

# ELEMENTS OF A PREDICTIVE SUPPLY CHAIN

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## SUMMARY

Technology is a key to improving the art of customer-supplier relationships. Utilizing Internet based quality performance analysis tools will allow you to predict the future and the health of your supply chain. Past behavior is an important indicator of future behavior.

## KEY WORDS

Internet, Performance, Scorecard, Supplier, Statistics

## INTRODUCTION

What if you could foretell the future? What if all the signs were already there for you but you just weren't paying attention? What if you and your suppliers are actually on different planets? Technology is the key to improving the art of customer-supplier relationships.

Many leading edge companies are using technology to vastly improve supplier relationships, collaboration, and one another's bottom line.

The Federal government is moving toward requiring the use of scientifically sound digital data storage and retrieval. Utilizing technology will allow you to predict the future and the health of your supply chain. Past behavior is an important indicator of future behavior. This is true whether the subject is your teenager, your employee, or entire organizations. Make sure you know how to read the signs and respond accordingly. If you've ever wanted to move your organization from reactive to proactive; read this article.

From the basics of what makes a good relationship to the concepts and tools that make great relationships, you will see how others have been able to produce world-class results and avert disasters while saving and making \$ millions for their organizations. Avoid the fallacies of conventional supplier relationships and capitalize upon the learning of some of the world's biggest and well-known companies.

## TEXT

### PREDICT AND PREVENT STARTS WITH A GOOD RELATIONSHIP

Begin with the basic elemental building blocks of any good relationship; trust, open-ness, factual representations, mutual concern for one another's best interests, and common or shared goals, and apply them to your supplier relationships. Chances are, that your organization fails in at least one and possibly all of these critical elements.

The chances are that high level relationships share many if not all of the following characteristics:

- ❖ Common Language
- ❖ Open and consistent communication

- ❖ Trust, sharing, and open attitude
- ❖ Predictable behavior
- ❖ Truth
- ❖ Willingness to hold each other accountable for commitments and improvement

You can imagine that if you could actively engage in all of these components of a relationship, whether it be with a supplier or with an individual, you would have gone beyond a good relationship and entered the rarefied world of GREAT relationships.

### COMMON LANGUAGE

The first part of a great relationship comes from having a common language in which to communicate. From the company's standpoint, it means receiving all of its information in a common format from their supplier community, and being able to use the information to make data based decisions. For instance, a company that makes molded plastic parts must know that the common chemicals it purchases from all of its vendors have the same critical elements, or at least know those specifications before mixing the batches. By having this information in advance of the supplier's material arrival, the company can adjust their processes to make the most consistent product based on those specifications. If suppliers do not send the same information about the materials they ship, how can a company make consistent products? Even if the materials are within the specification, each lot may be on opposite sides of the specification (one supplier high and the other supplier at the mean), which may affect the final outcome of the manufactured product.

So, how do you get this information painlessly and in a common language before the materials arrive? More importantly, if the information does arrive ahead of time, is there a way to use it to be able to make decisions? When implementing a system to perform these tasks, make sure that your processes systematically help you stay ahead of your suppliers. Just as there are many shades of gray, there are many different levels of electronic communication. A common language here means having one common set of measurements, one master data repository, and various slave systems feeding data into the same collection point so that data can be aggregated, trended, analyzed, and acted upon in a proactive manner, rather than waiting for a crisis or a problem to prompt a mad dash search to try to accumulate and translate data into a meaningful message.

For instance, having the supplier's material characteristics in a fax before the materials arrive may seem good. While faxing the information is in a common "digital" format, it is essentially a piece of paper, and requires additional work to turn it into data that can be used to make decisions. Paper based data is not useful for predicting trends and behavior unless it is charted and trended. That typically only happens after a problem emerges, since it is difficult to accumulate and assimilate data into one cohesive and comprehensive picture.

Another method may have the material characteristics sent in a spreadsheet. This will put the data in a format that can be input into SPC programs, and easily compared to specifications as well as other supplier's results.

Having all suppliers' lot level material characteristics in a common knowledgebase is the

ultimate solution. The difference between a spreadsheet and a common repository is that all of the data will be in one place, and quick comparisons can be made between suppliers, plants and materials to see trends and their effects on incoming processes, as opposed to spending time and other resources to be able to make these decisions. Using the Internet to collect this data and placing into the common system is the fastest and easiest way to complete this task.

The data is speaking to you every day and in every way. Are you listening? Can you understand the predictive messages it is screaming out to you, or will you learn this language when it is too late and you are trying to explain to the world why you just didn't see the disruption or the disaster coming and being the Supply Chain's very own poster child for the Kenneth Lay Enron defense mantra, "I didn't know it was going on".

#### OPEN AND CONSISTENT COMMUNICATION

Simply put: a steady flow of communication in an open and non-defensive posture will unearth problems and mis-understandings early. The earlier a problem is caught, the less costly it is to remedy the problem before it festers and worsens and draws others into the fray. Many studies have shown the benefits to addressing a problem early. Janet Raddatz and Pat LaLonde quantified these effects in a paper presented at last year's conference. The standard state of quality, assuming everything goes well, has a basic cost of 1X. X is the amount of money used to perform basic testing, product qualification, manage regulatory paperwork, etc, for a material that meets the specification, has the right paperwork and does not require any additional manipulation. If the material is found to be non-compliant, it costs approximately 3X. Non-compliance can be anything from materials not meeting the specifications to missing paperwork to late shipping. Finally containment costs of managing a product recall start at 5X, and only go up. These costs include everything from product recalls to loss of brand equity.

It is imperative to be able to identify problems early, and then quickly put into action processes to contain and limit the risk associated with those problems.

If you measure it, or even have them measure it and report it to you, they know it is important, and will pay attention to it and improve it. However, don't settle for single discrete data points. Capture the entire trend. Remember the Six Sigma methodology of DMAIC. Define, Measure, Analyze, Improve, and Control. You can't do this in an isolated vacuum, and you can't do it on a single data point. Force yourself to read the messages you are already getting, and probably dead-filing one letter at a time. String those letters together in one comprehensive sentence, and you may be getting SOS signals that can avert a disruption or even a tragedy, and the improvements even in your supplier's processes can net each of you millions of dollars.

Having a digital solution may speed the process of problem identification and management. For instance, in the material specification case previously mentioned, having the information digitally shortens the process of finding trends, and therefore, catching problems. A customer that we work with recently demonstrated this case. The manufacturer was noticing a trend in their incoming material characteristics. While the materials that the supplier was shipping were within the manufacturer's specifications, the SPC calculations showed that the supplier's processes were drifting out of control. The manufacturer immediately stopped all shipments and had the supplier look into the issue. It turned out that their processes were drifting, and that the

supplier was in jeopardy of producing materials that would have adversely affected the manufacturer's products down the road. The containment costs were relatively minor, but the costs that were prevented were tremendous.

The lesson is that the speed in which this happened was over a 24- hour period. The manufacturer used a variety of software tools and communication mediums to stop the shipments from the suppliers before the infected materials entered the manufacturing processes.

#### TRUST, SHARING, AND AN OPEN ATTITUDE

The days of treating your supply chain as outside vendors rather than trusted partners are long gone. After all, we as Supply Chain professionals know more than anyone else that it is the quality, efficiency, innovation, and attitude that we collectively present to the marketplace in the form of our end product or service. We are collectively as a team of professionals, presenting our best work, passion, creativity and price to our potential customers and consumers. In the end, if we are the best value and taste and performance, people become more and more dedicated to consuming our particular offering. That translates into volume and that translates into market-share, and that means more efficiencies and greater market leadership and dominance which means growth and more jobs and more promotions and more shareholder value. With greater market capitalization comes more leverage and ability to acquire which means more dominance and more influence and so on and so on. The downward spiral happens in the exact same, but opposite direction if the end result of the collective supply chain is inconsistent quality or high cost or any missed expectations at the consumer level.

So you treat your supply chain teammates with the appropriate sharing, trust, and openness. Do some introspection about your supply chain. Do all of your suppliers know what are your current specifications and revision levels? Do they know your design goals? What about your cost objectives? Do they know how they have performed from your perspective over the last quarter? Last year? How they compare to others in your chain? How they can be more impactful? What are your quality standards and audit expectations? Do they know you have chosen to differentiate yourself in the market by cost? By innovation? By customer intimacy? Do they know how they should behave differently as a result?

An open knowledge-base to allow free flowing and real-time communication and data sharing leads to new epiphanies, new innovation, focused performance and the best chance of collectively behaving as one integrated well oiled machine who must embark on continuous improvement or risk getting behind the competition.

#### PREDICTABLE BEHAVIOR

Like individuals, corporations have distinct personalities or cultures that are predictable and provide clues and insight into how they will behave in pressure circumstances and almost always these collective behaviors have un-intended consequences.

Does your company manage to the quarterly pressures of Wall Street earnings expectations? Do they have a long -term strategic view of the market and insist upon quality above all else? You have to use data to pick up the clues as Sherlock Holmes might do. Your company is also sending signals to your supply chain partners about it's own beliefs and behaviors despite

whatever is written on the lobby wall stating the Mission, Vision, Values, and Quality policy.

For example, if your company is a slave to the quarterly earnings and stock prices, you probably find yourself in a chaotic re-active fire-fighting mode at the end of each quarter. Your sales team is out making big discount deals with your distributors in the last day or two of the month. Once you signal this, you have trained your channel to wait until the very last minute to place orders at big discounts. You are then in the un-enviable position of having to produce 2 months' worth of production in the last two days. Your schedules are fluid and your quality standards are relaxed. Everything is an inefficient rush and you know this is crazy, but you can't show your corporate officers what this is costing you in time, money, rework, returns, field service, and even recalls or brand erosion.

With only anecdotal evidence, your protestations fall on deaf ears. By being anecdotal, you are also signaling to your suppliers that the marginal product they may want to dump now has a home in your production line, so long as they become the hero and ship it to you during the last two days of the month or quarter.

With a comprehensive and integrated knowledgebase tying your supply chain in with facts, you can show the trends and the costs and the behavior of each participant in the chain. You can tie cause and effect together to show that those quarterly rush orders are costing an extra 10 points in margin from the distributor discounts, supplier performance erodes causing rejects, poorer incoming and first pass yields, field failures and returns tracked by the lot, and even analyze trends from different parts of the world or regions or notice patterns by line item by temperature or humidity or cycle times having adverse effects on your yields.

Remember DATA is the antidote to anecdotal.

#### THE TRUTH, HOLDING ONE ANOTHER ACCOUNTABLE, AND CONTINUOUS IMPROVEMENT

In this data driven supplier relationship, you will each be dealing with the plain old unadulterated truth; rather than debating with anecdotal evidences and perceptions. You will hold one another accountable for top grade performance. You, on the quality of your documentation and expectations and your suppliers, on their responsiveness, creativity, root cause analytical ability, yields, costs and just about everything that can be measured. Instead of being in the same old co-dependent relationships that are holding each of you back from being world class, you will have no choice but to journey together toward continuous improvement, higher degrees of success and performance, and winning the war for market position that ultimately determines your wealth, longevity, and success.

#### DOCUMENTED BENEFITS OF A DIGITAL SUPPLIER PERFORMANCE MANAGEMENT SYSTEM

Several market research papers indicate a number of benefits realized by supplier processes. Giving suppliers real-time Internet participation in quality processes can reduce defects, non-conformance/corrective action cycle time, and COPQ by up to 67%.

The following are just a few of those examples:

- ❖ An automotive manufacturer reduced its defects over all suppliers from 2,000 to 700 parts per million over one year by updating supplier ratings continuously and managing supplier corrective actions on its supplier portal.
- ❖ An electronics manufacturer reduced the average time to implement corrective actions at a supplier from 10 days to 3 days by using e-mail notification and online status tracking. Another firm reduced the average time from 30 days to 10.
- ❖ An Aerospace and Defense (A&D) manufacturer reduced its incoming receiving backlog by 83% over a one-year period by catching certification documentation problems at the time of shipment.
- ❖ An A&D manufacturer improved its data integrity for quality tracking from 50% to 92% overnight by installing a system that forced data collection at the time a quality problem was detected.

These improvements result from the following changes in business process and behavior:

- ❖ Reducing the cycle time for notification and correction eliminates additional shipments of bad parts. Suppliers realize their responsiveness is being tracked and implement corrective actions faster. The systems documented the cost of poor quality, so manufacturers could charge back suppliers for extra indirect labor related to quality problems.

## **CONCLUSION**

The digital age has provided us with many opportunities to improve our relationships with our suppliers. We now have the opportunity to take greater advantage of the communication tools out there to move away from small steps to leap frog jumps in supplier relationships. By digitizing processes, sharing information, and moving from anecdotal to data based decisions, the whole supply chain benefits from improved products, streamlined processes and overall healthier supplier/customer relationship.

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## **Speaker Biography's:**

### **Mr. Bruce Moeller**

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Global Supplier Quality Assurance, EMNS, Inc.

Bruce Moeller's 25 years of executive leadership experience in both manufacturing and information technologies companies have provided Mr. Moeller with a specialized understanding of supplier-manufacturer relationships. As Executive Vice President of EMNS, Mr. Moeller has introduced real-time predictive supplier performance management services to many Fortune 1000 companies.

Mr. Moeller has directed many manufacturing systems implementations, process improvements and is an MRP authority for high volume manufacturing plants. Mr. Moeller has held President, CEO and other executive level positions at companies such as Bell & Howell, Mutoh of America, Carlson Marketing Group, and Kurta Corporation. In addition, Mr. Moeller's experience includes direct manufacturing roles at ITT and GD Searle.

Mr. Moeller is the author of the business improvement book OH Behave!, published in January 2002 as a practical science-based guide to putting the right behaviors to work in a business environment.

Mr. Moeller's company, EMNS provides web based supplier performance management solutions specifically for process manufacturers. Global Supplier Quality Assurance (GSQA) ([www.gsqa.com](http://www.gsqa.com)) simplifies the collection storage and analysis on a global scale of what remains a paper based process for managing supplier performance, material specifications, test data, corrective actions, audits, and supplier scorecards.

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Mr. Nusbaum is degreed in electronics and has been involved in building and deploying leading edge manufacturing focused e-business solutions over the past 10 years. As the Executive Vice President of Global Supplier Quality Assurance, Mr. Nusbaum has a unique insight into the problems and challenges that manufacturers face today.

Kurt's background includes e-commerce product management for AT&T, and Supplier Quality Information Systems development and support with Lucent Technologies. Mr. Nusbaum has worked extensively with Goodyear Tire & Rubber Company and its suppliers on a collaborative web based supplier quality management system that continues to save Goodyear over \$25 Million annually.

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