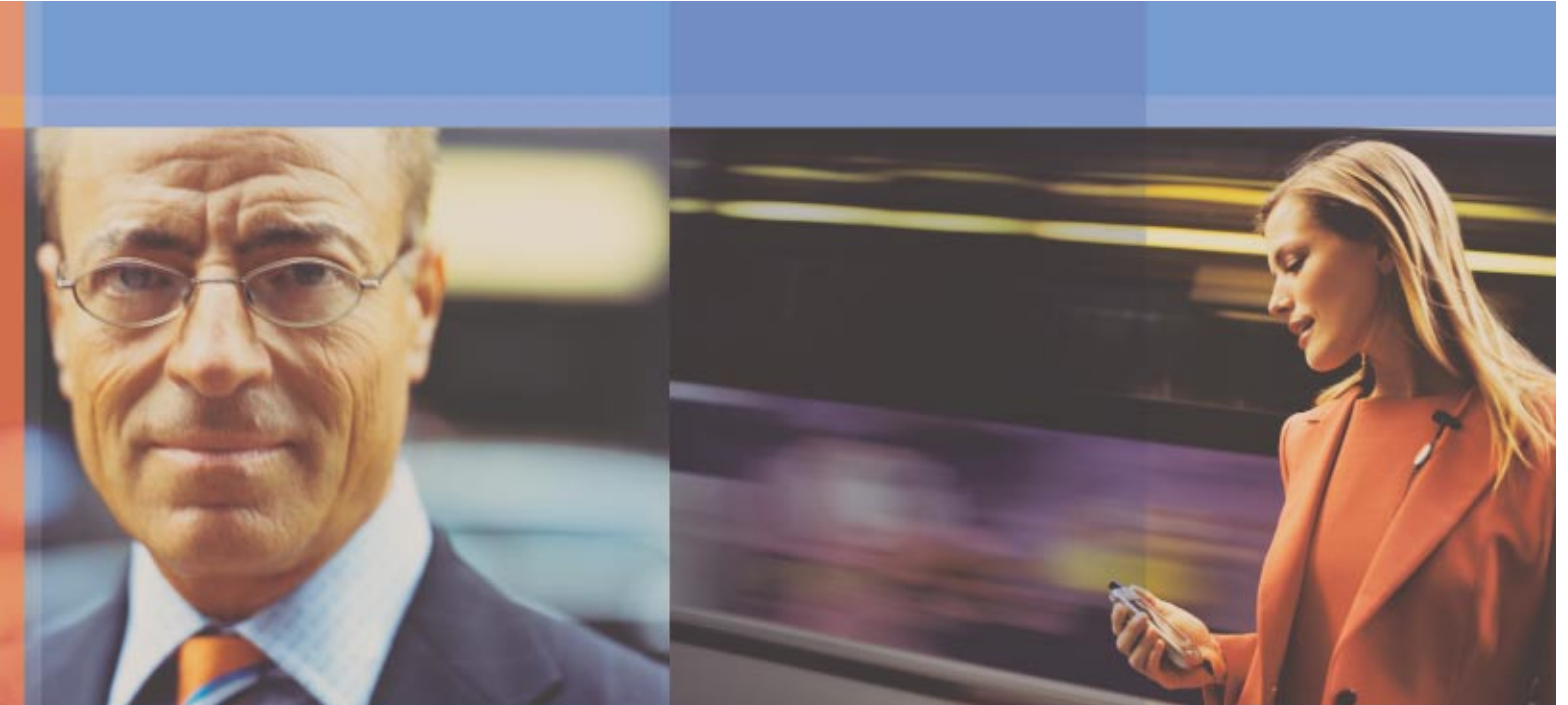


ENTERPRISE INTEGRATION



A Business Decision



Microsoft

Table of Contents

2	Introduction
3	Part One: Bridge to the Future
3	Enterprise-wide Gaps
3	Manual Processes
4	Custom-Coded Solutions
5	Business-to-Business Integration Challenges and Opportunities
6	Enterprise Integration Platforms
7	Summary
8	Part Two: Integrating the Enterprise
8	The Selection Process
8	Objective Setting
9	Evaluation
12	Pilot Project
12	Implementation
12	Conclusions



Enterprise Integration: A Business Decision

Introduction

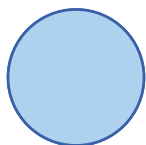
Today, organizations are facing an unprecedented set of business challenges driven by the advancements of information technology. The Internet has created a common network that has compressed distance and time on a global basis. Customers are demanding faster, more real-time levels of service. Product life cycles are decreasing at a faster rate than ever before. Financial markets are rewarding highly efficient business models and execution and are an active force in precipitating corporate consolidation and specialization. Traditional barriers to entry are no longer sustainable. Companies must become more agile in order to react to these increased pressures and create a sustainable competitive advantage. Agility is defined as an organization's ability to react to changing market dynamics both strategically and operationally, almost in real time. Business agility is driven by an organization's infrastructure, which should enable it to integrate new business processes efficiently and flexibly. Companies must be able to integrate business processes that reduce inefficiencies in the value chain, and they must do so faster than the competition. Traditional attempts at process integration have fallen short of expectations primarily because of the difficulty of integrating the applications that support business processes. Historically, connections between systems have either been programmed internally with time-consuming, inflexible point-to-point interfaces or externally with high-cost, inflexible forms of business-to-business connections such as EDI.

There are now a number of solutions in the market that enable organizations to resolve application integration issues much more rapidly and with greater flexibility than was possible in the past, while avoiding the problems associated with both point-to-point and EDI integration approaches. These solutions typically offer integration capabilities in two forms: enterprise application integration and business-to-business integration, together called enterprise integration (EI). Enterprise application integration (EAI) is the integration of *internal* applications within an organization. It is distinguished from business-to-business integration (B2Bi), which involves the integration of applications with *external* business partners (such as customers, channel partners, and suppliers). Historically, organizations have typically focused first on developing an EAI infrastructure that integrates internal applications and then on extending these integrated systems outside their walls to achieve new connections with business partners.

For those considering an enterprise integration project, this document provides guidelines for making a decision on acquiring EI technology. Part One describes the components of EI, how it bridges the application gap, and how purchasing an EI solution is the best option for successful application integration. Part Two focuses on how to select and implement an EI solution that delivers the best long-term advantages and maximum return on investment.

EI is conceptually simple, but its implementation can be challenging in a highly distributed business process landscape with a great diversity of systems and applications both inside and outside traditional organizational boundaries. By having a full understanding of what EI is and what it can do for you, you can more successfully guide your organization through an integration process that can significantly reduce organizational costs and increase competitiveness in the rapidly changing global marketplace. Tomorrow, competitive advantage will be realized by those companies that achieve a highly efficient infrastructure capable of integrating applications and processes anytime, anywhere.

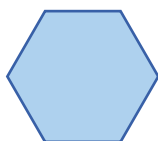
Part One: Bridge to the Future



Human Resources

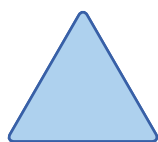
Enterprise-wide Gaps

Businesses and governments have made enormous investments in information technology over the last few decades. The bulk of these investments have been made acquiring and deploying best-of-breed applications that perform specific functions, such as manufacturing, inventory, accounting, payroll, and sales. When evaluated independently, these systems have performed well and have contributed to a significant increase in productivity compared to the largely manual processes employed historically within each discrete area.



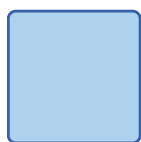
Operations

Yet businesses these days are hardly running themselves. Many of the most important business processes are executed in a highly manual fashion, which is both time-consuming and error-prone. Businesses also spend large amounts of time transferring data manually from one system to another by printing and rekeying that information, creating more errors. They still struggle to collect vital information from the various areas of their organization for consolidated reporting, and they still fill in the gaps between various systems with paper, phones, faxes, and a significant amount of human labor.



Sales

Despite efforts to further automate end-to-end business processes, integrating the enterprise remains an enormous challenge. The reality is that while self-contained systems tend to be effective at performing their specialized functions, they are incapable of gracefully connecting to and communicating information between other business processes in an automated fashion. As the systems become more and more specialized, they provide value in their own (increasingly narrow) functions, but are not seamlessly integrated with other systems to provide support for the execution of truly comprehensive and integrated business processes.



Manufacturing

To become competitively agile, a corporate entity must have systems that work equally as well together as the respective individual components work alone. A simple sales order can ripple out to affect inventory, shipping, purchasing, accounts receivable, and payroll. When these software systems work in isolation, the ripple effect must be propagated by hand: output from one system is sorted, processed, and input into another system. Perpetuating this highly manual mode of operation reduces the competitiveness of an organization over time. So although a company may spend millions of dollars on IT systems, when those systems aren't effectively integrated, they leave a tremendous portion of the true end-to-end business processes unperformed.

Manual Processes

Organizations that must rely on manual processes to bridge the gap between applications face two challenges. First, manual processes result in excessive administrative and operational costs. Employees from every area spend time collecting data, shuttling information between departments, and rekeying that information into other systems. Second, these manual processes provide endless opportunities for human error. Consequently, organizations must then compensate for these inefficiencies by implementing costly offsetting mechanisms, such as overstocking goods (and bearing high inventory carrying costs) to avoid losing revenue from stock-outs.

These inefficiencies further impact businesses by depriving them of a strategic advantage over the competition. Manual processes make it harder to consolidate data to support faster and more insightful business decisions, implement and change business processes that support new programs for customers and partners, and respond to competitive threats. If a company's goal is to deliver the lowest price, gaps in its IT systems will drive up costs, and the manual nature of these processes will slow it down. If the corporate mission is to deliver constant innovation, a lack of integration between internal departments will make it harder to bring new products to market.



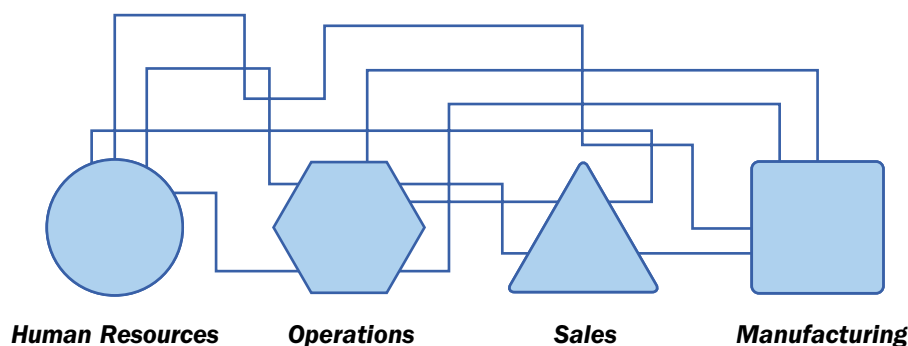
Put simply, the lack of integration within a corporate IT infrastructure drives up costs, slows down business, and therefore stands in the way of strategic advantage.

Custom-Coded Solutions

Companies that wish to avoid the pitfalls of inadequate integration and the disadvantages of costly manual processes are presented with two options: build or buy. The build approach to application integration represents writing custom, point-to-point interfaces to integrate the desired applications, whereas the buy approach means investing in an EI solution that provides a reusable set of integration services.

Historically, companies did not have many viable options to buy an EI solution sophisticated enough to meet their integration needs. Innovative companies looking for a competitive advantage opted to develop homegrown custom solutions to address their internal integration needs. At the time, these homegrown solutions were the best available option. However, as EI technology has progressed, these integration issues can now be managed more successfully through a third-party integration product. In fact, organizations that continue to pursue a custom approach to application integration face significant challenges and risks:

Complexity: Custom-coded solutions tend to address integration by relying on point-to-point connections between applications. Since one transaction can impact any number of systems across an organization, each application must be able to share data with every other application. If an organization relied on only a few processes running on a few systems, developing and managing these hand-coded connections wouldn't be much of a concern. However, integrating a dozen processes that touch several systems is a different matter, as each additional system makes developing and, more importantly, managing the point-to-point connections increasingly complex. Over time, this results in an elaborate mesh of "spaghetti code" that is impractical and often impossible to maintain in a cost-effective or timely manner.



Speed of integration: Understandably, if a company's IT team has to hardwire every point of contact between its systems, the project is going to take some time. Too much time, in fact, to compete against organizations that are integrating their systems in a more efficient manner. While the IT department struggles to custom-develop hand-coded solutions to integrate each application, the rest of the organization must continue to rely on the costly and error-prone process of manually transferring data from one application to another. Furthermore, strategic initiatives that hinge on the integration must be put on hold—as must the anticipated return on investment.

Cost-effectiveness: Custom-coded EI solutions are costly and highly inefficient. Hand-coding a custom solution demands enormous IT resources, certainly during the planning and development stages, but also on an ongoing basis as the system requires maintenance and modifications. Given the time and resources required, custom coding results in a high total cost of ownership and, therefore, a low return on investment.

Lack of flexibility: With a multitude of hardwired connections, custom-coded systems are inflexible and difficult to modify. The “tightly coupled” nature of these application connections means that changes to one application usually necessitate changes to the connected applications as well. As a result, organizations relying on custom-coded, point-to-point connectivity are often slow to adopt new business initiatives. Their capacity to react to competitive situations or pursue new opportunities is directly impeded by their inability to update their systems in a timely manner. Understandably, organizations that have proceeded down the challenging path of a custom approach to application integration are reluctant to discard their development efforts and abandon their sunk costs. However, when faced with the consequences of maintaining their costly and inflexible custom solutions, many organizations realize that a dynamic integration strategy provided by an enterprise application integration solution is a far better alternative.

Business-to-Business Integration Challenges and Opportunities

The massive investment in the global information infrastructure has created substantial opportunities for organizations to enhance performance through increased collaboration among multiple organizations. At the same time, these opportunities come with similar challenges of being able to facilitate the connections among these systems.

To appreciate the potential value of B2Bi using technology based on open standards (primarily XML for data formatting and Internet transports for data transfer), it is worth examining how the legacy approach for electronic commerce, Electronic Data Interchange (EDI), has fared since it was introduced nearly thirty years ago.

EDI was an initiative started in the 1970s to give computers the capability of exchanging structured business transactions with one another. This was very ambitious at the time, because mainframe computing was relatively primitive and expensive, and outside of the Public Switched Telephone Network for voice communication, there was no public network for exchanging data. The entire infrastructure had to be built without the benefit of any existing standards framework for data exchange or a common network for data transport. Nonetheless, within the largest organizations, the expected benefit of eliminating a large portion of the manual generation, exchange, and processing of business documents was so compelling that high development and implementation costs were justifiable.

By most business metrics, EDI is considered a success, having cumulatively saved these companies billions of dollars in document processing costs. However, the EDI system today is practically identical to the original system of thirty years ago. The primary innovations have been in the data transport networks. The original EDI implementations used dedicated point-to-point connections; and, subsequently, service bureaus established value-added networks (VANs) that functioned as switching hubs for EDI transmissions that were most frequently accessed through dial-up connections.

The data formats for EDI have not changed much either. They are based on “transaction sets” comprised of segments and elements. An EDI transaction set is a specification that uses strictly defined field positions and extensive code dictionaries to qualify the meaning of data. Fields are identified by rigid and specific positioning specifications and codes, and the code values for each field are equally rigid and specific. The format was

also designed to be extremely compact because data transmission rates in the first decade of EDI started at 300 bits per second and eventually grew to 4800 bits per second, so the format itself was extremely cryptic in order to spare every precious byte.

Today, many EDI transmissions take place through Internet connections at high speed, but the EDI data formats have only marginally changed. The fact that EDI is essentially the same today is a testament to its long-term value, but given that EDI is highly specialized and rooted in legacy technology, it is very expensive to implement and maintain. There are hundreds of different transaction sets for different industry segments, made up of thousands of segments, elements, and code dictionaries. A very specialized knowledge and skill set is required to design and implement an EDI system. Once it is created, the system also limits whom you can communicate with. Fewer than 10% of all organizations use EDI, since utilization of EDI is concentrated in larger organizations that possess the specialized skills and substantial resources to implement and maintain it successfully.

Fortunately, a well-designed EI platform supports the ability to generate and consume EDI transaction sets. Often these systems transform the transaction sets into XML and allow them to more readily integrate with many other applications. As a matter of fact, a requirement for EDI capabilities is one of the very best reasons to implement an EI system today, since an effective EI platform will allow organizations to take information generated from any application and convert it into an EDI transaction set that can be subsequently transmitted to an EDI recipient. In combination with support for more recent open standards for application integration, such as Internet technologies and XML Web services, an effective EI platform allows organizations to use the latest technologies to ease intercompany integration while leveraging the investments in information technology that are already in place.

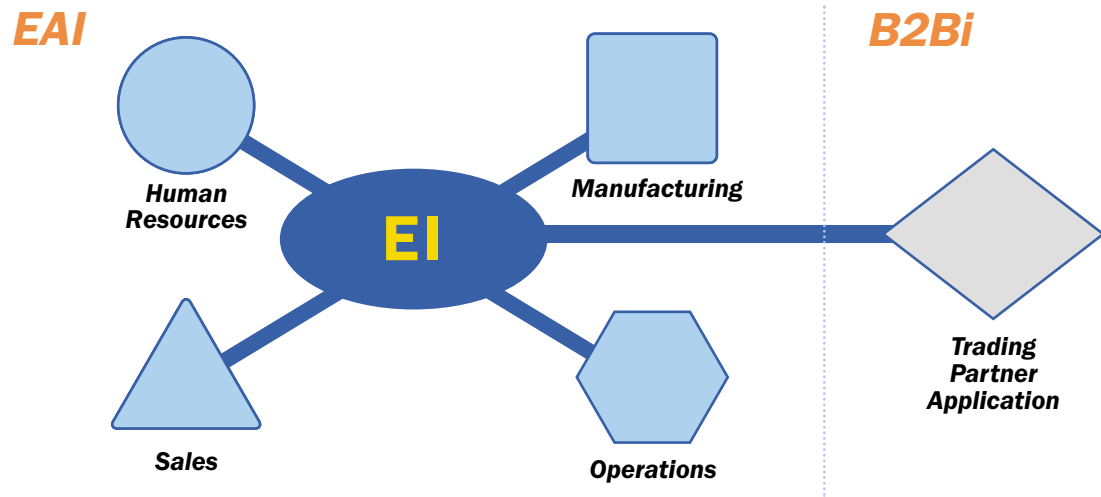
Enterprise Integration Platforms

Companies that are considering buying an EI solution should first obtain a general understanding of how EI platforms work and what features they provide. EI solutions take many different forms and offer a wide variety of features, but they also predictably share a few common functions. In their simplest form, all EI systems perform at least two primary tasks: they provide a common model for receiving, transforming, and sending business documents to and from applications; and they provide a mechanism to deliver those documents to the destination applications—generally referred to as messaging, or more specifically, transport services.

Generally, EI occurs in the following manner: Data (which may or may not be in the form of a digital business document with a predictable structure) from a given operational application is sent to the EI broker. This data may be in a custom, “flat” format, utilized primarily (or only) by that business application, or it could be based on the Internet standard called Extensible Markup Language (XML). The EI system considers the appropriate predefined rules that determine how the document should be processed, then it performs the appropriate validation, transformation, and security steps on that document. The EI system then sends the converted data over the network to one or more other applications that require the data as part of the larger business process. Adapters, or application-specific connectors that enable an application to leverage the services of a given EI system, are also often used to simplify the integration process. In short, EI systems manage the conversion and flow of data between applications so that each system receives the information it needs, when it needs it, in the right form.

The core EI “data transformation and routing” capability is only one piece—albeit one of critical importance—of the EI puzzle, and most EI products today offer more advanced services that complement this core capability. For example, most EI products provide

the ability to model business processes in a graphical environment, a domain that is often referred to as Business Process Management. This is of particular importance because an EI solution should not only facilitate the connection of various applications across the enterprise; it should also allow users to model and view business processes at a higher level. Finally, in addition to providing integration-specific services and complementary development tools, a complete EI solution should also provide the underlying security, communication, and messaging services required, as well as the means to automate deployment and monitor and manage the system.



Typical EI Solution Components

Messaging—Services that support data transformation, document transport, and routing

Business Process Management—Services that support business process modeling in a graphical environment

Adapters and Connectors—Services to support connectivity to specific applications, as well as connectors to various mainframe and midrange systems

Supporting Platform—Services that support multiple platforms and operating systems, communication, security, and fault tolerance

Management and Administration—Services to support deployment, monitoring, and management of the EI system

Security—Services that authenticate the corresponding parties or applications to each other and encrypt the exchange of information between the parties or applications where required

Event Monitoring for B2B Processes—If business-to-business transactions are to be automated through the exchange of messages and documents, it is necessary for an EI platform to provide a set of support functions for these document exchanges, such as receipts and acknowledgments, activity status monitoring, failure or out-of-process alerts, and compensatory events. This feature set is one of the most important to consider when differentiating truly comprehensive EI platforms.

Summary

Faced with the growing costs of hand-coding interactions with applications, processes, employees, and systems, companies are increasingly turning to packaged solutions that can help them meet their integration challenges. Packaged applications are being deployed to help fill the gaps between information silos and provide strategic advantages by allowing the company to conduct business in real time, while effectively preparing the foundation framework for automated interactions with external business partners.

Successfully integrating an enterprise starts with an understanding of what goes into an EI system, what is required to get one up and running, and how the specific features of an EI product can help you or hurt you as you pursue your goals. Part Two addresses these issues.

Part Two: Integrating the Enterprise

The Selection Process

Enterprise integration is not simply an application you install; it is a set of reusable tools and services that can be employed in different ways to address a given integration requirement. Because business processes are constantly evolving, EI solutions must also be adaptable to ensure they provide the underlying connectivity reflected in the ever-changing process. As your business objectives evolve to include organizational ties with your suppliers, your EI system must be flexible and extensible enough to adapt to a changing process and achieve business-to-business connections.

Choosing an EI system is a decision that has significant short-term and long-term implications for your company in both the cost and the tremendous benefits it can provide. To ensure you choose the right product for your business needs, it is just as important to understand an effective EI selection process as it is to understand the product.

This section provides guidelines to help you navigate your way through the selection process.

1. Objective setting. As with any major IT investment, it's best to set clear objectives before you choose which product is right for you. In the case of EI, you will have primary, business-related objectives, which concern what you want an EI implementation to achieve for your company, and you will have secondary, product-related objectives, which concern maximizing your return on investment and minimizing your total cost of ownership. These objectives are discussed in the following section, "Objective Setting."

2. Evaluation. After you've set your objectives, you must pick the EI product that can best help you meet them. For this, you need a solid understanding of EI and how certain features and aspects of EI products can help or hinder you in meeting your objectives. These features are discussed in the "Evaluation" section.

3. Pilot project. Pilot projects are always highly advisable to effectively ascertain how the product really operates and what skills are required to be productive with it. Pilot projects dramatically reduce the risk inherent in large IT projects, and they smooth out the full-scale rollout by identifying potential problems early on. An effective pilot project will include several diverse scenarios that will give you a good end-to-end view of the product. And since a pilot project can usually take place in less than a month, this investment in time has a very high return on investment. Integration projects are always complex and are regularly quite taxing. Obtaining insight into the product before you make a commitment is a good way to avoid obstacles later. The more specific details of pilot projects are discussed in "Pilot Project."

4. Implementation. Whether you bring in outside consultants or have your internal staff do the work, implementation generally accounts for the majority of the cost of an EI system. Your choice of an EI product can make an enormous difference in the speed with which you can implement a solution, the effort required, and the final cost of integrating your IT infrastructure. Navigating these four steps through informed decision making can make the difference between a successful EI project and a costly dead end.

Objective Setting

Setting clearly defined objectives at the start of the EI process is one of the most important steps to achieving a successful outcome. Setting objectives will give shape and direction to your EI project and allow you to more easily gauge the success of your

efforts. Your objectives should include both long-term strategic goals and more immediate targets. One of the most common mistakes in EI projects is setting objectives that are too technically specific, which often results in overlooking options that would, even if less functional, allow integration to be done far faster, less expensively, and more easily than other more complex offerings.

The basic methodology for transacting EAI and B2Bi interactions is fundamentally the same: a transformation hub converts and transfers information between applications and/or external parties. However, for B2Bi implementations, there is a stronger requirement for security capabilities, multiple transport options, and event monitoring facilities, all of which add a degree of complexity to the integration development process. A robust integration platform should provide the infrastructure and feature set to support both EAI and B2Bi scenarios. This gives the organization the opportunity to grow into the platform's extended capabilities based on its own agenda and requirements. The knowledge and experience gained from building internal EAI applications is well leveraged when B2Bi project opportunities present themselves.

Within this framework, you can start by defining short-term projects that should focus on internal-facing goals. These smaller, discrete projects should be constructed around specific business processes that need to be automated. That is, the goal of these projects should be to solve broken business processes in your organization that prevent you from achieving your goals, rather than just connecting a collection of disparate applications together. For instance, if you identify Web sales as your first EI project, consider all the systems and processes that are touched by a sale through your Internet storefront: e-commerce, sales order processing, accounts receivable, inventory, and shipping. The project is not about fully integrating your sales order processing system with all other systems it touches, per se; but, more accurately, it is about following a Web-based order through its entire life cycle from start to finish.

Developing EI projects around business processes allows you to more easily measure the impact and success of your EI solution. Consequently, this will help you justify and prioritize new EI projects to implement in the future. In addition, EI projects constructed around business processes are more representative of the challenges EI solutions should address. A true end-to-end business process usually includes many distributed operational systems, so it's important to keep in mind that the experience of integrating one specific application to another isn't necessarily indicative of the more diverse integration challenges you will have over time with that EI product. EI vendors will want to focus on the very specific areas and features at which they excel. Thoroughly and completely evaluating the strengths and weaknesses of a product, and therefore knowing how effectively it will address your diverse integration requirements over time, is predicated upon implementing a diverse scenario in the proof of concept, or basing the proof of concept on several completely different scenarios. Defining long-term and short-term objectives will make the criteria for evaluating EI solutions substantially clearer.

Evaluation

Once your objectives are defined, the next step is to start evaluating which EI solution will best meet your short-term and long-term goals. The following criteria should be considered in your evaluation process:

Comprehensive and integrated solution: Look for a solution that provides a comprehensive integration platform. Your EI solution should include core integration requirements (data transformation and routing, Business Process Management); an integrated development environment; critical supporting platform services such as deployment and management tools; adapters and connectors; and support for important emerging tech-

nologies such as XML Web services. When all the components of an EI solution are fully accounted for—the supporting tools, the integration broker itself, the database, deployment, monitoring, management, and security services—some integration solutions require five vendors or more. Thoroughly balance the desired risk with the return you are expecting from each approach. Your EI solution should sit easily on top of your existing infrastructure. This means it should be able to work with many different systems, from desktop servers to mainframes. EI does not replace your existing IT infrastructure—it connects your existing systems together.

Even though the immediate focus is on integrating internal applications and processes, the long-term goal should be to extend the integration solution to encompass external business processes. It is therefore important to identify an EI product that is capable of addressing the requirements of B2Bi without requiring the purchase of additional modules or add-on products. Additionally, many EI offerings are comprised of various products acquired from multiple organizations and are not effectively integrated themselves. A common pitfall with EI solutions is that some providers spend more time integrating the integration products than integrating your business applications into processes that will make you more competitive in the marketplace. The best products are pure solutions that were originally designed to encompass both EAI and B2Bi functionality. These products require simpler skill sets to work with, and they can support business process automation more cleanly and smoothly.

Cost-effective solution: An EI solution will be one of the most significant IT investments your company will make, in terms of both the operational impact on your company and the expense. Though you should be prepared to invest a substantial amount of resources into building a solid EI infrastructure, you can minimize your total cost of ownership by following some simple strategies when assessing available EI systems.

Look for a system built using tools, concepts, and technologies that are widely accepted and understood. Systems requiring common programming skills such as VB and COM typically enable you to source your implementation and maintenance team from your own IT department. If resources are still an issue, developers with this skill set are plentiful and, consequently, inexpensive if you have to obtain them from outside the organization.

Avoid any solution that is developed with highly proprietary or uncommon technologies. These products will require specialized skill sets to develop, implement, and maintain the solution—skill sets which must be acquired by hiring expensive consultants over an extended period of time or by training your IT staff on the technology (which will cost both money and time). While every EI vendor will claim its support of standards as a differentiating factor, the reality is that many vendors utilize proprietary formats and technologies for their internal representation of business documents, communications protocols, data mapping routines, and business process definitions.

Focus on total cost of ownership and demand the vendor's full disclosure about the extended cost of the system. EI platforms are intended to be a long-term solution for enterprise integration challenges. Therefore, the initial purchase price of the software is often only a small fraction of the total cost to your organization. In addition, the switching cost of EI infrastructure products is very high, so many vendors are willing to provide the solution for a very low up-front investment on the assumption that they will be able to easily make up the revenue in the medium to long term because of the difficulty you will have in replacing it.

Speed of deployment: Choose a product that can be installed, set up, and rolled out quickly. Systems that have a steep learning curve, require extensive customizations or adapter development, or rely on complex setup processes will consume substantial time and money. An extended implementation phase increases costs and reduces your return on investment. In addition, time to market directly impacts your business agility. You will want an EI solution that can quickly deliver new business processes that help your company become more competitive. When evaluating speed of deployment, consider these factors:

Look for widely available programming skills.

As noted earlier, proprietary technologies and uncommon programming languages not only add to cost, they lengthen deployment times. Leveraging common skill sets allows you to quickly implement, modify, and extend your EI solution as needed.

Make sure your solution has an extensive library of adapters. Adapters can help accelerate speed of deployment by reducing the amount of custom programming necessary to integrate your systems. An EI solution with a large library of prepackaged adapters will provide you with the most flexibility. However, when assessing your adapter needs, also consider that many EI solutions do not require adapters for a considerable amount of integration; this is preferable, as it reduces the complexity of the solution and the cost and time of deployment.

Look for easy-to-use configuration tools that will shorten development time. The development of your business processes and subsequent changes to those processes should be easy to achieve. Therefore, your EI solution should come equipped with tools that allow you to easily configure and modify business processes in a graphical environment.

Scalability and reliability: Adequate performance is an important requirement of an EI system. As your company integrates its IT systems and automates critical business processes, you will rely heavily on the operation of your EI platform. Unfortunately, scalability and uptime are among the most difficult metrics for an EI buyer to measure. EI vendors typically offer benchmark studies to support their claims of product performance. This is a situation where each vendor's benchmark is going to be based on variables and assumptions that, at the very least, favor its product and, more frequently, do not represent the realistic conditions that are required in enterprise environments. Benchmark performance numbers are driven by many different variables, such as the size of the documents transmitted, the data formats being translated, the transport mechanism, and the system configuration. While software vendors will naturally simulate a testing environment that optimizes their product's performance, you should be more concerned with how that product will perform within *your* specific IT environment. The best way to determine if an EI solution can meet your performance requirements is to do a pilot project that simulates a representative scenario of your environment.

Vendor Viability

Historically, the integration software market has been dominated by small niche players, many who struggle to survive and show profitability. As the technology has matured and evolved, the market has been (and continues to be) characterized by a consolidation of product offerings—as evidenced by many recent failed ventures, mergers, and acquisitions. Your enterprise integration solution should be the platform upon which you can build your long-term integration strategy. You will want to select a vendor who can provide you continuous support as you modify and extend your solution over time. Look for vendors with stable financial resources and a solid customer base.

Pilot Project

Pilot projects are highly advisable for major IT investments. The main function of a pilot project is to reduce the risk inherent in such an important decision. In the case of EI, a pilot project can reduce risk in many ways:

- Pilot projects allow you to validate your choice of EI tool.
- They allow you to test the performance of the EI tool in your own IT environment.
- They allow you to assess the team size and skill sets needed to work with the tool.
- They provide insight into how long a larger project will take.
- They tend to reveal challenges early, before those challenges delay a wider rollout.
- They allow staff to become familiar with the tool and document procedures that will be needed later on.

The challenge of performing a pilot is in the balance of selecting a project small enough that you can complete it quickly and for a minimum cost, yet one that represents a realistic scenario that will demonstrate whether the EI product suits the needs of your business. An effective pilot project will include several diverse scenarios that challenge the EI solution to demonstrate its flexibility and ease of use, as well as whether it integrates seamlessly with internal applications and those of your key partners and customers.

Once you've decided on the scope and target of your pilot project, you need to determine how to assess the effectiveness of both the pilot and the product after the project is over. To that end, you need to closely monitor and document statistics, such as development time and expenses, as you carry out the pilot project. If you are using consultants for your pilot project, it is essential that your team work with them and keep close track of the personnel used and the hours logged. You should also track what parts of the project are done on-site and what parts have been brought in already completed by the consultants. This close tracking will allow you to make the most accurate cost calculations for a full-scale deployment.

Implementation

After you have validated your product selection through a pilot project, you will be ready to develop and implement the solution in a production environment. But while implementation is a major milestone, it does not represent the end of the process. Implementing your EI solution will be an ongoing process of modifications and extensions. As your company seeks to become even more efficient and agile, new EI projects will surface and be identified. And as business processes evolve, your EI solution must also evolve to ensure it provides the integrated infrastructure to reflect those changes.

You will also want to consider how to leverage your EI solution across all the business units of your enterprise. EI solutions are frequently initiated by individual business units that are proactively seeking solutions to their integration challenges. Your company can maximize its investment by leveraging this EI infrastructure across the enterprise. Finally, once you have achieved an internal integrated IT infrastructure, you may want to include B2Bi capabilities in your environment. If you've chosen your EI solution correctly, you can make B2Bi connections with partners, clients, and suppliers more quickly and flexibly to enable the execution of truly comprehensive and integrated business processes.

Conclusions

Despite the focus on integration in IT for the last several years, organizations remain largely unintegrated. Systems function as information silos that do not easily share information with other systems. Data that should travel effortlessly from one system to another must be shuttled through laborious and error-prone manual processes. From a business point of view, these communication gaps cost enormous amounts of money in resources, time, and lost opportunities. They also stand in the way of achieving those strategic visions that rely so much on the smooth operation of the organization as a whole, and not just its constituent parts.

EI software can bridge these gaps. The right EI solution provides a mechanism for your applications to communicate, includes tools and services that allow you to mold the integration to suit your company's own distinct business processes, and offers you the flexibility to modify, update, and extend the solution to accommodate changes in your processes and corporate strategies.

The EI product you choose will have an enormous impact on the success of your integration efforts. Be discriminating in your selection of an EI solution, keeping the selection process—and your criteria—in mind:

- Set your business and product-related objectives. Don't forget that integration isn't just about bridging applications—it's about your business processes, too.
- Determine what you require in an EI product to meet your objectives. Ensure that you consider capabilities such as speed of deployment, overall cost-effectiveness, and flexibility, as well as characteristics such as scalability and reliability in the overall evaluation.
- Reduce your risk by executing a pilot project before committing yourself to the entire solution. Test the system to be sure it can meet your performance requirements.
- Consider that your EI implementation is an ongoing process: start with an initial integration project and then build from there. Since your business will continue to evolve, your EI system must be able to evolve with it. You want an EI system that will allow you to integrate future applications and processes, both within and beyond your organization.

The new generation of EI technology incorporates an information-processing model based on XML and Web services that has the potential to affect almost every aspect of computing. Just as Web servers and browsers facilitated the explosive communication of information among people, information technology based on XML and Web services will facilitate the proliferation of automated and distributed interactions among applications and processes. XML applies a simple, open model to the structure of information that frees it from any functional dependency on the software that operates on it. Web services provide the first truly workable architecture for building complex interoperable business processes over an unbounded network. When combined and supported within the framework of a robust EI platform, these capabilities provide the foundation for the next generation of truly interoperable applications.

However, there is nothing futuristic about this technology. It is very real now and can be applied to immediate requirements where a direct and quantifiable return on investment must be demonstrated. The ultimate value of EI technology is in providing solutions to the issues of the moment while at the same time addressing the needs of the future.



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