.

The preferred way of service-enabling IMS applications is by using a transaction integration tool that works directly through Open Transaction Manager Access (OTMA). In this way, financial transactions can be captured as standard interfaces – including J2EE, .NET, and web service interfaces – for reuse in SOAs. This direct encapsulation of transactions offers high performance without disturbing valuable code or associated financial processes.

CICS-based applications

CICS is the most widely used processing system in the world for financial transactions. CICS applications are typically written in COBOL, PL/1, or Assembly language. CICS applications can run as services that do not include presentation logic, but are initiated through batch commands or used real-time by other applications.

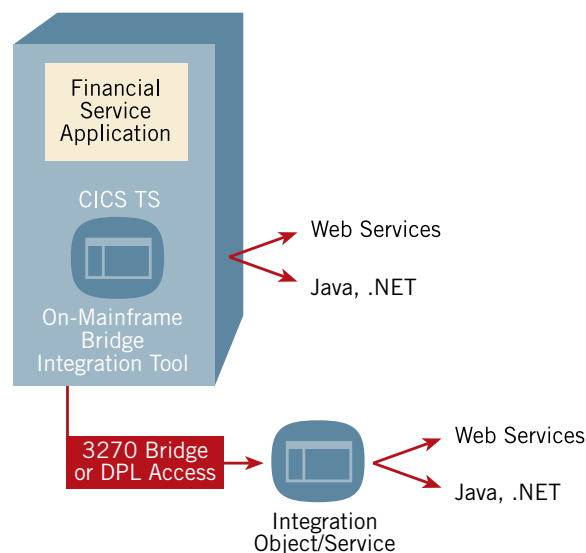
When looking for the best approach to service-enable your CICS-based financial applications, you should first answer these questions:

- Does your application include presentation logic with a 3270 screen interface?
- Do you want service-enabling tools to run on the mainframe or on a middleware platform that accesses the mainframe?

On-mainframe approach

The preferred way to service-enable CICS financial applications with a 3270 screen interface is by using a native adapter that runs inside the CICS Transaction Server on the mainframe. This type of adapter is frequently referred to as a bridge-integration tool (or a 3270 bridge). When the tool is mainframe-resident, you get a high-performance solution for reusing host data and business processes from CICS applications, without having to change any financial application code.

To use bridge-integration tools, you must have access to your mainframe system and be allowed to install software on it. In situations where an IT environment is outsourced, or an organization does not own the financial applications (lease, rental, application platform service, e.g.), you might need to consider other options.



Service-enablement of CICS financial applications can be done using an on-mainframe or off-mainframe approach.

Off-mainframe approach

In situations where you cannot install a bridge-integration tool within the CICS Transaction Server, you can use an off-mainframe approach. CICS transactions can be transformed into services using a transaction integration tool. The optimal off-mainframe transaction integration tool accesses the financial transaction business logic through the COMMAREA via Distributed Program Link (DPL). That way, you can harvest CICS transactions directly, without going through any presentation logic or terminal I/O.

Keep in mind that your financial CICS transactions must offer direct COMMAREA access to use this method. When direct COMMAREA access is not supported, valid options include the bridge-integration tool mentioned above or integration through the 3270 screen interface.

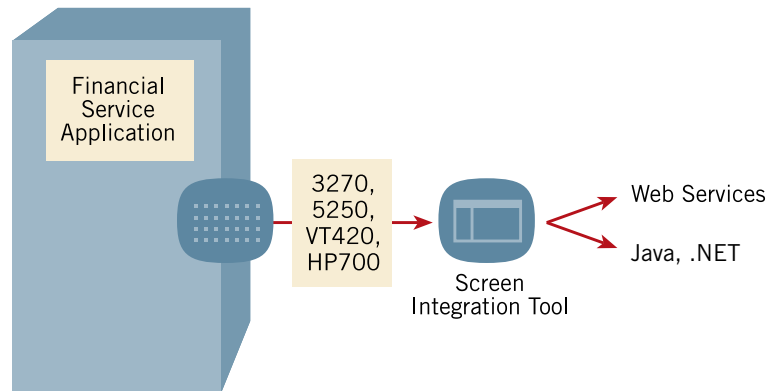
3270 applications

3270 applications can comprise any that include presentation logic with a 3270 screen interface. Financial 3270 applications are often based on an IMS or CICS transaction system. When that is the case, the best method for service-enablement is through the transaction layer – using a CICS Bridge integration tool or a transaction integration tool, as described above. This approach can help maintain the high performance and availability of your financial application.

Due to any number of factors, however, you might not be able to integrate your applications at the transaction level. Here are some typical disqualifying factors:

- The application is not using a CICS or IMS transaction system.
- A bridge integration tool cannot be installed on the mainframe.
- The CICS application does not support an ECI interface.

In many of these situations, access through the terminal screen is the most practical choice. Using the right screen integration tool, developers can encapsulate any data and logic needed to service-enable your financial applications.



Service-enablement via the terminal screen can be the best option for both mainframe applications and those running on various server platforms.

A screen-based approach comes with a fundamental advantage: It works with every application that has a 3270 screen interface. Regardless of whether your application is on the IMS or CICS platform, 3270 screen-based access is a straightforward path to service enablement.

Non-mainframe-based financial applications

Although a large percentage of financial service applications still run on the mainframe, many run on different server platforms including IBM iSeries (AS/400), UNIX, OpenVMS, HP e3000, Linux, and others. In medium-sized financial service organizations, UNIX and AS/400 platforms are particularly prevalent.

To service-enable the functionality locked in financial applications on these platforms, there is typically only one option: the screen interface. Because these applications are not usually based on CICS or IMS transaction platforms, the sole point of access is likely to be the VT420 (UNIX, Linux, HP OpenVMS), 5250 (IBM iSeries, AS/400), or HP700 (HP e3000) interface.

The approach to integrating these applications via the screen interface is no different from integrating financial applications via the 3270 screen interface. A screen integration tool that supports VT420, for example, is used to service-enable the UNIX- or OpenVMS-based application.

Keep in mind that VT-based applications like those running on UNIX and OpenVMS platforms are by nature not easy to integrate via the screen interface. Unlike the IBM 3270 and IBM 5250 terminal interface, where communication occurs by sending complete screens (block-mode), VT applications echo every single character back and forth

(character mode). That can make the integration of VT-based applications especially challenging.

When choosing a screen-based integration tool for your financial service applications, make sure it not only supports VT420, but also is optimized for service-enabling these applications. In fact, you might ask for references that prove it can perform character-based integration.

SOA in Financial Service Organizations: It Can – and Should – be Done

Mainframe-based financial service applications should by no means be considered obstacles to SOA. In fact, they should be seen as valuable assets for implementing SOA. Using the right set of integration tools, you can unlock the data and business logic in your financial applications and make them available as reusable services – the building blocks of SOA.

Depending on a financial application's structure, transaction system, and host platform, integration tools are available for service-enablement at the IMS transaction layer, CICS transaction layer, 3270 CICS layer, 3270 screen interface layer, or (in the case of non-mainframe platforms) the VT420, 5250, HP700, and other terminal interface layers.

The Verastream Product Line

If SOA is the best way for your financial services organization to stay competitive, but your legacy applications have been holding you back, you can look to the Attachmate® Verastream® product line. Verastream can transform your legacy financial service applications into SOA assets by exposing business processes as reusable web services, XML, JavaBeans, and .NET components.

Verastream-generated services can be mixed, matched, and reused selectively to extend financial service functionality to new composite applications or SOA. No code changes to your legacy financial applications are required. That means you avoid risk while speeding up SOA implementation, application development, and workflow enhancement. Financial service organizations might be interested in these specific options:

- **CICS 3270 Bridge Integration - Verastream Bridge Integrator** is a native, mainframe-resident adapter that provides rapid, high-performance integration of CICS applications. CICS interaction is enabled through the IBM Link3270 Bridge in any format required by the corresponding CICS application.

For service-enabling CICS-based applications in financial service environments where you can install software on your mainframe, Verastream Bridge Integrator is the ideal tool. It runs inside the CICS Transaction Server and leverages the power of the mainframe.

- **Transaction-Level Integration - Verastream Transaction Integrator** you can combine data and logic from existing programs developed for the IMS and CICS environments. The versatile client/server implementation includes a graphical design tool and web-based centralized management.

For service-enabling IMS applications in financial service environments, Verastream Transaction Integrator is the ideal tool. It works directly through OTMA. Verastream Transaction Integrator is also the ideal tool for service-enabling CICS applications in financial service environments where you cannot install software on the mainframe. It directly accesses the financial-transaction business logic through the COMMAREA.

- **Screen Integration - Verastream Host Integrator** Whether your environment is IBM zSeries (S/390), IBM iSeries (AS/400), UNIX, OpenVMS, or HP e3000, you can use Verastream Host Integrator to transform your legacy applications into reusable services for building composite applications.

For accessing financial service applications via the screen interface, Verastream Host Integrator is the ideal tool. It lets you create services or components (e.g., COM, .NET, Java, or web services) that can be mixed, matched, and reused in today's SOA. And unlike other solutions, Verastream Host Integrator supports character-based applications.

About Attachmate

Attachmate delivers advanced software for terminal emulation, application integration, and secure communications. Our NetIQ business provides solutions for automating IT processes and managing performance, security, and compliance of distributed IT. With our technologies, more than 65,000 businesses worldwide are putting their IT assets to work in new and meaningful ways.

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