

SYSTEMS DEVELOPMENT MANAGEMENT

COLLABORATIVE INITIATIVES: SERVICE LEVEL MANAGEMENT, QUALITY-OF-SERVICE (QoS), AND PERFORMANCE MEASUREMENT

Steve Rabin

INSIDE

The Internet; Electronic Commerce; B2B Service; Management Plans; Metrics

Businesses are being constantly bombarded by messages describing the unique opportunities presented by the Internet and the availability of mature collaborative solutions. However, to successfully capitalize on this opportunity, the risks associated with business and technology change must be properly managed, and the substantial investments in existing enterprise systems must be leveraged and protected.

Despite the ups and downs, the Internet has proven to be a significant channel for business-oriented commerce. Activity levels are ramping up and revenues from online sales are growing accordingly. This trend will accelerate as businesses continue to understand the merits and leverage the benefits of this channel. Collaborative business interactions and the automation of manual trading documents (POs, ASNs, invoices, etc.) are providing the

PAYOFF IDEA

Changing business processes offers both opportunities and pitfalls. Those businesses that exceed customer requirements while anticipating the demands placed on the business and infrastructure will put themselves in a very strong competitive position. A service level management plan is one of the key pieces toward ensuring that the business operates consistently across the spectrum of Internet collaborative activities. To communicate results and maximize success, performance measurement and feedback must be an integral part of the collaborative mix.

foundation for businesses and associated trading partners to successfully interact online. In addition, XML-based transaction semantics and the morphing of electronic data interchange (EDI) are helping to fulfill the promise of true business-to-business (B2B) collaboration. Market leaders are harnessing the power of the Internet because of the revenue potential, customer service opportunities, and operating efficiencies offered by this medium.

Success does not come without problems. In fact, the greater the success of an E-commerce initiative, the greater the challenges. High transaction rates, unbounded page requests, concurrent usage, security, and constrained back-end system integration are some of the problems that occur. Collaborative business initiatives are inherently complex, both technically and from the business perspective, and must provide trading partners with a reliable, secure, intuitive, and efficient environment.

The importance of the above factors must be recognized by businesses as well as addressed by solution providers. Solution providers include software vendors and Internet service providers, including both internally managed and outsourced solutions. Corporations hosting their collaborative initiatives need to master new software and hardware technologies to meet the technical demands of the enterprise-owned implementation. Organizations turning to professionally managed outsourced services must be sure to select a firm that understands the needs of both the business and its clients. Internally managed and outsourced solutions are both appropriate, depending on the expertise and resources available. Equally important is the ability to measure the success of the implemented solutions, internally and across the trading community (vendors, customers, and trusted third-party partners).

Recognizing the depth of these challenges is important for several reasons. First, establishing the information flow with trading partners is inherently complex. After a reliable infrastructure for doing business with partners is in place, a trading partner activation program must be established. Building a sustainable transaction flow is key to achieving a state of efficient flow between various collaborative participants.

Think critically about the investment required to sustain your collaborative B2B business ventures. Because the Internet is not managed, bandwidth along with a variety of other operations management expertise are required. Internet operations are mission critical and affect a company's bottom line and ability to communicate with its clients and partners. Ensuring the quality, reliability, availability, and redundancy of the Internet operation requires a substantial investment in state-of-the-art software, facilities, and networks that are monitored and managed every day (24 × 7) by experts. Implementing a best practices operations environment, and defining the rules that will govern the site's service levels, are critical to the long-term viability of the online operation.

Regardless of whether the implementation is internally or externally administered, a service level management plan is required. This plan defines the quality and levels of service provided through the infrastructure and delivered by the site. It must be developed in conjunction with both business managers and IT professionals to ensure that the goals of the online business are met. This plan, owned by the commerce business manager, should be viewed as the contract defining how the professionally managed site is administered.

There are many factors that must be included in the plan, including issues of performance, redundancy, replication, and disaster recovery. These factors express the level(s) and quality-of-service (QoS) the site provides to its customers. The plan also defines the recovery mechanisms and procedures should the site experience problems. It is also important to understand and ensure that remote maintenance and reporting requirements are included. Remote, browser-based maintenance allows business and systems professionals to view activity and administer the site from anywhere in the world the Internet can be accessed. Reporting provides information as to the characterization of the load throughout a given time period, as well as associated dynamic feedback.

Service level management plans have been implemented by companies large and small, and from both the business and consumer sectors. While these plans can be developed internally, it is often useful to consult a professional with experience in the operational execution of an E-commerce site. The expense of this service is trivial compared to implementing a plan that does not include key issues (such as disaster recovery and peak load handling).

Once finalized and implemented, the plan should be reviewed on a periodic basis, no less than every six months. Site activity and the services provided change over time, requiring a review of the basic assumptions from which the plan was originally designed. If the current infrastructure does support the future, then contingencies and thresholds need to be put in place. Be sure a performance regression test on all application changes is part of the agreement. In general, it makes sense to run a performance regression test on a regular basis (e.g., quarterly), regardless of changes to the site.

The best management plans are developed by well-informed business and IT professionals who understand the goals, objectives, and requirements of the site. While the goals and objectives are often business oriented, requirements are often system oriented. For example: How many pages need to be served in a given period? Are the pages simple (static) or complex (dynamic)? What types of front/back-end services will be utilized to satisfy site visitors (consumers and business partners)? Consider the following when determining the load that will be placed on the site, and the corresponding infrastructural requirements:

- Revenue per period
- Transactions per day
- Concurrent users
- Pages viewed per order
- Average dollars per order
- Pages viewed per visitor
- Transaction ratio peak period

These figures need to be converted into metrics and used to identify required service levels within the agreement:

- Dynamic to static pages
- Transactions per second
- Pages viewed per day
- Pages per second
- Acceptable downtime

Keep in mind that the higher the level of service required, the greater the expense in terms of dollars, professionals, and hardware/software resources. Maintaining a high level of service in terms of response time, uptime, and reliability comes at a price. Because many of the above components are unknowns, best guesses need to be made based on anticipated loads, competitive site experiences, and industry statistics.

The best service level plan is only as good as the cooperation and sharing of knowledge between the operations and business parts of the business. A cost/benefit analysis of new features versus performance should be performed on a regular basis, especially around anticipated periods of peak load. Legacy connections and back-end transaction loads also need to be accessed and accounted for. Operations and system professionals must ensure that customers obtain the same performance regardless of the location from which they are connecting.

Should problems arise, specifying how the site will deal with heavy traffic and peak load periods minimizes finger-pointing and conflicts, as well as identifying contingencies and alternatives. Determining how reliable the site is (in terms of connections refused, connection timeouts, and page timeouts) must be well understood and defined.

Plan for success by designing scalability, recovery, and flexibility into the infrastructure and operations management plan. Beware of the allure of high bandwidth or excessive amounts of hardware and carrier services. It is not necessary or advisable to oversize the infrastructure upfront because this does not necessarily make things work faster. Collecting and analyzing data leads to more information and smarter decisions. Defining and building operational procedures ensures consistency between the business, operations management, and customers. Plan for,

communicate, and adjust for special events (such as holidays, special promotions, business shutdowns, etc.).

Once infrastructure issues have been settled, the real work of collaborating with trading partners can begin. In fact, when it comes to trading partner collaboration, it does not matter what the question is because the answer is always: “your supply chain.” Achieving lower costs, shorter lead times, higher accuracy, and greater information flow requires that supply chains evolve toward more and more integration. In fact, the ideally balanced supply chain operates as a single organism, delivering value by integrating processes and removing barriers between functions, product movements, and companies.

Determining a set of metrics and then collecting the associated measurement data is the best, least subjective way to analyze program performance. Because conducting trade between business partners is more than a singular exchange of documents, metrics are specific to the trading goals of each enterprise. There are a myriad of interactions encompassing relationship, negotiation, commerce, and content. Performance measurement may also be domain specific and include, for example, supply chain, customer service, or financial-based metrics.

Moving from simply connecting with partners to active and ongoing collaboration requires a business model that supports and adapts to the individual requirements of trading partners. This is complex because trade partners come in a variety of sizes. The same large buyers that purchase goods from billion-dollar suppliers also purchase goods from small regional suppliers. This disparity in size creates significant problems for buyers and suppliers alike. While the trade life cycle remains the same regardless of partner size, the methodology of communicating with each partner varies.

What this means is that the metrics used to measure performance must be flexible to take into account the diverse nature of the dynamics of the trading community. Because enterprises have a multiplicity of trading channels, trading partners must maintain multiple business rules. Pricing, inventory, delivery, seasonal promotions, and the exchange/turnaround of business-document-associated interactions also requires careful attention from the metrics perspective.

The management of inter-enterprise transactions and the flow of goods can be daunting and result in serious business problems — poor customer service, lost information, data entry errors, and slower manual business processes. This underscores the importance of measuring the consistency of the supply chain experience across varied customer types and logistics providers. It helps to reduce the complexity involved in achieving the cost-effective management of trading relationships if a company determines which vendors deliver product on a timely basis, in what regions of the country order errors are highest, and who does not comply with collaborative mandates.

The collaborative sharing of performance information can benefit the entire trading community. Building a sustainable transaction flow is key to both achieving a state of efficient flow between collaborative participants and collecting enough data to be statistically meaningful. The greatest barrier to transaction liquidity is the difficulty in getting trading partners connected and ready to exchange documents. Partner activation should not involve complex implementation requirements or technical inconsistencies. The enterprise must be able to articulate a reasonable value proposition and technology plan that cost effectively addresses the issues of collaborative integration and automation.

The best way to address these issues is by defining a joint implementation plan — with executive sponsorship and management accountability. This plan should not be overly complex and should include the definition of performance measurements. Performance metrics and the ability to measure the success of the collaborative effort are key to the ongoing project. While the metrics (such as forecast accuracy, delivery performance, and cycle times) will differ by organization and trading partner, the critical issue is that the data be available for analysis.

Metrics are valuable to all sides of the trading equation and can be used as both a carrot and a stick. Offering partners a controlled view into the trading relationship is a powerful inducement because of the cost and customer relationship implications. Predictive performance models allow the published metrics to help anticipate and plan for the future. These same metrics can also be used to validate critical issues and their potentially negative impact on the relationship.

Companies have been measuring the performance of their operations for quite some time. Extending this measurement into the realm of collaborative, inter-enterprise operations is challenging. This is because it is difficult to know if the right things are being measured and what the performance targets should be. Metrics must be established that are appropriate and realistic to the process and collaborative participants. Customer service, procurement, logistics, and distribution must each be measured independently. It is ineffective to use generic metrics (such as if sales are up or down) to measure the performance of a specific operational discipline.

The art and science of choosing performance goals is tricky because it involves the often conflicting nature of departmental goals. For example, procurement may be measured on a cost-per-unit basis with vendors. While this drives down costs, it also negatively impacts warehousing operations with excess inventories. Similarly, logistics departments may have incentives to work with transportation partners to ship on a full-truckload basis. This results in logistics efficiencies, but only at the expense of on-time deliveries. These issues do not minimize the value of collaborative performance measurement, but they do point out the complexities involved.

As companies become more integrated and externally focused, metrics can help drive strategic change across the trading community. Electronically connecting with partners allows firms to operate more closely. This virtual enterprise represents a supply chain that is highly integrated and acting more like a single organism. In this case, measurements can help identify if:

- *The collaborative relationship is being leveraged beneficially* — for my enterprise, or for my trading partner's enterprise
- *Costs are being reduced* — from the operations, overhead, and material perspectives
- *Collaborative partners are more responsive than traditional partners* — that is, customer service has improved or errors have decreased

At the end of the day, financial performance will dictate the success or failure of collaborative initiatives. Data collection, analysis, and the comparison to defined performance metrics will determine how to proceed — and even if to proceed. Partner automation and integration provide the visibility to understand the actual effect on the enterprise.

As previously discussed, there are a variety of supply chain performance indicators that can be measured. This assumes that the appropriate data is being collected and submitted for analysis. To ensure that enterprise and departmental goals are being balanced, it is necessary to include measurements that take both into account. This includes, for example:

- *Delivery performance*: requested versus actual dates at the line-item level
- *Cash-to-cash cycle time*: measuring the time it takes to close the loop between funds utilization (material acquisition) and collection (invoice payment)
- *Pay on receipt*: measuring the time required to match and reconcile invoices
- *Material availability*: the number of days required to achieve a sustainable increase in production
- *Total supply chain costs*: the total cost, as a percent of sales, to manage order processing, acquire materials, manage inventory, and manage supply chain finance, planning, and MIS costs
- *Order accuracy*: products delivered vs. what was ordered
- *Replenishment*: the time it takes to replenish inventory and the accuracy of the replenishments
- *Demand management*: SKU ordered versus what was forecast
- *Customer service level/fill rate*: items available in stock for delivery per purchase order

These metrics represent different aspects of the supply chain. When they are viewed holistically, a significant reduction in costs is achievable if trading partners can work together to identify areas of improvement and increase efficiencies. The key to this involves automating, integrating, and then monitoring trading partner processes and the associated exchange of trade documents and data.

Studies have shown that an effectively managed collaborative supply chain can save a \$600-million company as much as \$42 million annually. For example, companies operating in collaboration function with as much as 60 percent fewer inventory days than nonaligned competitors. Lower inventory means more working capital. Collaboration can also produce reduced lead-times and decreased cycle times. This leads to an advantage in “cash-to-cash” cycle time.

Knowing how to work with and measure the effectiveness of trading partners also allows the best suppliers and logistics partners to be used on a go-forward basis. Quality, delivery performance, costs, and service can be evaluated, resulting in a reduction of partners and associated material acquisition costs. Changes in customer demand can be met with less disruption. Finally, performance analytics can be used to measure and help iterate plans. This allows companies to become even smarter about how they interact and where further efficiencies can be derived. The end result is reduced inventory costs, better customer service, and improved cycle time and fill rates.

All of these benefits are quantifiable but can only be achieved by companies that have jointly defined processes and goals. This includes the collection of data necessary to measure those processes. Performance metrics do not in themselves result in savings, but instead point to specific initiatives that are successful or need tuning. A feedback monitoring mechanism is required to ensure that all parties are alerted when refinements are indicated. In this case, an event-based solution is best because it can be automated across the trading community and minimizes the amount of information that needs to be reviewed. Ultimately, a performance dashboard should be implemented that allows management to quickly and graphically review key metrics.

Collaborative performance metrics should be used to evaluate both the progress in implementing as well as the final results of inter-enterprise initiatives. Performance review must occur routinely by both general and departmental management. While senior management owns the overall strategic goals of the business, it is the actions of individual departments that make a collaborative relationship work.

A balanced set of focused metrics and the sharing of operational, planning, and performance information are the keys to successfully collaborating with trading partners. These new business strategies need to be consistently monitored and measured. It is also a good idea to implement collaborative programs in a phased manner. Select trading partners that

have a stake in the success of the program, and be sure to include everyone when determining what metrics to analyze and how to measure success.

Business activities are extending beyond the boundaries of the enterprise. Technology innovation, the Internet, and an awareness of the potential benefits are the primary factors driving this dynamic forward. Changing business processes offers both opportunities and pitfalls. Those businesses that exceed customer requirements while anticipating the demands placed on the business and infrastructure will put themselves in a very strong competitive position. A service level management plan is one of the key pieces toward ensuring that the business operates consistently across the spectrum of Internet collaborative activities. To communicate results and maximize success, performance measurement and feedback must be an integral part of the collaborative mix.

Steve Rabin is chief technology officer at eB2B Commerce, Inc.