Making Supply Chain Collaboration a Reality… Fast

September 1999

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Management Summary

> "Focusing on the value creation process in isolation from suppliers
> and customers is not sufficient."
>
> - Introduction to Supply Chain Management, Prentice Hall, 1999

Supply chain management (SCM) practices may very well represent the single most effective weapon that today's corporations can employ to create or extend competitive advantage in their markets. Manufacturers and distributors have spent years refining manufacturing efficiency and quality practices to the point where industry analysts estimate that the most efficient manufacturers will be able to elicit only another 2 - 5% reduction in costs from within the organization. With an average of 60% of product costs driven from outside of the corporation[1], companies are quickly turning their attention outward towards customer and supplier relationships as the most leveraged source of future improvements in expense reduction and profitability improvement.

On average, US companies now spend about 25% of corporate budgets on supply chain management, including inventory carrying costs, materials acquisition, transportation, order management, supply-chain financing, and related IT expenditures. Contrast this figure to the 12% spent by companies judged best-in-class[2] in SCM such as Dell or WalMart and the power of successful SCM becomes readily apparent - so apparent to corporate management, that improving supply chains globally was judged a major trend by 78% of 2,500 CEO's of companies with revenues greater than $100 million.[3] This sentiment was echoed in a recent survey conducted by Deloitte Consulting in which 91% of senior managers at 240 North American manufacturers ranked supply chain management as "critical to very-important" to their companies' success, yet only 2% rated their own supply chain as "world class."[4]

Collaboration with upstream and downstream partners can take many forms including mass customization to joint product development, shared forecasts, and co-location or other managed inventory practices. Historically, in make-to-forecast push manufacturing environments, inventory stockpiles in raw materials, WIP, and finished goods were used as a hedge against unexpected outcomes in everything from consumer demand shifts and yield problems, to delivery delays or assembly interruptions. With today's focus on product personalization and mass customization, shrinking cycle times, and the pace of technological innovation increasing the rate at which product obsolescence occurs, companies that do not act to minimize inventory held at every step of the manufacturing and distribution process are operating at a significant financial disadvantage.

As the Internet continuously accelerates the pace of business, companies must be both flexible and agile - able to react quickly, *with minimal effort and expense*. Most companies do respond and execute quickly,

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[1] Benchmarking Partners, June, 1999

[2] World Research Advisory Fax Newsletter – January 22, 1999

[3] Business Week, December 12, 1998

[4] "Slow Growth on the Supply Side", CIO, July 1, 1999

but too frequently this is achieved at a high cost - escalations charges, expedite fees, overtime pay - speed mandated by management, but not achieved through inherent capabilities of the organization and its supply chain partners. Simply increasing the speed of activities inside the corporation without concurrently increasing the visibility into what is actually happening only increases the risk of an organization actually doing the wrong things… albeit faster. Agility can be greatly increased by improving the ability to detect problems, threats, and opportunities, giving the organization and its partners more time to react. By implementing an "early warning system" that continuously monitors for important events initiated by partners, customers, or internal operations, a company can gain valuable time to evaluate situations and invoke responses before events turn into problems, or problems turn into crises.

The key to achieving agility in operational performance is managing information instead of inventory by reducing or eliminating communication latency - the unnecessary time delays between the occurrence of an event and when it is discovered by the organization and then subsequently communicated to the person able to take remedial or corrective action. Extending this capability to include instantaneous recognition of events or problems that must be resolved *across organizational boundaries* enables supply chain collaboration. This level of collaboration facilitates reductions in lead-times, inventory levels, stock-outs, and production interruptions throughout the supply chain while simultaneously increasing overall responsiveness to the end consumer.

By compressing timeframes associated with traditional internal reporting and notification cycles, companies can enhance productivity through improved awareness of business operations, more responsive management-by-exception practices, and shorter cycle times leading to cost savings through reduced inventory levels, escalation and expedite charges, and greater organizational efficiency. By extending to customers, partners and suppliers, companies can increase competitiveness and streamline performance across every facet of the business.

Given that more effective interactions with internal and external members of the value chain are fundamental to improved business performance, what can organizations do today to *quickly* derive improvements in financial results through supply chain management? This paper will present suggestions and examples that companies with varying levels of supply chain management expertise can apply to realize significant incremental benefit through technology-assisted techniques that drive costs down and improve responsiveness though increased visibility and reaction to (un)anticipated events within the supply chain.

Collaboration: Why the Hesitation?

Despite proven benefits, there are numerous companies that still have not initiated SCM programs due to an erroneous belief that such projects will inflict major disruption to existent business processes or require system replacement or re-engineering at tremendous cost to the organization before any beneficial results are achieved.

In a report by AMR Research, titled, "R*eality Check: Focus Group on Supply Chain Collaboration*" (April, 1999), AMR observed that while there is a strong desire to realize collaboration benefits, few companies have actually implemented a system to improve collaboration. While several issues or concerns were cited by the group as preventing them from pursuing collaboration, two in particular deserve attention because of misconceptions which create artificial resistance to undertaking a potentially lucrative SCM project:

- Supply chain collaboration requires a technology-based solution similar in scope, cost, and risk to an ERP implementation:

  "Users are confused and believe collaboration is a big deal . . . The task appears daunting to them, and they fear it will further convolute an already complicated set of business practices currently in place with trading partners . . . They believe silver-bullet technology needs to be developed before they get started."

- All partners must be technological equals before an SCM project can be initiated

  "The focus group participants believed in the benefits of collaboration, but were concerned whether trading partners would jump on it. . . It would be difficult to electronically collaborate with suppliers and customers on a broad basis, according to one participant, since all trading partners are not at the same level of technological sophistication."

AMR Research goes on to emphasize that rudimentary collaboration already exists between trading partners using ubiquitous business communication methods such as email and fax:

  "Few [respondents] are willing to admit they already do a fair amount of collaboration with customers and suppliers in the form of sales calls, phone calls, e-mails, Electronic Data Interchange (EDI), and even postal service. To them, such communication methods do not appear sophisticated enough to be termed *collaboration*."

Small Steps, Big Results

Given the belief that collaboration can be implemented incrementally between companies whose IT capability are not perfectly matched, what are the next logical steps beyond phone, e-mail or fax transactions which will yield the maximum result in the shortest timeframe with the smallest investment? Significant gains are being made by companies that are able to identify and reduce "time-to-awareness" for existing business processes that play a role in the most common pain points within supply chains:

- Lost sales due to stock-outs or inappropriately located inventory

- Excess finished, WIP, or raw materials inventory levels

- Excess total cycle times to customer delivery

- Unacceptable levels of discounting or write-offs for no-move or obsolete inventory

The greater an organization's visibility into its operation and the longer its time to respond to events, the greater the potential to free cash tied up in excess inventory levels tied to the above problems. The challenge then becomes improving the ability of the organization to quickly identify specific recurring situations or events which, the sooner each occurrence is recognized and addressed, can positively impact overall performance. The fastest and easiest way to accomplish this is to minimize latency in *existing* business reporting cycles by eliminating obvious and unnecessary time delays in recognizing and communicating key events.
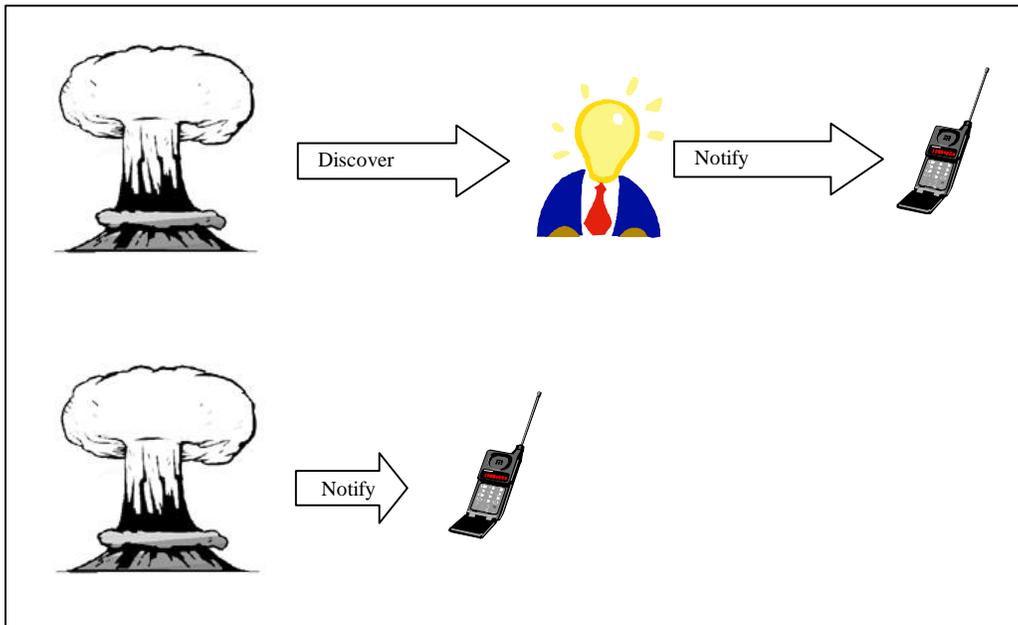
Figure 1: Compress the time between when an event happens and its discovery by
eliminating secondary notification delays through automatic and direct notification of
appropriate personnel.

Most organizations today rely on traditional reporting tools, a combination of periodic batch reports and
ad hoc queries to deliver operational status information. Increasing sensitivity to events by decreasing the
time intervals between batch reports will accelerate recognition of key events or situations by the amount
of time cut between reporting cycles, but with the added opportunity cost of additional employee hours
diverted to read and review the incremental report output. This approach is susceptible to human error
and also cannot improve the other half of the latency equation, the time that lapses between when
someone in the organization becomes aware of the event or problem and when *the right individual or
group* (the problem solver or decision maker) is made aware of the event.

Work Order Management	If the duration of an open work order slips, alert Operations to re-allocate resources or re-route jobs to meet production time schedules
Process Control Tolerances	If quality control standards and tolerances are not being met notify QA, Maintenance, or Engineering
Material Movement	If materials required for manufacturing operation do not arrive at a work cell before safety stock is broached, alert Operations
Delivery Monitoring	Alert Traffic or Expeditor if scheduled JIT inventory delivery is more than "n" minutes late
Equipment/Vehicle Maintenance	Alert if scheduled preventative maintenance "lock-out" does not occur
Product Obsolescence	When individual products have been held in inventory past a time threshold, alert to possible excess-no move-obsolete situation
Inventory Management	Initiate replenishment cycle immediately upon material levels hitting a ROP
Quality Conformance	Alert Purchasing and Engineering if a materials delivery fails incoming inspection
Planning Forecast Review	Alert Planner if forecast received is n% off of expected

Consider the effectiveness of monitoring the above situations using traditional reporting techniques. Wouldn't it be more efficient to instead eliminate reports with their associated production delays and review times in favor of a solution which would decrease time to organizational awareness, free-up employee hours formerly spent reviewing reports, and also eliminate the lag time to subsequently notify the right person or people about a situation that requires their immediate attention? Quantum Corporation took this approach in streamlining supply chain operations at its tape drive facility in Colorado Springs. By substituting a business event detection and notification system for traditional report-based processes, Quantum was able to not only achieve its target objectives but also reallocate analyst cycles away from reviewing reports to more productive activities:

> "This straightforward application reduced report analysis by automatically delivering key metrics to business analysts as they occurred, rather than in weekly reports. This implementation has saved each analyst between two to three hours each week, and data accuracy has improved to over 99%. In addition, it allows Quantum to identify and improve the business process."
> - Rob van Herk, Senior Business Systems Analyst Manager, Quantum Corporation

KPI Monitoring

Organizations are using key performance indicators (KPIs) to monitor and measure not only supply chain performance, but all aspects of the business from finance to the shop floor. By setting tolerances for key aspects of the operation, workers and management can focus on business, periodically checking KPIs to determine whether adjustments are required to maintain progress against objectives. By automatically monitoring KPIs, organizations eliminate employee cycles spent proactively checking these values and also improve agility by instantly alerting the appropriate individual(s) when a KPI value is out of range so that corrective action can be taken immediately. Carpetland International, has experienced dramatic business benefits by reducing its reliance on paper reporting in favor of business event detection and notification technology as the basis for a management by exception initiative within the corporation. By initially focusing attention on managing KPIs just related to inventory levels and discounting, Carpetland was able to deliver improved profitability in less than ninety days.

> "Retail business is detail business. And details are the problem and the opportunity. Before Categoric, we worked in the traditional way - lots of systems, lots of reports, lots of paper, lots of errors and lots of time. Categoric Alerts allow us to manage by exception, giving us an enormous competitive advantage. We can manage our business the way we want to and we can identify important trends. If we improve margins by only 1/10 of a percent, our payout increases by a multiple of 20. At this point, we're only using Categoric on a small scale and we've already had big-scale savings."
>
> - Paul Vantomme, CFO of Carpetland

Additional valuable insight into the operation of a business can be gleaned by tracking and analyzing the frequency with which various exception conditions occur. By tracking KPI deviations over time, for instance failed incoming quality inspections by a vendor or late deliveries by individual freight haulers, companies can not only identify negative trends but also closely monitor quality process improvement efforts. Temporary alerts can also be quickly placed against KPIs for new suppliers or vendors, monitoring performance against contractual commitments until reliability is clearly demonstrated.
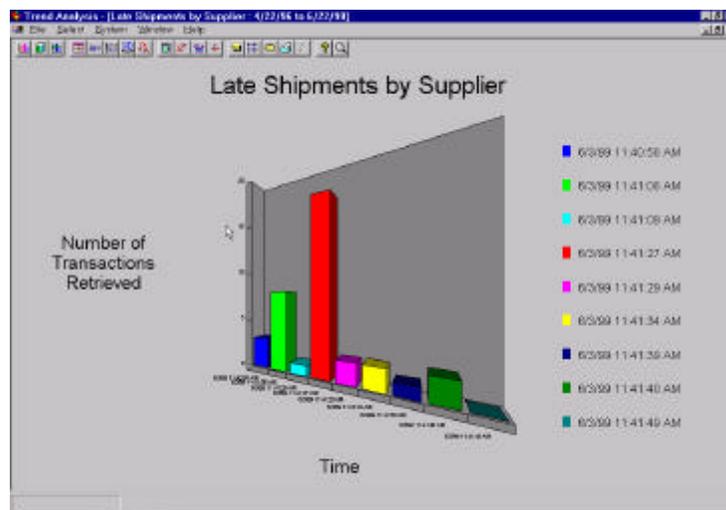
A Bridge for Disparate Applications

Prior to the availability of business event detection and notification technology, a very real challenge to supply chain management were the "information silos" that exist within and between corporations. Silos can be attributed to many causes: stand-alone departmental solutions; entrenched legacy applications; and "point solution" strategies that have not been fully integrated. Even companies which have purchased enterprise suites are not immune from "silo myopia" since these vendors have all stitched together their solution suites which include, to a greater or lesser degree, acquired solution components.

Recently introduced Enterprise Application Integration (EAI) platforms are designed to improve implementation efficiency and economy for corporations with multiple disparate applications requiring bi-directional information exchange and update. By modifying all applications to communicate through a common interface to a central hub or message broker, IT departments are able to effect a 2-way flow of data, reduce the application integration maintenance workload, and shield individual applications from changes made elsewhere in the solution landscape. But because EAI systems play an active role in the modification and exchange of data, they are by necessity heavy in behind-the-scenes functionality required to successfully manage multi-system data updates: data validation and transformation; protocol conversion; message store and forward; error handling; logging; and administration. All of this functionality comes at a price, both in terms of cost-of-ownership and time-to-benefit which may be prohibitive for an organization that really only requires cross-application data visibility in order to monitor business conditions.

For situation requiring only data visibility, business event detection and notification technology can bridge the gaps between applications or corporations in a much simpler, faster, and more cost-effective manner than EAI. Alerting produces quick returns because its non-invasive technology requires no enhancement or maintenance programming to existing systems. Event or exception conditions to be monitored are defined using SQL statements which can incorporate pre-defined data base triggers or stored procedures, leveraging an organization's existing query structures. Lastly, notification "clients" are devices employees, suppliers, and customers already use on a daily basis - pagers, cell phones, e-mail, faxes, and web browsers. Information flows directly and immediately to employees, suppliers, or customers, wherever they are - whenever something important happens that they need to respond to.

Collaboration – *FAST!*

Quantum faced a key challenge in its manufacturing process: streamlining its component supply process to lower on-hand inventory. Quantum's traditional ordering process was labor-intensive, involving numerous phone calls and manual inventory checks. To ensure that production would not be interrupted, the process required high levels of on-hand inventory. Quantum needed a solution that would automate the ordering process to increase accuracy and efficiency, reduce on-hand inventory to three days, and provide buyers with more time for non-transactional tasks.

Although Quantum could have built an event detection and notification solution internally or used somewhat similar capabilities in its Oracle ERP system, the company decided that both options would be too time-consuming and inflexible. Only the Categoric Alerts system enabled Quantum to tap into multiple data sources to identify critical business events. In addition, installation of the Categoric Alerts software took less than two days, and many functions were written in minutes. With the new component ordering system in place, the response from both Quantum's buyers and suppliers has been extremely positive.

"The estimated value of the improved ordering process using Categoric Alerts is millions of dollars of inventory reductions," stated Rob van Herk, Business Systems Analyst Manager for Quantum Corporation. The buyers have reduced transactional tasks and both sides get "a lot more information with a lot less work," according to van Herk.

A More "Intelligent" Supply Chain

As a key component of corporate strategy, supply chain management must continuously evolve to keep pace with not only competitor's moves, but industry factors such as accelerating rates of technology innovation, shortened product lifecycles driven by shifting buyer preferences, and ever-increasing customer expectations for service level improvements in every facet of the buyer-seller relationship.

Advanced SCM practices such as Vendor Managed Inventory (VMI), Efficient Customer Response (ECR), and Collaborative Forecasting, Planning, and Replenishment (CFPR) are tightly integrating trading partners and adding a new level of both intelligence and performance to the supply chain operations of companies able to invest the time and budget necessary to implement and maintain the complex solutions required to implement tightly-coupled business practices. But organizations that are already automated and integrated from a SCM perspective can still achieve improvements in latency by recognizing that commercial SCM systems, no matter how sophisticated, cannot completely address the *certainties* of operating in a supply chain environment:

- <u>Low-probability events do happen.</u> SCM systems, no matter how robust will never be programmed to recognize or respond to every event possible in business. Business execution systems are designed to model normal and expected flows of product and information with provisions made for the most likely exceptions for which there exist reasonable and structured responses. The use of alerting technology coupled with trend analysis permits quick-response diagnostic measures to be implemented quickly.

- <u>Certain situations are best addressed by people, not systems</u>. Situations will arise in which the highest value action an application can take is to immediately alert and involve a human best suited to analyze and resolve a problem or capitalize on an opportunity. The most successful supply chains will be those that can not only quickly and intelligently react to the unexpected, but institutionalize new knowledge and experience to further improve performance against subsequent occurrences.

- <u>Information silos are prevalent within corporations and inevitable in extended supply chains.</u> Trading communities are fluid environments in which goods and information move continuously. The ability to quickly initiate collaborative practices with a new supply chain member or temporarily monitor a problematic situation across departmental or corporate boundaries contributes to enabling a truly responsive supply chain.

It is in addressing these challenges to IT that sustainable competitive advantage can be created through business tactics that balance the roles of people and technology in an intelligent supply chain. Meta Group has recognized the need for a stand-alone common backbone alerting architecture that can layer in on top of existing solution environment and provide complimentary functionality. Alerting technology is the solution to the situations outlined above in that it can be implemented quickly, works across disparate systems, and facilitates change with easy modification or addition of alerts.

The Solution: Categoric Software

Despite the time and money invested in business intelligence, application integration, and business collaboration systems, companies today still frequently do not have the early visibility into business operations required to prevent business exceptions from becoming problems or crises. But now, Categoric Software is pushing the boundaries of system interaction and event notification by eliminating the delays between when events happen and when the right people find out about them. By compressing timeframes associated with traditional reporting and notification cycles, Categoric Alerts enhance productivity through improved internal awareness of business operations, more responsive management by exception practices, and reduced cycle times which lead to cost savings through greater efficiency. And by extending Alerts to customers, partners and suppliers, companies can increase competitiveness and streamline performance across every facet of the business.

In business since 1996, Categoric counts among its forty customers leading firms such as Quantum Corporation, Mott MacDonald (builder of the Channel Tunnel and the new Hong Kong Chek Lap Kok Airport), and Carpetland. In addition, leading solution providers including American Software, Artemis, IBM UK, O.I.Synform, Optum, Inc., SolutionBank Inc, and SE Technologies have also recognized the power of Categoric Alerts and are reselling the product suite to their customers and prospects.

Categoric's flagship product, Categoric Alerts, immediately connects actionable information — based on exceptions to business rules — with appropriate individuals using their preferred means of communication — mobile phone, pager, email, fax, or the Web. Categoric Alerts is non-invasive. It can be installed and implemented easily as a stand-alone system that monitors existing data. By compressing timeframes associated with traditional reporting and notification cycles, Categoric Alerts enhance productivity through improved internal awareness of business operations, more responsive management by exception practices, and reduced cycle times which lead to cost savings through greater efficiency. And by extending Alerts to customers, partners and suppliers, companies can increase competitiveness and streamline performance across every facet of the business.

Want to Know More?

In conjunction with Manufacturing Systems Magazine, Categoric is co-sponsoring a series of web browser-based interactive presentations on issues related to alert-enabling enterprise, supply chain, plant operations, and electronic commerce systems.

September 8, 1999, 10 a.m. CST (8 a.m. PST / 4 p.m. GMT)
Event-based Manufacturing and Supply Chain Processing
This seminar will feature Dan Gilmore, Senior Research Analyst, Application Delivery Strategies, Meta Group. Dan will highlight the benefits of leveraging proactive business alerts for manufacturing and supply chain planning, execution, and collaboration, including identifying operational and managerial processes that can benefit from alerts.

October 6, 1999 10 a.m. CST (8 a.m. PST / 4 p.m. GMT)
Extending Existing Systems to Make Supply Chain Collaboration a Reality
Led by Larry Lapide, Vice President & Services Director, Supply Chain Strategies, AMR Research, this seminar will demystify the notion that supply chain collaboration is complex, expensive, or requires massive IT overhaul. Case studies will show how manufacturing and supply chain companies are collaborating with their suppliers, partners, and customers via existing technology investments.

November 3, 1999 10 a.m. CST (8 a.m. PST / 4 p.m. GMT)
From Business Systems to the Shop Floor: IT Architectures for the Manufacturing Plant
Roddy Martin, Research Director, Manufacturing Strategies, AMR Research will discuss enhancing collaboration between MES and transactional control systems such as ERP, APS, and EDMS, through a shared business event detection and notification system

To register for future seminars or play back prior seminars: http://wwww.categoric.com

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