

The Business Value of Integration and Automation for Midsize Companies

Microsoft Corporation

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Abstract

The rising tide of government and partner mandates are having an impact on midsize companies in the supply chain, who are finding it necessary to integrate and automate their business processes in order to stay competitive. Beyond the imperative of compliance, a number of supply chain management studies are pointing to integration as critical to greater business profitability. This paper explains integration and automation, how they enable midsize businesses to improve supply chain functioning, and some broad principles to be aware of when looking to find effective integration and automation solutions. The paper concludes with an overview of the Microsoft® integration, automation and business process management solution, BizTalk® Server.

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Introduction

Almost all organizations have a pressing need to optimize business processes across their extended supply chains. One of the most pressing reasons is the increasing number of regulatory demands, such as the Sarbanes-Oxley Act, the Electronic Communications Privacy Act, and other regulations like the Health Insurance Portability and Accountability Act (HIPAA). Demands for compliance don't stop there, however; major manufacturers, retailers, and government agencies have ordered their suppliers to adopt new technologies, such as radio frequency ID (RFID), to more effectively monitor the flow of goods throughout the supply chain. As a result of these new directives, many companies are forced to make significant changes in their corporate policies, business processes, and supporting information technology (IT) infrastructure.

But meeting the challenge of increasing regulation and mandates by integrating business processes is more than a challenge—it's also a significant opportunity.

Most midsize organizations have the advantage of having well coordinated and tightly integrated business functions and, as a consequence, can be flexible and adaptable in a changing marketplace. The constraint, of course, is that many market changes (such as the need to comply with new regulation mandates) either demand resources (such as large IT budgets and staffing resources) that are either simply not available or require processes that go beyond an ad-hoc reactive approach to managing change. However, failure to provide a key customer the service it demands—the product delivered to the right place, on time, at the right price—can result in the loss of a contract that represents a significant percentage of annual revenue. And losing a key contract can be the difference between remaining in business and becoming one of the hundreds of thousands of businesses that go under each year.

For midsize organizations to remain a competitive link in the supply chain, increased responsiveness and flexibility are critical, and integration has become one of the keys to staying competitive. If integration is something you've heard about but not taken action on—especially in light of increasingly tight budgets—there's good evidence to suggest that it's time to take another look. Large organizations have recognized for the better part of a decade that integration (both business to business and within the company itself) is key to staying not only competitive, but ahead of the game.

And one of the most comprehensive supply chain studies to date, ongoing multi-year research study by MIT¹, shows that supply chain integration—the removal of informational barriers within and among organizations (including suppliers and customers)—has the greatest impact on the bottom line.

Why does integration work? Because taking a strategic approach to managing the supply chain reduces costs, increases efficiencies and establishes an IT infrastructure that can help to accelerate growth. For many midsize businesses, taking a strategic approach to catalysts like compliance represents an opportunity to strengthen internal and external supply chain processes.

This paper attempts to demystify supply chain integration and automation, explaining what it is (both between and within businesses), why it can provide value and strong competitive advantage to your

¹ Linking Supply Chain Practices to Operational and Financial Performance, Supply Chain 2020 Project Working Paper, August 2005, available at <http://ctl.mit.edu/public/SCM%20Versus%20Performance%20Final.pdf>

organization, and how you can achieve it using familiar Microsoft products that you may already have in your organization.

Defining Integration and Automation

The key to staying competitive and remaining an integral part of the supply chain is to effectively provide goods and services to your trading partners. In the era of the Internet, the traditional means of conducting business using paper-based purchase orders, invoices, and receipts is fast becoming obsolete. Phones, faxes, and even e-mail as a means for conducting business are taking a backseat to e-commerce in which the operational core of the trading relationship is automation.

Shifting from manual to automated trading—from online product information to online buying systems to automated warehousing and delivery, as well as to automated billing and post-sales—necessitates the connection of systems, people, and processes. This shift, from disparate to interconnected systems that are able to route information automatically, is at the core of integration.

Integration refers both to streamlining communication *among* businesses as well as streamlining communication *within* a company, such that data residing in various databases, applications, or between departments can be connected to enable the creation and extraction of business intelligence. Effective integration makes exchanging information—whether within or between companies—easier to manage, more cost effective, and flexible enough to adapt to future needs.

Connecting systems together not only paves the way for automating the business processes that cross functional areas within and between organizations (such as linking customer relationship management systems to sales and financial systems), it can also open the door to business process management solutions, which provide the tools to optimize business processes.

Early Integration and Automation Approaches

Early integration attempts took a customized programming approach to tying together and automating exchange of data between different systems. While solving the problem at hand, the downside of such an approach is that the software is very costly and rarely reusable. In-house attempts at tying together different data systems have the same problems, as well as suffering from a lack of standards, limited documentation, and relying heavily on the expertise of one or a few individuals.

In fact, effective integration is more than just connecting one or two isolated computer systems. Adding standalone software designed to solve a specific problem—getting software from different platforms to exchange information, for example—may solve the current problem, but it invariably increases overall IT complexity and management costs.

This is obvious as the number of applications requiring integration grows. Tying together software in a point-to-point fashion and automating the exchange of messages between them is costly and complex to maintain, especially since specialized “adapter” software is required not just for each additional application, but for each application to join to every other application in the group. (The number of adapters grows exponentially: if N =number of applications, the number of adapters to tie each to each is N^2-N .)

Because Integration tools can be limited to specific services, such as sending and receiving messages between different systems, they can be acquired individually. However, purchasing integration tools piecemeal generally results in overlapping product functionality, not to mention proliferation of software and multiple management tools, all of which requires both considerable management and maintenance resources.

Integration and Automation Today

The most flexible of integration software not only spans data, applications, people, and, ultimately, to business processes themselves, but does so in a way that automates interactions among multiple systems in a way that is standardized and easy to use.

Today's integration software (also known as middleware) is designed to "glue together" or integrate other software throughout the business, both within and between organizations:

- **Business to business (B2B) integration** solutions integrate systems and automate information between organizations, such as between suppliers, partners and customers. Critical to these solutions are security, speed and robust communications.

Note that while it is possible to integrate and automate trading partner relations by going through an electronic marketplace designed to bring together suppliers and buyers. However, these value-added networks or VANs are not only costly, but they are, by their very nature, restrictive of the ways in which you can differentiate your products from those of your competitors. As such, their value proposition can be more limiting than a software solution adopted directly by your company.

- **Enterprise application integration (EAI)** software ties together and automates interactions across multiple applications within an organization, and does so irrespective of the platform and underlying software. EAI was originally limited in scope to tying together disparate data systems. Today, EAI also ties together applications, systems, and business processes within the organization, and can do so at a price that is no longer cost-prohibitive for small and midsize organizations.

Whether within a single company or across different organizations, the goal of integration and automation is to enable both technical and business people to gain visibility into critical business processes. As will be seen in the next section, such visibility is key to maintaining your organization's competitive position in the marketplace.

Why Integrate?

According to some industry analysts, large companies can spend as much as 40 percent of their overall IT budget on achieving integration. While such spending may seem daunting to the midsize or small organization, consider this. A 2004 National Institute of Standards and Technology (NIST) study of the capital facilities industry (which includes design, engineering, facilities management, and business processing software systems in all aspects of facilities management), concludes that poor software interoperability cost the industry 15.8 billion in 2002, a conservative estimate of losses due to inefficiencies². Similar studies reveal equally staggering costs (see, for example, a 2001 manufacturing study by the National Coalition for Advanced Manufacturing [NACFAM]³, as well as a NIST study of the impact of integration inefficiencies on the automotive supply chain⁴).

Benefits of Integration and Automation

These studies, and others like them, demonstrate that there are compelling reasons to consider the benefits of today's integration software—and all of them revolve around the positive impact on the bottom line. But the ways in which integration can contribute beneficially to the bottom line might be surprising. These include:

- **Lowered IT costs and more effective IT solutions.** Rather than maintain a system of decentralized systems from which information technology staff must attempt to obtain business process intelligence piecemeal, an integrated solution is simpler to manage and maintain. Moreover, integrated solutions, because they are designed to work as a comprehensive whole, can improve the performance, scalability, and throughput of multiple, non-integrated solutions that must otherwise be cobbled together to work.
- **Improved organizational efficiencies.** Automating critical business processes can help to streamline trading operations, from procurement through payment. Improved operational efficiencies in turn help to reduce personnel costs (since there are fewer costly manual processes) as well as to decrease inventories and associated costs (through the use of, for example, just-in-time warehousing and delivery).
- **Increased customer satisfaction.** Improving operational efficiencies results in improved speed of delivery on all customer related issues, from product sales to customer service issues. These improved efficiencies are true not just for customers, but spread throughout the supply chain to include suppliers, partners, and teams within the company itself.
- **Improved business agility.** Increased visibility into business processes enables businesses to improve and optimize operational efficiencies through business process management, helping

² Cost Analysis of Inadequate Interoperability in the U.S. Capital Facilities Industry.

<http://www.bfrl.nist.gov/oa/publications/qcrs/04867.pdf>

³ Exploiting E-Manufacturing: Interoperability of Software Systems used by U.S. Manufacturers, February 2001.

<http://www.mel.nist.gov/div826/msid/sima/FinalReportSummary.PDF>

⁴ Interoperability Cost Analysis of the U.S. Automotive Supply Chain, March 1999.

http://www.isd.mel.nist.gov/projects/metrology_interoperability/Gallagher.pdf

to increase overall competitiveness. A tightly integrated business can not only help an organization to keep up with or outpace competition by enabling faster time to market, but it can also provide solid strategic advantage through shared knowledge and insights leading to the development of new business initiatives.

Problems Integration and Automation Can Help

How do you know if integration and automation might be helpful to your organization? Your organization may be ready for an integration solution if it has grown to the point that:

- Previously effective business processes, particularly manual ones, now introduce errors resulting in increased costs, lower profits and decreased customer satisfaction.
- Operational efficiencies, such as the managerial decisions, production performance, and the ability to predict customer buying patterns, are diminished.
- The total cost of ownership of IT investments is escalating because of increased maintenance requirements (especially with legacy systems), a greater need for customization, and underutilization of existing resources.

Most of the points listed above address the benefits of incorporating an integration and automation solution within your business—which for many organizations is the first place such a solution is considered. But what are the specific business processes within your organization that might benefit from an integration and automation solution?

In **operations**, look at how effective your company's order processing, production planning, inventory management, and procurement procedures are. Automation in these areas, and more effective integration with other departments, especially sales and marketing and finance, can boost effectiveness.

In **finance**, where comprehensive, flexible insight into your company's financials is key to long-term strategy, automating cash management, switching to online payments, and automating corporate governance can be critical to company success.

Similarly in **sales and marketing**, automating the sales process, creating a customer self-service Web site, and automating support can not only improve customer satisfaction and retention, but can help provide comprehensive insight into your customers' behavior.

Overall, the effect of integrating systems, processes, and people within a company is to create an infrastructure that enables your employees to find and use information and to communicate effectively with one another and with your entire supply chain.

Environments Benefiting from Integration and Automation

Extending the integration and automation solution beyond the immediate company walls is critical to many midsized businesses, both to those who have experienced recent growth, and to those who find it necessary to comply with customer mandates. Such a solution is critical if your environment requires:

- **Branch or inter-office connectivity.** Medium-sized businesses that have experienced recent growth or acquisition and have a number of separate sites can benefit from integration of equipment and automation of business processes.

- **Vendor and Partner Compliance.** Effective management of supply chain relationships requires standardization of information from partners and vendors. More and more large companies are demanding that their suppliers improve transaction speeds and accuracy, as well as complying with government mandates that they are required to meet.
- **Customer Self-Service.** Whether internal or external to the company, many customers are demanding that information be available to them “on demand.” Obtaining visibility into organization-wide internal processes requires not only integration, but also a means by which to monitor and customize or optimize business activities in real time.

If the rationale for integration and automation makes sense for your organization, what are the basic steps to achieve such a solution? These steps are explored in the next section.

Achieving Effective Integration and Automation

Helping your organization achieve an effective integration and automation solution requires that you be aware of several key factors, from the software itself to the approach your organization takes during the integration process.

Effective Integration and Automation Software

The most effective solution:

- **Is standards-based.** Integration and automation is a ground-up effort based on standards implemented at every level. The framework upon which it is built has at the foundation network integration, based on standards such as TCP/IP, and data integration across applications and platforms, based on standards such as HTML and XML. The Web services protocol (known as Simple Object Access Protocol or SOAP) enables diverse applications—including applications on different platforms—to automatically call the services of other applications. Together, these standardized communication protocols have helped to drive the costs of integration and automation solutions down, even as it has raised the effectiveness and broad applicability of the software.
- **Abstracts core integration logic.** Achieving the goal of integrating business processes in a flexible, robust manner depends on abstracting core integration logic. This means that key integration processes must be abstracted such that disparate applications and platforms can communicate effectively. These processes include *connecting systems* (to send and receive messages, to process messages [that is, translate from one language to another], and to direct them to the appropriate next step in the process), *executing critical business processes*, and *managing and monitoring* the integration software itself.
- **Provides valuable business intelligence.** It is not sufficient for an IT worker to be able to collect and manipulate data across the organization—that data must be accessible to and understood by the business people that make corporate decisions on a daily basis. Therefore, business information must be able to be extracted into various views that help determine strategic direction.
- **Provides a business process management solution.** Not all integration and automation software support the logical next step: a means by which to improve and optimize business processes. Business process management (BPM) software enables the business user to define and hand-off to IT the basic model of business process workflows and operational rules. In turn, IT delivers back to the business user a means to monitor and change business processes to optimize organization functioning. Ideally, the BPM solution is focused on providing a rapid and easy-to-use solution to business users that provides them with real-time insight into linked processes across the organization.

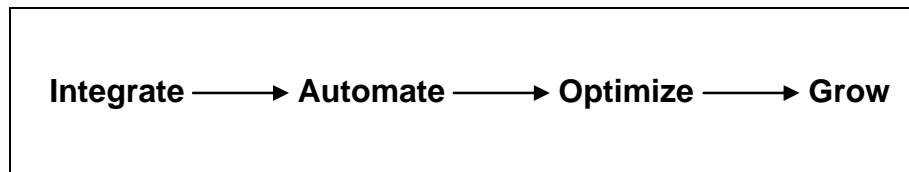
A Few Other Factors to Consider

To develop an effective solution strategy, it is critical to identify the key business processes requiring integration and automation. Without a clear understanding of the business problem to be solved, progress will be slow and fraught with difficulties.

It is also crucial that any integration plan receive buy-in from the key players, including business and technical decision makers. These stakeholders will help make it clear to the organization the scope of the problem and the individual and corporate-wide benefits of integration.

It may be useful for midsize businesses just beginning to get their feet wet with these technologies to see integration and automation as the first steps in a larger process. Organizations start with the integration of systems within and between organizations. Once systems are connected, automation is a natural byproduct, and often organizations can expand the scope of the solution by identifying handoffs between systems and people. Automating many of people-system interactions (which often arise when something goes wrong in a process) helps organizations gaining further operational efficiency and can greatly enhance customer responsiveness. And with visibility into business processes across functional areas within or between organizations, the final stage is to begin to the iterative process of optimizing business processes through business process management.

The complete approach can be summarized as follows:



While integration and automation can often be executed fairly quickly, beginning the process of optimization through the discipline of business process management and the use of associate software is a much more significant undertaking, and at its core involves changing the way organizations do business. Business process management is not intended to be a single fix; instead, it is an ongoing iterative approach to improving daily business practices.

Integration Using BizTalk Server

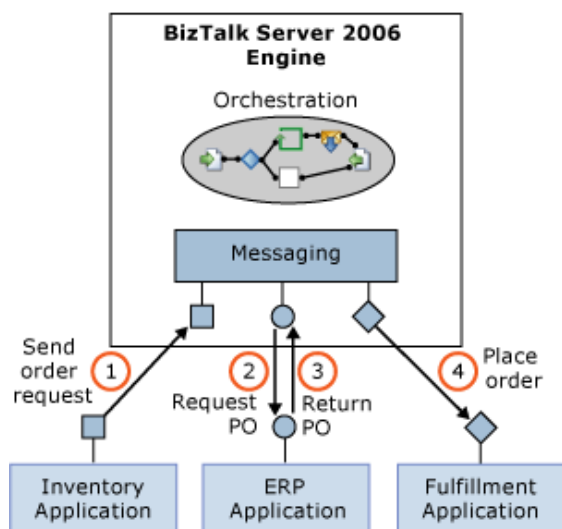
Having provided the generalized background information to integration, these next sections deal with the Microsoft integration solution offering, BizTalk Server.

Microsoft® BizTalk® Server 2006 helps organizations efficiently and effectively integrate and automate across systems, employees, and trading partners. The fourth major release of the software, BizTalk Server 2006 builds on the Microsoft integrated server software and Microsoft .NET Framework. This framework enables businesses to connect and automate transactions between diverse applications, and provides a straightforward and intuitive means for business users to create and modify business processes to help optimize daily business practices.

B2B, EAI and Business Process Automation All In One

BizTalk Server enables you to integrate and automate not only systems that support the day-to-day business workflows within your organization, but also integrate, automate, and secure transactions between your organization and your business partners. Additionally, BizTalk Server gives business analysts the simple tools with which to gain critical visibility and insight into business processes across functional divisions, providing the means by which to optimize organizational functioning across the extended enterprise.

The following figure shows a simple example of the core Microsoft BizTalk® Server 2006 engine applied to an Enterprise Application Integration (EAI) problem, in this case, integrating multiple applications (an enterprise resource application and two others) within a single organization.

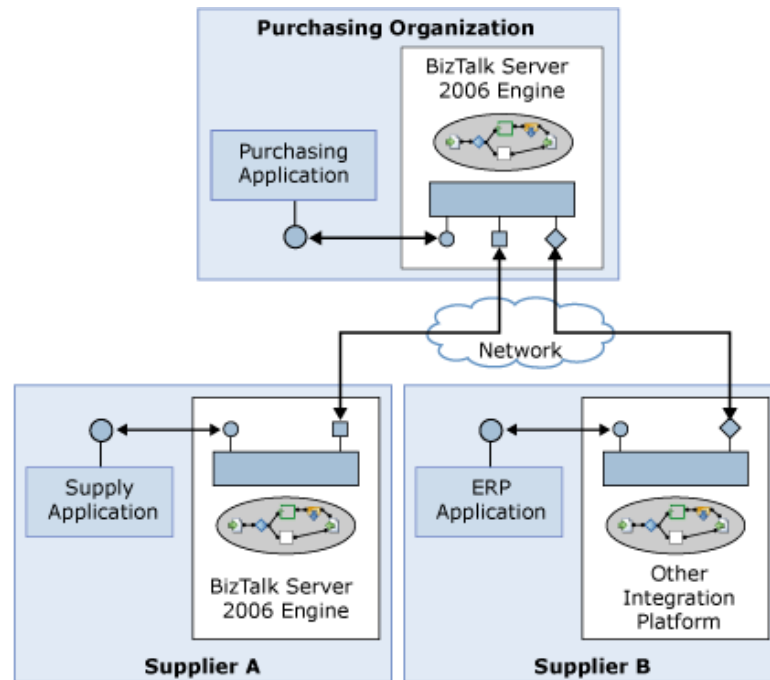


The Microsoft Advantage

Here are just a few reasons why building your business with solutions and services from Microsoft and our experienced partners makes sense:

- Designed to work together.** Our solutions are designed to work together and are built according to familiar, reliable and easy to use standards to help you achieve your business goals.
- Innovation is key.** A significant investment in research and development ensures that our software solution will continue to evolve with your needs and help you achieve a competitive advantage.
- Easy to learn and use.** Our software has a common interface that is known by your employees, resulting in a shorter learning curve. This cuts training and development time, enabling you to achieve your goals quickly, easily, and cost effectively.
- Widely used and supported.** Microsoft makes some of the world's most widely used business software, and works with the largest community of partners, suppliers, and service professionals—giving you the confidence that your investment will continue to meet the needs of your ever-changing business.

BizTalk Server is unique in not only being able to connect applications within an organization, but also being able to connect applications that span organizations, thereby offering even more business value. The following figure shows a simple example of a partner (B2B) integration scenario.



BizTalk Server allows you to maintain a comprehensive database of trading partner information, including profiles of each partner and the specific business processes between your organization and each partner (such as whether the trading partner is a buyer or seller, for example). Through improved business-to-business integration, the costs associated with connecting customers and suppliers can be dramatically reduced, the processes among them automated, and real-time visibility into the supplier chain gained, all of which enable proactive management of transactional issues as they arise.

Note that in both examples shown, the messaging step—sending and receiving messages from sources (data, applications, or platforms) both within and outside of the company’s firewalls—requires “adapters,” that is, software that serves to translate communication protocols and data into a format that can be used to gather business intelligence. BizTalk Server 2006 comes with a number of common adapters in-box.

BizTalk Server also provides developers with a number of “accelerators” that significantly reduce the time required to develop a custom business solution in specific industries, such as health care, financial services, and supply-chain management.

In addition to connecting with applications within and between businesses, BizTalk Server provides the tools, technologies, and infrastructure to automate complex business processes from end to end. These “orchestrations” of business processes increase productivity, provide critical real-time insight into key business metrics, and can be optimized to help ensure continuous, high-quality customer experiences.

BizTalk Server 2006

BizTalk Server 2004 is a robust integration and automation solution, but the newest release improves upon its capabilities in a number of ways.

BizTalk Server 2006 dramatically simplifies installation, adds in better support for deploying, monitoring and managing applications, and improves Business Activity Monitoring capabilities. For more information on this release, visit the BizTalk Server home page at <http://www.microsoft.com/biztalk/default.aspx>.

BizTalk Performance

How does BizTalk rank with respect to integration costs and overall return on investment (ROI)? Nucleus Research, an independent research company specializing in ROI analysis of technology, has compared Microsoft's BizTalk Server 2004 with a number of other supply chain integration products. Nucleus Research defines integration ROI as an overall score consisting of the following:

- Ease and speed of *deployment*.
- Usability and scalability of *adoption*.
- Ability of the solution to function with limited internal *support* costs.
- Potential of the solution to deliver clear and repeatable *business benefits*.
- *Vendor* track record.

Based on these integration criteria, Microsoft's BizTalk server is rated at a score of 4.8 out of a possible 5 points, the highest of the products assessed.

Customers have experience the same satisfaction with BizTalk Server. In 2004, for the second year in a row, BizTalk Server was the recipient of Visual Studio Magazine's reader's choice award in the Middleware and Data Connectivity category. And in 2005, BizTalk Server was selected by InfoWorld magazine as a Technology of the Year Award winner in the Enterprise Applications and Integration category.

Case Studies

Regardless of the industry your midsize company is a player in, Microsoft's BizTalk Server can help you meet the integration challenges that others in wholesale, manufacturing, retail, finance, healthcare, and other industries have successfully met.

For the details on how a diversity of BizTalk users have solved their integration challenges, go to the Microsoft Web site at <http://www.microsoft.com/casestudies/search.aspx?ProTaxID=1265> .

Summary

Smaller and midsize organizations experiencing growth run the risk of losing their competitive edge unless they integrate and automate across the supply chain, the necessary first steps that provide visibility into the business processes that contribute to the bottom line.

Standards-based integration and automation software enables businesses to gain greater visibility into the cross-departmental as well as cross-organizational processes that are critical to improving customer satisfaction and retention levels.

The goal of Microsoft's BizTalk Server is to help organizations meet the challenges of creating integrated business processes across diverse systems. BizTalk Server's reputation as a cost-effective, flexible, and highly robust integration, automation, and business process management system makes it a smart choice for midsize organizations looking to remain competitive and innovative.

Related Links

See the following resources for further information:

- BizTalk Server home page at <http://www.microsoft.com/biztalk/default.mspx>.
- BizTalk Server 2006 Product Overview at <http://www.microsoft.com/biztalk/evaluation/overview/default.mspx>.

BizTalk Server 2006 Case Studie at

<http://www.microsoft.com/casestudies/search.aspx?ProTaxID=1265> .