

## Modernizing Mainframe Applications in Supply-Chain Environments

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## Types of Supply Chain-Intensive Companies



Retail



High Technology



Consumer Goods



Health Care



Automotive



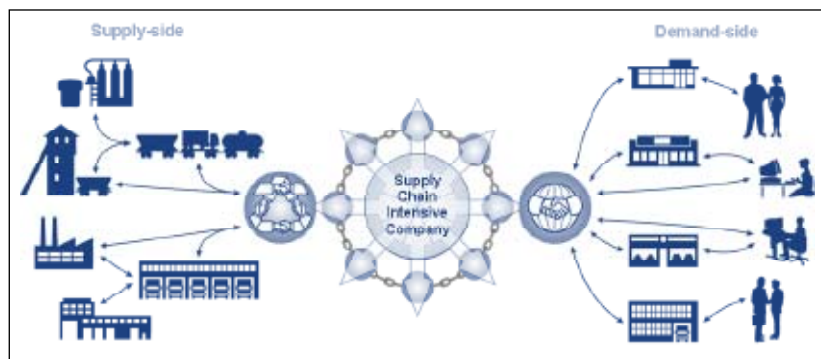
Government

Mainframe solutions built and modified over many years have been the core engine for many of the world's largest supply chain-intensive companies. These solutions contain innovative business processes that can competitively differentiate a company and fuel its industry leadership. But the value of these legacy systems can be compromised by the excessive time it takes to modify them. The result, from a corporate perspective, is impaired strategic agility.

New technologies make it possible to expose legacy-rich code and data to a more dynamic enterprise architecture. This white paper explores the challenges and benefits of extending mainframe functionality in supply chain-intensive environments.

### What Is a Supply Chain-Intensive Company?

Supply chain-intensive companies are defined by their high transaction volumes and the complexity of their multi-tier relationships with customers, suppliers, and partners. They exist across multiple industries including retail, high tech, automotive, consumer goods, health care, and government. They also exist in multiple roles within these industries, from basic commodity producers, component manufacturers, final product manufacturers, distributors, retailers, and on to post-sales service.



Supply Chain-Intensive Company Process Flow

Supply chain-intensive companies operate within the context of myriad forces shaping the opportunities and threats in their environment. To succeed, an organization must be able to respond more quickly and more effectively than competitors. Whether a given strategy is growth-oriented, customer-focused, supplier-focused, or innovation-intensive, success is defined by the strategic agility to out-think and out-execute competitors.

**External Forces of Change**

- Customer Preferences
- Investor Expectations
- Competition
- Government Regulations
- Product/Service Innovation
- Economic Conditions

**Powerhouse Mainframe Applications**

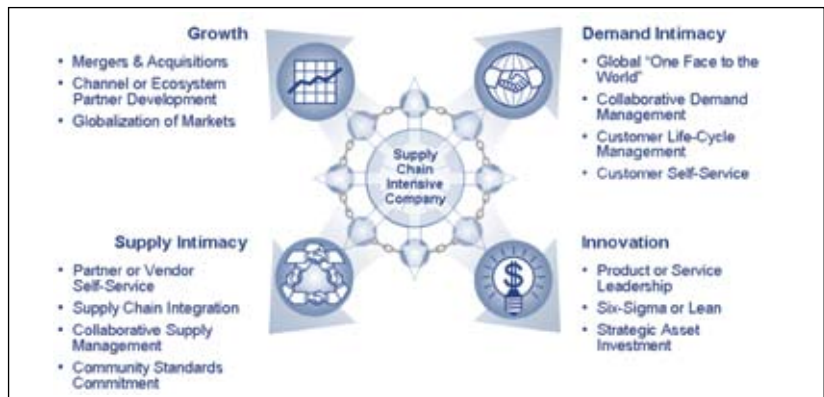
These complex and highly integrated mainframe solutions are becoming the barrier to an organization’s strategic agility.

**COBOL Skills Shortage**

In 7 to10 years, many COBOL programmers will be retiring. They’ll take all the undocumented knowledge of these powerhouse mainframe solutions with them.

**Strategic Agility**

The capability to sense, decide, and execute more effectively than the competition.



Common Strategic Responses to Forces

**Powerhouse Mainframe Applications**

Many industry-leading supply chain-intensive companies use mainframe applications to manage both the complexity of their operations and the high volume of their transactions. But proprietary applications are having increased difficulty keeping pace with the forces shaping their industries. And legacy applications have become the limiting bottleneck to strategic agility because they take too long to unlock and reuse.

In addition, CIOs are watching the mainframe-oriented workforce move closer to retirement. This set of retiring workers will be taking with them their mainframe platform and COBOL skills, plus the knowledge of their homegrown solutions, many of which have been poorly documented. Younger workers no longer strive to acquire mainframe or COBOL skills. These trends all point to an impending skills shortage.

Modernize	Replace
Preserve competitive best practice advantage	Integrated standard best practices
Lower investment and requires ongoing support costs	Replacing all components means extensive change management
Lower risk of business distraction	High risk of business distraction during transition
Reduced change management	High initial investment and ongoing maintenance costs
Reduced training costs	Need new IT skills
Improved IT agility	
Increased availability of skilled IT resources	

Legacy System Modernization vs. Replacement

When it comes to existing legacy solutions, CIOs and their executive partners are faced with a difficult decision: In essence, it’s modernize vs. replace. If they choose modernization, the mainframe application can be enabled as a component in an updated enterprise architecture. This method speeds functionality development and integration with other solutions in the application portfolio, without necessarily changing mainframe code. If they choose replacement, an industry-specific enterprise solution is typically used to achieve corporate and IT goals. The core differences between the two options involve the costs, risks, and time required to achieve strategic agility.

## Modernize or Replace?

	Modernize	Replace
<b>Competitive Advantage</b>	<ul style="list-style-type: none"> <li>A key source of a company's competitive advantage may be its innovative business processes implemented in a custom mainframe solution.</li> <li>These processes are usually unavailable in replacement solutions.</li> <li>To increase competitive advantage, extend the existing application by integrating with other applications and trading partners.</li> </ul>	<ul style="list-style-type: none"> <li>Commercially available enterprise solutions contain integrated best practices across a suite of application components.</li> <li>Widely available solutions create only marginal opportunity for competitive advantage (achieved through creatively configuring the solution).</li> </ul>
<b>Investment</b>	<ul style="list-style-type: none"> <li>An integration capability is added, but otherwise nothing is changed. This is a non-invasive approach.</li> <li>Business process reengineering is enabled by the new architecture and can be limited to areas of prioritized focus.</li> <li>The cost of extending the life of the existing application is a fraction of the application replacement cost. (Costs are mostly professional services).</li> <li>Required integration software is a minor expense compared to enterprise-solution expenses.</li> </ul>	<ul style="list-style-type: none"> <li>Existing applications are replaced by enterprise solutions that require many components of the application suite to be installed and configured concurrently.</li> <li>Business process reengineering requires significant time and cost beyond the installation and configuration effort.</li> <li>If business process reengineering is bypassed to save time, many of the core benefits of the solution are lost.</li> <li>The cost of these comprehensive enterprise solutions, plus implementation, is three to ten times that of a typical modernization investment.</li> </ul>
<b>Ongoing Costs</b>	<ul style="list-style-type: none"> <li>Maintenance fees are required for the host integration software.</li> <li>The modernization approach using host integration software can reduce (or eliminate) the need for host emulation software. As a result, maintenance fees may no longer be necessary for some existing host emulation tools.</li> <li>Host integration products produce reusable services. That means future initiatives to extend the legacy application will take less time and technical resources because of reusability of work already done.</li> </ul>	<ul style="list-style-type: none"> <li>Maintenance fees are required on all enterprise application components, including those that are not (yet) fully supporting your business.</li> <li>New version releases may not be adequate to support your business and will require additional implementation and customization investments when installed.</li> <li>Support for application components not upgraded will be withdrawn eventually, so you have to implement – and customize – new components on a regular basis.</li> </ul>
<b>Business Risks</b>	<ul style="list-style-type: none"> <li>The existing application is changed only if a business process is improved, limiting business risk.</li> <li>Timing for the modernization initiatives can be scheduled to fit the ability of business resources to support the work.</li> </ul>	<ul style="list-style-type: none"> <li>The effort displaces other initiatives, impeding short-term business goals.</li> <li>Any functionality beyond that offered by the enterprise application suite requires an integration capability similar to modernization or custom code that can limit your ability to take upgrades.</li> <li>Installation and configuration requires greater effort from key staff than modernization effort (due to all of the processes being changed).</li> </ul>
<b>Technical Risks</b>	<ul style="list-style-type: none"> <li>Leverages proven application development platforms (e.g., Microsoft .NET or J2EE) and proven host integration technologies (e.g., Attachmate Verastream).</li> <li>Architectural skills are required to ensure high performance.</li> <li>New IT skills are limited to the host integration tool.</li> </ul>	<ul style="list-style-type: none"> <li>Many popular enterprise solutions have enough implementation and integration experience that the technical risks are low.</li> <li>Many have a record of high performance.</li> <li>IT skill sets need to be upgraded or changed out. For example, in-depth enterprise application administration skills will be needed while COBOL programming skills become redundant.</li> </ul>
<b>Change Management</b>	<ul style="list-style-type: none"> <li>Only the few modernized business processes need change-management attention.</li> <li>Many solutions result in reduced process complexity and familiar user interfaces, speeding time to proficiency.</li> </ul>	<ul style="list-style-type: none"> <li>A major change-management effort is required when implementing (due to the many business process changes).</li> <li>Future upgrades also require significant change-management support.</li> <li>Deployment phases are long and the time to proficiency is slow, due to complexity.</li> </ul>

**Mainframe Application Modernization and Mainframe Platform Migration**

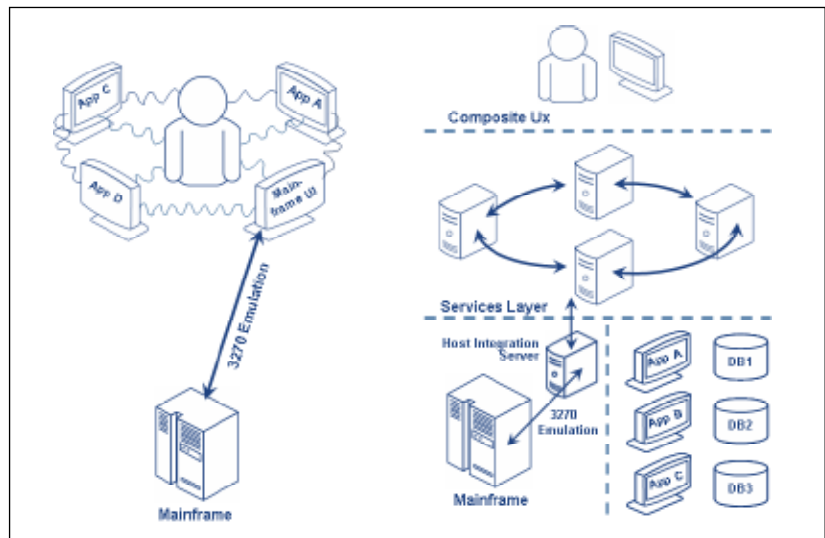
Once a decision is made to modernize a legacy application, companies need to consider if and when they will migrate off the mainframe platform. Strategic agility can be achieved without migrating off of the mainframe or in parallel to migrating off the mainframe. The decision to migrate is primarily driven by the size of the mainframe hardware required to get the performance needed, the anticipated costs of hardware alternatives, and the investment required to change platforms. While the migration decision does not impact the potential for strategic agility, the decision will shape the alternative architectural approaches that can be used to achieve it.

**Mainframe Application Modernization and Functionality Migration**

Many companies move portions of functionality off mainframe application for different reasons. Financials are the most common components moved as large organizations with multiple divisions seek to standardize on one financial application. During this process a migrated component of functionality is required to be integrated back into the core application to accommodate its use by other components. A modernized architecture streamlines this process and helps ensure its success.

**What is Mainframe Application Modernization?**

Modernization, in its simplest form, involves leveraging a mainframe application as a component of a multi-tier enterprise architecture. Additional architectural tiers frequently include a process-driven and independent user-interface tier, a services tier that integrates both logic and data, and an application logic and data tier. This multi-tier approach is contrasted with the current mainframe structure that provides the user interface, logic, and data all within one integrated structure. Tight mainframe integration is a strength when it comes to delivering high-performance transaction processing but makes changing the applications more difficult. A core challenge in modernization is to increase the flexibility for changing the application without compromising performance. That's why working with an experienced architect is critical to the success of a modernization effort.



Mainframe Application Modernization

**Delivering Strategic Agility Through Business Value**

The modernization process delivers an extensible architecture through the execution of a roadmap of IT-enabled business initiatives. The IT strategy shapes the tiered architectural design but the strategic goals of the organization drive the modernization roadmap to deliver value and strategic agility together.

Within the scope of a typical roadmap most legacy modernization programs enhance strategic agility by upgrading technical capacity. Whether it's adding a new user interface to reduce training costs or adding business intelligence to augment decision making, the extensible architecture creates new opportunities for leveraging legacy mainframe logic and data.

Common IT competency-improvement efforts included in modernization programs are addressed below.

## Best Practices

### Choose an Effective Modernization Champion

A modernization champion is an internal advocate positioned to ensure strategic alignment across the CEO, CIO, and COO. This person is not the sponsor or project manager but a trusted leader who shapes the vision of strategic agility that modernization must deliver. The champion also follows through to ensure the delivery disciplines are effective. Most champions are senior-level people with cross-functional credibility and the drive to achieve results.

### Select an Experienced Modernization Architect

The modernization architect plays a key role in linking the vision of modernization with the reality of the existing environment to determine what is possible and what is pragmatic. While there are many ways to deliver a modernized environment, the challenges are complex and always operate within constraints of time, money, and the ability of the organization to effect change. The need for deep experience in this critical role usually drives organizations to seek an external resource that specializes in legacy modernization. Internal IT staffs challenged with this mission-critical task can experience a steep and frequently painful learning curve.

### Develop a Prototype of the Modernized Application

Modernization of a legacy application will mean different things to people in different roles. Creating a functional prototype of the modernized legacy application can help to establish realistic expectations of the modernization vision. The prototype should help people understand the key architectural concepts that produce strategic agility by demonstrating how existing architectural barriers are overcome. It should also highlight how business value drives modernization program investment. The limited effort it takes to create a prototype/visualization pays off in the energy that gets brought to the modernization program.

### Employ a Technical Proof of Concept to Test the Architecture

The process of developing a modernized architecture is complex and subject to various types of constraints. That's why a technical proof of concept is useful to test key architectural design features. The proof of concept should implement a small but non-trivial fragment of business process functionality and integrate all participating components completely, using a narrow but top-to-bottom slice of the enterprise architecture.

This process will validate design assumptions or point to the need for design modifications. A technical proof of concept is done very early in a modernization program so the guidance given to developers can produce quality solutions.

### Embrace Phased Development

A key attribute of modernization programs is that initiatives can be structured and prioritized in line with business strategies. Phasing initiatives minimizes risk to the organization's ability to deliver on concurrent business objectives and accelerates results. Return on investment can usually be recognized in months rather than years. It is not uncommon for funding on continuation initiatives to be derived from the benefits of initial initiatives.

### Value Time to Results over Lowest Rates

The inherent complexity of a modernization project can be best managed by experienced staff working with disciplined development methodologies. That means low cost should not be the sole criterion for your solution. Although it's easy to compare rates charged for development, it's much more useful to compare the actual experience of the modernization teams as well as the quality of their skills and tools.

## Case Study

Company: Acme Distribution

Revenue: \$5 Billion

Industry: Industrial Products

### Modernize or Replace?

After conducting an assessment of their legacy mainframe application, Acme Distribution determined that it was sufficiently strong to support a modernization program. (The company also monitored its main competitor's progress in implementing a new enterprise solution. When they learned the expense of the new implementation and the impact on business operations during implementation, Acme decided to modernize their mainframe application.) The initial scope of the modernization initiative was limited to the customer-service operation as determined by the business-value opportunity. Below are the objectives, roadmap, and technologies used, as well as the business and IT value achieved.

### Modernization Objectives

- Improve the productivity of customer service representatives.

- Continue to facilitate high-touch service support with key customers.
- Enable customer self-service options and make them attractive to use.
- Free up time for CSRs to shift efforts from problem solving to demand planning and promotional selling.
- Reduce the cost of hardware by moving the mainframe application to a lower-cost platform concurrent with modernization.

#### **Modernization Roadmap Components (Two-Year Horizon)**

- Migrate the mainframe application to a Windows platform.
- Develop a reengineered customer-service user interface without applying any code changes to the mainframe application.
- Use a smart-client user interface to provide a rich user experience.
- Develop a collaborative framework to improve demand planning and reduce back-order problem solving.
- Develop a CSR-oriented process to support promotional selling.

#### **Modernization Program Technologies**

- The Microsoft .NET technology platform was used to create the n-tier, SOA, standards-based enterprise architecture. (Java could have been used to deliver similar benefits.)
- Attachmate® Verastream® Host Integrator was used to modernize all legacy applications by exposing business processes as reusable web services and .NET components. (Verastream-generated services can be mixed, matched, and reused selectively to extend legacy functionality to new supply-chain applications or users.)
- Smart-client technology was used to facilitate a rich user interface with Microsoft ClickOnce deployment .

#### **Business Value Achieved**

- A 20-percent productivity improvement was achieved across the customer-service organization.
- Number of back orders was reduced by 25 percent as a result of collaborative planning. This in turn improved forecast accuracy.
- CSRs went from occasionally up-selling to committing 25 percent of their time to promotional selling.
- Training time and time to proficiency for new CSRs was reduced.
- Vendors increased their willingness to run promotions based on proven results.

#### **IT Value Achieved**

- Architecture flexibility reduced the time and cost to develop new functionality.
- Dependency on COBOL resources was reduced as more work was done off the mainframe.
- .NET technical resources were readily available in the market.
- Hardware costs became lower as applications migrated off the mainframe.
- Mainframe platform management skills were no longer necessary, so required range of IT management skills was reduced.

Acme Distribution is a composite customer from multiple clients to highlight available features of modernization initiatives. Results are typical of modernization initiatives but are not specific to one client.

### Lessons Learned

- Migration off the mainframe can be done concurrently and complements the modernization of the user interface and the development of a modern SOA enterprise architecture.
- User teams had been too close to their existing processes to generate break-through thinking, which required outside subject-matter experts to effect real reengineering of processes.

### Mainframe Modernization Readiness Checklist

- ✓ The existing mainframe solution provides competitive advantage.
- ✓ The risk or cost of replacing the mainframe solution is perceived as too great.
- ✓ The time to modify the existing environment limits strategic agility.
- ✓ There is a champion for modernization within the organization.
- ✓ There are near-term business opportunities that could be executed within a modernization program.

### About Verastream Host Integrator

Attachmate Verastream Host Integrator encapsulates mainframe data and logic via the application interface to enable participation in today's service-oriented architectures. Verastream transforms the full range of enterprise host applications into SOA assets by exposing business processes as web services, XML, Java, or .NET components.

With Verastream, you get rapid results because you can use existing development skills, familiar IT tools, and proven mainframe investments. Whether your environment is IBM System z (S/390), IBM System i (AS/400), UNIX, OpenVMS, or HP e3000, Verastream Host Integrator can help modernize your legacy assets—without disturbing mainframe-application code or daily business operations.

### 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 the performance, security, and compliance of your 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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