EXECUTIVE SUMMARY

Businesses are looking to improve both communication and collaboration with their trading partners throughout the trade life cycle: from requisition to settlement. This is true across the trading partner spectrum, regardless of the size of the trading partner (be it a small, medium, or large enterprise) or the type of technical infrastructure. Automating the exchange of business documents and data, along with integrating this information to back-end systems, brings benefits to both sides of the trading equation, helping buyers and suppliers. Such benefits include:

- Improved trade efficiency
- Superior customer service
- Enhanced bottom-line profitability

Simplifying inter-company processes while meeting the trading requirements of partners is key to managing the trade life cycle. It is equally important to reduce the complexity, error, and cost inherent in the customer-specific movement of goods (and the transactions associated with them) across multiple channels. Collaboration and integration also facilitates the sharing of information between trusted trading part-

PAYOFF IDEA

There are many key steps involved in deploying a successful, collaborative E-commerce solution. It is of primary importance that an organization understand its customers’ requirements, and develop online business processes and solutions that exceed their specific goals and objectives. Another important element is to integrate mission-critical business applications across the enterprise. This article shows that blending virtual and physical channels with the disparate systems that support these channels is what will keep customers returning to a Web site. In addition, leveraging all of the facilities available to deliver value to customers ensures maximum value to the enterprise.
ners, as appropriate. This is accomplished by enabling businesses to cost-effectively integrate, automate, and collaborate with their trade partners.

Organizations can improve trade efficiency by planning for the thoughtful inclusion of legacy integration into any collaborative project. This is a minimum requirement for minimizing both cost and risk on an ongoing basis. By following the methodology outlined in this article, businesses can rapidly integrate their internal systems with external trading partners in as seamless a manner as possible. It is important to remember that the trade life cycle should not be architected as a one-time event. Rather, because business partners change over time, businesses must support a framework that takes into account the evolving nature of trading partner relationships.

Organizations can achieve superior customer service via facilities for trade partner communication, and by appropriately sharing information across the trade management life cycle. This not only helps ensure the highest levels of customer satisfaction, but it also helps business partners share information for their mutual benefit, while conforming to demand and supply chain programs such as vendor-managed inventory (VMI), quick response (QR), collaborative planning forecast and replenishment (CPFR), and others.

In addition, when large, medium, and small businesses can trade friction-free with all their partners, their bottom-line profitability is enhanced. By automating manual business processes, such companies save money by eliminating the high cost of manual interaction from the transaction. Organizations can also reduce cost and enhance profitability by leveraging their investment in the electronic data interchange (EDI) infrastructure across the entire trading partner community, while helping small to medium enterprises (SMEs) support the requirements of their larger trading partners.

INTRODUCTION
The evolution of enterprise resource planning, supply chain management, customer relationship management, and other enterprise systems is on a collision course with the revolution in collaborative commerce systems. In fact, E-commerce systems are quickly morphing into mission-critical trading partner collaboration systems. In addition, the somewhat arbitrary lines drawn between front- and back-end systems is disappearing as all systems attempt the move to the front end.

Organizations and their software vendors are utilizing various strategies to open up these systems to the virtual, real-time, Web-based environment. There are two key issues that must be addressed. The first is what applications and data to expose. This is dependent on the goals of the organization and involves a function-by-function review of existing solutions. The second issue involves the fact that existing client/server enterprise systems were at best architected to handle thousands of users,
whereas Web-based systems are designed to support tens of thousands, if not hundreds of thousands of users. The end result is most likely to be a phased strategy that exposes appropriate functionality and data over time. Leveraging proven business systems and best practices through a process of enterprise integration allows E-commerce systems to act as the Web-based hub for the transaction of online business.

Enterprise integration is not new but rather a process that organizations continually utilize as they grow and evolve. Some obvious examples are the move from paper-based systems to the computer, from the host-dominated environment to client/server, and, most recently, from back-office systems to the Internet. This constant movement reminiscent of the video game title "Skate or Die," although in this case it is a question of "evolve or die." Online commerce and real-time trading partner transactions are not a fad. The pace of change will only accelerate as organizations, including one's competitors, discern innovative ways to attract customers and communicate with partners to deliver products more effectively.

For many enterprises, it has become more complex to provide the highest levels of customer satisfaction, while minimizing the order-fulfillment-payment cycle. While everyone wants to move from the traditional buy–hold–sell to the sell–buy–ship model, this is not always practical or achievable — especially in the short term. A minimum requirement is the tight functional integration of all partners involved in a trade. This includes merchants, suppliers, buyers, and the firms that move goods between these organizations. The key to overcoming the obstacles that reduce the effectiveness of collaborative systems is to bridge the virtual and real world of operations and execution. This means developing a strategy that integrates an organization’s front- and back-end systems, not only with each other, but with appropriate external systems as well.

Enterprise integration with online services begins with business processes. This includes, at a minimum, order/sales management, manufacturing, distribution, inventory, logistics, and financial systems. Without integration, a business cannot effectively respond to customers’ order status requests, whether that be via the Web, an account rep, or a customer service rep. For example, unless organizations integrate, they cannot initiate returns online for orders not placed on this medium, and customers cannot return goods purchased online via a different mechanism. Customer billing becomes a problem or requires manual intervention, and the same inventory might be erroneously allocated or reserved for multiple purposes.

INTEGRATION GUIDELINES

Solving the above problems involves aligning business processes and getting applications that work well in isolation to work well in tandem. That is, all enterprise applications need to collaborate as a seamless, in-
Newer online commerce customer interaction systems and back-office enterprise resource systems need to interoperate as if they were designed together. The bottom line for an organization is being in a position to exceed the goals and objectives of its customers, regardless of the medium used to interface with the company.

Because the same information is often maintained or duplicated across several systems, individuals must access different systems to get answers to the same questions. At a minimum this is troubling, and in most cases results in faulty, inconsistent information being communicated across the business and to customers. Inefficiencies, excess costs, and unoptimized operations are a few of the resulting consequences. With the aggressive implementation of E-commerce solutions, these issues are compounded and become more complex to resolve. Exhibit 1 lists just some of the key pieces of data that are representative of this problem; it does not take much imagination to visualize the resulting problems and inefficiencies.

Inventory availability is a good example. The application responsible for actually maintaining inventory positions and the applications that report inventory positions (on-hand amounts, for example) must be synchronized. This becomes an increasingly difficult problem to solve the farther removed the application is from the data. It is challenging enough to synchronize applications operating inside the firewall. However, Web-based, E-commerce applications that are outside the firewall, as well as

### Exhibit 1 — Key Pieces of Data Influencing E-Commerce

- Inventory availability
- Account status
- Inventory status
- Order status
- Order details
- Shipping details
- Pricing
- Credit limit
- Returns
- Product details
- Configuration
- Payments
- Customer defaults
- Promotions
- Credit history
- Quotes
- Contract details
- ACLs (access control lists)
- Shipping status
- Discounts
collaborative processes with trading partners, need much closer attention. Issues of transaction integrity, interfaces, and communication facilities all impact the goal of real-time synchronization.

Channel synchronization is the term used to describe the harmonious interactions of business and system processes across the enterprise. Regardless of the customer touch point, it is imperative for a business to know who the customer is, all of the business transacted, and the value and relationship of this customer to the business. In addition, and most important, the business must be in a position to efficiently satisfy the customer’s next request. This might be online, through a call center, EDI based, or via an account representative visit.

Because the rules of business in the digital economy are immature and evolving, enterprises must remain flexible and be able to adapt quickly. Planning, execution, and measurement are as important as ever, but it is no longer sufficient to do this in isolation without taking into account the multiple channels utilized to take orders, communicate with customers, and fulfill orders. The organizations that will be successful in this economy are the ones that effectively and seamlessly blend the physical and virtual initiatives, both internally across the organization and externally to trusted trading partners. In addition, it is critical to examine existing business practices and, wherever possible, utilize the advantages provided by the virtual environment.

The virtual enterprise must have the ability to rapidly adjust old business processes to remain successful. The virtual enterprise moves fast to create and seize opportunity — doing more for less and creating competitive advantage. Virtual enterprises conduct business activities collaboratively, with suppliers, customers, and business partners. Virtual enterprises can conduct commerce with business partners online, tailoring offerings to specific customer needs. Most important, virtual enterprises leverage the physical environment by effectively integrating the systems and business process into a seamless whole.

Headlines and stock prices boldly illustrate the fact that this new business environment waits for no enterprise; business processes that are efficient today may not be efficient in six months. Established, successful companies face competition from traditional as well as newer online-only enterprises. The virtual business environment of the dot.com offers compelling lessons, both good and bad, from which other companies should learn. Blending the best practices of this business model with the existing infrastructure and relationships offers customers and partners best-of-breed services, while providing the business with a host of efficiencies.

As mentioned previously, any enterprise that expects to be successful must understand and address the issues of channel synchronization. Because this is fundamentally an issue of integration, there must be integration and communication between front/back-end electronic commerce
and enterprise systems, such as enterprise resource planning (ERP), supply chain, manufacturing, sales-force automation, financial, call center, and customer management, as well as the systems of trading partners. This includes customers, suppliers, financial institutions, and logistics/transportation partners. The issues are not trivial but the opportunities for those organizations that succeed are enormous.

COLLABORATION AND THE ENTERPRISE

As more and more businesses realize the mission-critical nature of Web-based collaborative commerce, it becomes critical to establish an infrastructure (software, hardware, and services) capable of supporting this model. The E-commerce hub is the nucleus of an integrated, channel-synchronized enterprise. The hub provides order management, product merchandising, account management, customer service, and fulfillment facilities to customers. It also serves as the communications focal point between a business, its suppliers, and other partners (i.e., logistics).

Interfaces to internal and external systems also need to be coordinated through the hub. Finally, the E-commerce hub acts as a key repository for both customer and order-related information (including fulfillment). Exhibit 2 illustrates the interactions of an enterprise E-commerce hub. Several key transactional interactions and integration points are included. While the diagram is not exhaustive, it does illustrate the mission-critical nature of the information flowing within and between organizations.

The E-commerce hub or trading exchange offers the potential of greatly expanding Web-based commerce transactions between trading partners. Intelligent buyer–seller, seller–supplier, and logistics transactions need to be defined to determine the appropriate functionality, interface points, and communication services. Interfaces and functionality need to be looked at from the pre-order, order, and post-order perspectives. This includes product merchandising, account management, and order management.

Pre-order functionality encompasses registration/trade partner management, pre-order notifications, sourcing management, RFQ/RFI (request for quote/request for information) matching and turnaround, credential services, demand management, calendar services, and document management. Post-order services encompass inventory, warehousing, pick/pack/ship, shipment track/trace/status, acknowledgments/alerts, customer support/self-service, invoice-payment management, and performance measurements. Both pre-order and post-order cases require interfaces and a transactionally sound messaging infrastructure to ERP, customer relationship (including call center), supply chain, financial, sales-force automation, and other enterprise systems.

It becomes difficult if not impossible to conduct business if everyone is not utilizing the same up-to-date information. Account reps must have access to the same data that customers are accessing over the Web, and
this information must synchronized with the back-office systems that also utilize this data. Cross-functional information such as product pricing, account status, inventory levels, order status, and customer credit information are key integration points.

One can look at several specific examples. Customer account information can be managed by a financial application. Account balance, credit history, and credit limits are used by front-end collaborative applications, call center personnel, and account reps. A client should not be able to order a product online when an account or customer service rep would deny the order due to a credit problem. Inventory information can be managed by an ERP application. Information regarding recently allocated inventory no longer available for client purchase should not be offered to clients, regardless of the point of contact.

Order status is another example of key data that needs to be synchronized across front- and back-end applications. If a client visits a Web site to cancel an order, account and customer service reps (not to mention ERP/inventory systems) must have access to this information to revise inventory reservations and shipping/billing status. The returns process, initiated over the Web, must be integrated into the physical system that will deliver this inventory back to the warehouse. In all of the above cases, accurate information that has been integrated across the enterprise leads to better customer service and a more efficient operation.
Many integration points are required to ensure that a Web-based order is properly initiated, managed, and delivered. This is only possible in an enterprise-commerce-enabled business where front- and back-end systems have been integrated. The order management process requires ERP, supply chain, logistics, financial, and customer relationship (including call center) systems integration. In addition, integration with trading partner systems is required if, for example, pricing, logistics, or products are the responsibility of a third party.

The messaging services required to support the integration of front- and back-end systems is another key consideration. Transactional integrity, queueing, transport middleware, and messaging semantics are a few of the facilities required. Because transactions can fail at any point, it is important to ensure that notification and rollback services are available. Multi-threading, managed for each transactional request/reply pairing, is also a requirement for reasons of both performance and scalability. A publish-and-subscribe mechanism is desirable to ensure that all appropriate people and systems are notified when a relevant business event occurs. Subscription to publishable events needs to be registered for reasons of security and control. In addition, subscriptions must be bi-directional: from the E-commerce hub to the back end, and from the back end to the E-commerce hub.

Once a secure, high-performing messaging infrastructure is in place, it is necessary to define the content and syntax of these transactions. These semantics are best implemented via a well-recognized standard that is adoptable within the enterprise and supported by trusted trading partners. Viable alternatives include EDI (value-added network or Web based), one of the emerging XML standards, or a specific vendor’s interface, depending on the specific circumstance.

A variety of industry standards (both vertical and horizontal) that define the informational flow between systems and trading partners are in varying forms of development. While none of these has yet reached market acceptance or momentum, it is important to watch these trends. In general, these standards offer the potential of simplifying the order, fulfillment, and tracking process across both systems and companies. The goal is simply to define a set of transactions that both systems and trading partners can utilize to more readily interoperate.

**CONCLUSION**

There are many key steps involved in deploying a successful collaborative commerce solution. Most important is understanding one’s customers’ requirements and developing online business processes and solutions that exceed their specific goals and objectives. The second most important element is integrating mission-critical business applications across the enterprise.
Comprehensive integration allows systems to seamlessly exchange information without human intervention. After internal applications have been integrated, trading partner systems must be considered.

While many companies declare success when they simply attract customers to the Web, in reality, this is just the beginning. Blending virtual and physical channels and the disparate systems that support these channels is what will keep customers returning. Customers expect the same high degree of personalized service, regardless of the touch point and service required. This means ensuring that all systems are working in unison. Leveraging all of the available facilities to deliver value to customers — virtual and physical — also ensures the delivery of maximum value to the enterprise.

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