The Manufacturing Industry's War Against Complexity

The Battle to Manage Customization in the Supply Chain

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A GXS White Paper for the Active Business

Gaining Competitive Advantage through Supply Chain

The Top 500 companies in the world continue to get bigger and bigger as they grow through mergers, acquisitions and international expansion. There is a book entitled the Rule of Three by Jagdish Sheth and Rajenda Sisodia, in which the authors postulated that every industry converges to three large players once it reaches a certain state of maturity. Competitive markets evolve by a natural selection process that favors the strongest, most efficient companies. The Rule of Three certainly seems to be applicable in numerous industry sectors and geographies around the world. Consider the US automotive market in which the Big 3 OEMs of Ford, Chrysler and GM have maintained top rankings for decades. In the Japanese electronics market Toshiba, Hitachi and Mitsubishi enjoy the greatest market share. In the global PC market, HP, Lenovo and Dell account for a significant percentage of revenues.

Whether each market has converged to three leaders or not can be debated, but there is no question that many markets have consolidated to a handful of very large corporations. As the operations of these large companies grow larger so does their quest for efficiency. Over the past decade retailers and manufacturers amongst the top 500 have aggressively pursued supply chain optimization in order to maximize their financial performance. Large organizations have redesigned their business models to become more responsive to changing market conditions (demand-driven); to lower operating costs for supply chain processes; and to outsource non-core functions to specialized third parties. Numerous innovations in process, partners and technology have enabled a new generation of supply chain efficiencies:

- **Process—**Large companies have embraced demand-driven supply chain processes such as vendor managed inventory, warehouse cross-docking and late-stage postponement. Companies have also optimized their financial supply chains with processes such as evaluated receipts settlement and early payment discounting.
- **Partners—**Large companies have outsourced functions to specialized service providers that provide economies-of-scale, cost advantages or process excellence that is not easily attainable in-house. Examples of these service providers include contract manufacturers, freight forwarders, original design manufacturers, third party logistics providers and fourth party logistics providers.
- **Technology—**Large companies have capitalized on the cost savings and performance efficiencies to be gained by new technologies. Examples include B2B e-commerce initiatives such as collaborative demand planning, data synchronization, electronic product codes, e-invoicing and XML messaging. Strategic investments have also been placed in enterprise applications for supply chain planning; transportation management and service parts planning.

Demand-driven supply chain processes, specialized outsourcing providers and B2B e-commerce technologies can be implemented by any large company. But, not all large companies execute on these initiatives in the same way. In fact, increasingly large companies increasingly view their competitive advantage as being derived from how they uniquely manage their supply chains. Differentiation comes from designing the best combination of partners, processes and technologies to maximize supply chain efficiency. The choices that an individual company makes regarding:

- The service providers to be included in a network of partners
- The technology platforms that are implemented
- The advanced supply chain processes that are adopted

Directly affect the competitive advantage it enjoys in the marketplace.

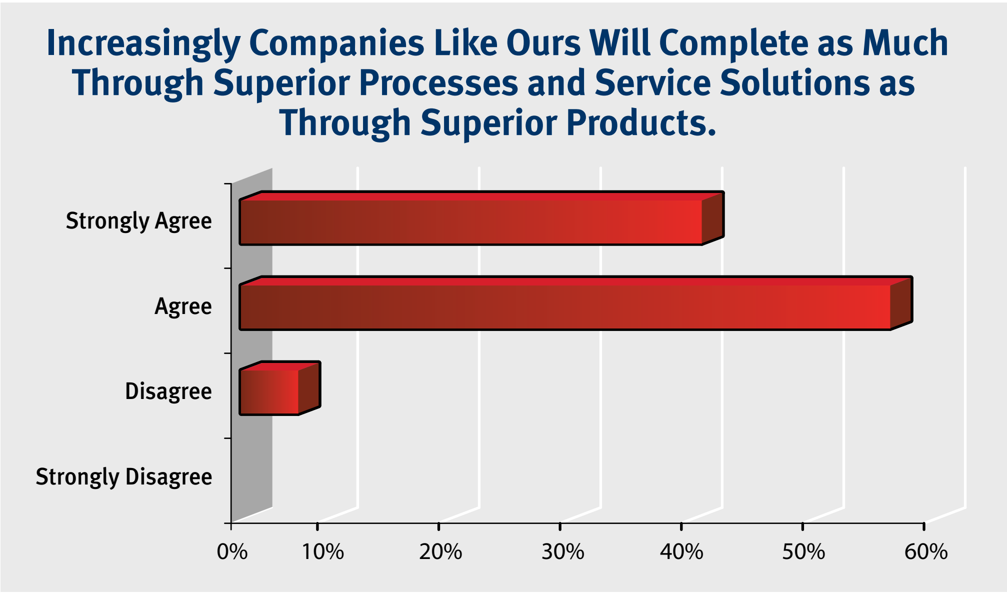

Figure 1: Competition through Process and Service
Source: SCM World 2010 – Enhancing Customer-Centric Supply Chains

Consider the following examples:

- **Wal-Mart—**differentiated its supply chain with the use of regional distribution centers, cross-docking, everyday low prices and most recently the use of technologies such as RFID.
- **Toyota—**differentiated its supply chain with Just-In-Time (JIT) manufacturing and strong supplier relationship management.
- **Dell—**differentiated its supply chain with direct-to-consumer sales and build-to-order manufacturing models as well as its online storefront technologies.
- **GE—**differentiated its supply chain model with Six Sigma to improve quality as well as through early technology investments in EDI and e-marketplaces.
- **Zara—**differentiates its supply chain with a vertically integrated approach that allows for rapid introduction of new products and low inventory turns.

Micro-Management Supply Chain Style

Once a set of best practices (vendor managed inventory, cross-docking, late-stage postponement) is identified and an optimal set of technologies (collaborative demand planning, data synchronization, radio frequency identification) is selected, large companies will then institutionalize the practice across the business. Of course, defining standardized processes for sales forecasting, materials management, inventory management, warehouse management, and invoice processing requires the active participation of suppliers. For large corporations, supplier participation is rarely an issue. Most large buying-organizations have considerable leverage over their community of vendors. In fact, buyers can usually dictate very favorable terms and conditions when negotiating with suppliers. In recent years there has been a trend towards large customers pushing suppliers to carry bigger inventory reserves, accept longer payment terms and provide faster lead times. Furthermore, large buyers have been more rigorously micro-managing the details of their own unique supply chain processes. Buyers are strictly enforcing consistent execution of guidelines for order fulfillment including product packaging, shipment labeling and carrier routing. Major retailers and manufacturers now have compliance policies that provide detailed guidelines for suppliers on:

- The allowable timeframes for acknowledging a purchase order
- The thresholds for replenishing inventory (if the supplier is responsible for managing)
- The transportation provider to use for less-than-truckload or full-truckload shipments
- The contents of the Advanced Shipment Notice EDI document
- The timeframes for advanced notification of incoming shipments (i.e. ASN delivery)
- The sequence in which to load the goods on a truck
- The types of shipment labeling technology used – text, barcode or RFID
- The location to affix the shipment labels on the container or cases of goods
- The scenarios under which shipments can be consolidated or split up
- The scenarios under which suppliers can over or under ship
- The scenarios under which a supplier can substitute one SKU or part number for another
- The acceptable time windows for delivery of a shipment
- The types of packaging materials and pallets to use
- The data fields to place on an invoice

No Margin for Error

Why such an obsessive focus on seemingly minor details about supply chain processes? The answer is that the process and approach taken for supply chain management provides competitive advantage. Techniques such as Vendor Managed Inventory, Cross-Docking, and Evaluated Receipts Settlement, which differentiate supply chain performance, cannot be implemented without a rigorous focus on process execution. Of course, there is also a significant cost advantage to be gained from consistent execution of standardized best practices.

Large companies have little choice but to design for very high levels of efficiency in distribution centers, manufacturing plants and back office support centers. A large multi-national retailer can process 50M boxes per distribution centers each year. A top tier automotive OEM can assemble 5M vehicles in their various manufacturing plants each year, each comprised of thousands of individual parts. When the standard process is not followed, costly exceptions arise. Not only do the exceptions drive cost, but they may also impact product availability, customer service and revenue potential. Consequently, today's hyper-competitive supply chains are designed for 99% automated flow through of materials and product from the supplier to the plant, the warehouse or the store. However, when exceptions occur the rate may decline to 98% or 97% of automation. The extra labor required for even a 1% decline can be significant when you consider the scale of the buyer's operations or the volume of products being processed.

Consider the impact of exceptions in the receiving process of a retail distribution center. If a freight carrier arrives a few hours after the expected delivery timeframe, then the warehouse may not be staffed to immediately process it. The warehouse staff may be occupied with other shipments. If arrives later in the day then a shift may have ended recently decreasing the size of the team on site. The costs increase significantly in a cross-docking scenario.

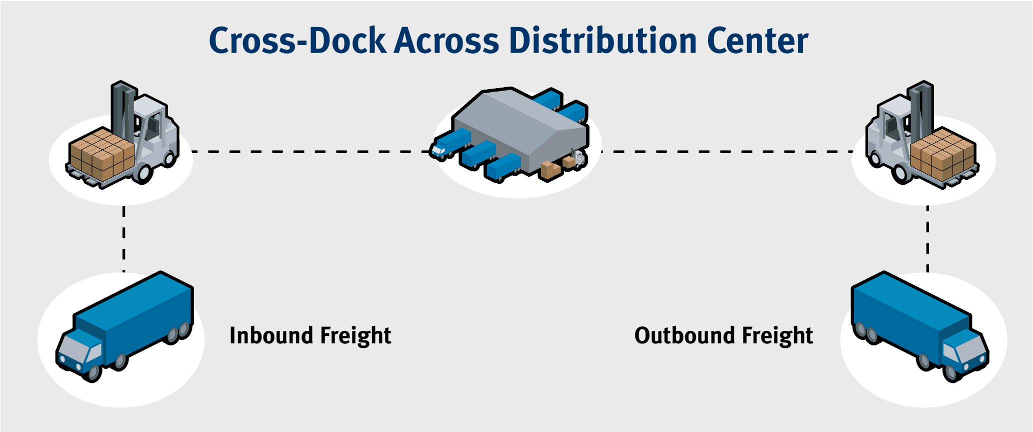

Figure 2: Cross Docking

When inbound freight arrives late, the outbound carrier that was scheduled to pick up and transport the goods to the final destination may have to sit idly for several hours. If a truckload of goods arrives without a corresponding ASN, the warehouse manager must invest time to research the order and inspect the contents. If the barcode label on a case item is not readable, then the receiving manager may need to break down the pallet to identify its contents and destination. Similar challenges occur with cases that do not have the label affixed to the correct corner of the box. In such a scenario, the automated reader on a warehouse conveyor belt will not capture its identity. Each of these exceptions can add costs and complexities. Individually, the exceptions may be $50-$250, but multiplied across the millions of shipments which occur each year, the impacts are quite significant. Consequently, today's supply chain leaders do not allow much margin for error.

The War against Complexity

The optimization of supply chain partnerships, processes and technologies is a key factor in providing competitive advantage for large retailers and manufacturers. However, for the suppliers who sell to and sell through these large organizations, the effect has been anything but supply chain optimization. In fact, these suppliers are faced with more customization as they struggle to comply with the unique support services requested from their largest accounts. No two customers approach supply chain optimization in the same way. Consequently, suppliers are forced to support a myriad of different order forecasting, fulfillment and logistics processes and a wide variety of technology standards for visibility, collaboration and synchronization. These manufacturers are in a battle against the growing complexity in their demand chains.

Consider how the supply chain optimization decisions made by large buyers affect the operations of their suppliers. For each business process in the supply chain, suppliers are forced to support multiple different models.

Process	Description of Complexity
Products	Large accounts may request customized adaptations or configurations of products to meet their specific needs. Suppliers must now catalog, price and package additional SKUs and part numbers. Manufacturers must forecast sales and manage separate inventories for these custom products to meet customer expectations about product availability. Separate customer support processes may be required for each SKU as well.
Replenishment	Some customers use a traditional order management model in which the buyer generates a purchase order based upon production or sales forecasts. Increasingly, large customers are requesting suppliers to manage inventories to reduce carrying costs. There are numerous variations of the Vendor Managed Inventory (VMI) model including consignment, kanban, schedule assignment and scan-based trading. No two customers implement VMI models exactly the same. The consumption data that is supplied, the thresholds which trigger replenishment and the performance measurement criteria utilized will vary by customer. Large manufacturers serving a diverse group of customers will need to support several different replenishment models.
Packaging	Some customers will prefer to have goods delivered to their own distribution center, while others may prefer shipments delivered directly to a retail store or manufacturing plant. Increasingly customers are requesting shipment of goods directly to the end-customer in order to minimize inventory. Such “drop-ship” models are becoming increasingly popular in B2C e-Commerce models as it avoids the carrying costs of retailers holding inventory. Regardless of where the product is shipped, most customers will specify the freight carrier to be used. Large buyers insist on their preferred carriers as they have negotiated bulk discounts for the freight services. The result is that large manufacturers serving a diverse group of customers will need to support several different logistics models.
Shipping	For finished goods, which the buyer will forward onto a store or end-customer, large buyers are seeking to minimize handling costs. Buyers prefer the products be packaged, labeled and tagged in whatever format is required for the final sale. For “drop-ship” models, customers will provide packaging materials with their name and logo that are used to ship goods to the end-customer. For warehouse delivery models, large buyers are increasingly utilizing cross-docking models. Goods arrive in the warehouse palletized for shipment to individual stores. The pallets are then simply transferred across the warehouse, each being routed to outbound carriers that will deliver the goods to their final destination. The concept of Floor-Ready Merchandise requires that suppliers ticket, label and package the individual units within a shipment such that they are immediately ready for display on the retail floor. Large manufacturers serving a diverse group of customers will need to support several different packaging models.
Invoicing	Most customers have the supplier submit an invoice for goods or services rendered. Other customers prefer to self-bill using an evaluated receipts settlement that calculates charges based upon the actual goods received. Some companies prefer consolidated billings across operating companies, while others prefer department-level billing. Some customers will offer early-payments to suppliers in exchange for a discount against the invoice. The early payments can be funded from surplus cash on the customer’s balance sheet or via a third party factoring company or bank’s supply chain finance program. Large manufacturers serving a diverse group of customers will need to support several different invoicing models.

Process	Description of Complexity
Payments	Some customers will pay only via check, which is popular in selected countries such as the US and France. Others will pay via Electronic Funds Transfer (EFT). There are several permutations of EFT. Wire transfers enable exchange of funds in a few minutes. Automated Clearinghouse (ACH) transactions take 1-2 days. ACH transactions can be debits or credits. A credit transfer can be proactively issued by the customer to the supplier's account. Alternatively a debit transfer is initiated by the supplier to deduct from the customer's account. An emerging new payment model is commercial cards (e.g. P-Cards). Large manufacturers serving a diverse group of customers will need to support several different payment models.

Of course, there are some commonalities in business processes within industry sub-sectors. However, in each industry sub-sector there are typically two, if not three, dominant models in existence. Toyota runs their plants very differently than GM. Wal-Mart runs their distribution centers very differently than Target. Dell runs their demand forecasting model very differently than Lenovo. Consequently, suppliers must support two to three different technologies for each process to satisfy customer demands. The variability in customer requirements leads to significant additional complexity for manufacturers.

Purchasing Process	Shipping & Receiving	Invoicing Process	Payment Terms
Buyer or Supplier Generated Orders	Ship to Factory Gate, Warehouse, Store, Plant	Supplier Generated Invoice or Buyer Self-Billing	Open Account or Letter of Credit
Distributed Order Management to Multiple ERPs	Drop Ship to Customer	Early Payment Discounts or Supply Chain Finance	Check, ACH, P-Card or Wire Transfer
Vendor Managed Inventory	Specified Delivery Windows & Notification Period	Consolidated Invoicing	Credit or Debit Transfer
Consignment	Item, Case or Container Level Labeling with RFID, Barcode	Department Level Billing	Consolidated Payments Options
Pay On Scan & Scan Based Trading			

Figure 3: Multiple Models Exist for Supply Chain Processes

The same types of challenges exist with the technologies selected by the customer. Each buyer selects an optimal set of standards and models for exchanging data. The result is that suppliers are forced to support multiple different B2B e-commerce models.

Technology	Complexity Challenge
Product Catalog	Numerous e-commerce standards exist for direct sharing of catalog data including the Global Data Synchronization Network (GDSN), EDI, PIES and cXML. The most popular methods for sharing product catalog data are not standardized at all, but rather manual data entry into vendor portals and e-mailing of spreadsheets. The technology standards can be used to introduce new products, discontinue retired products and change existing products. Most suppliers will need to support two or more of the technology approaches for catalog publishing along with manual processing of un-automated transactions.
Demand Forecasting	Sharing Point-Of-Sale (POS) data is a popular technique for improving demand forecast accuracy in the retail industry. Within industrial sectors such as high tech, automotive and aerospace, consumption is often communicated in terms of inventory positions. POS and inventory data can be shared via specialized SaaS applications, EDI or XML messages, vendor portals or spreadsheets. The amount of data, frequency of exchange and level of accuracy for the demand data will vary by customer.
Procurement	For direct materials, Purchase Orders (POs) are exchanged using e-commerce standards such as EDI and XML. Changes to POs are far less automated. In fact, most companies that send XML or EDI based POs, handle changes or cancellations via manual methods such as e-mail or phone conversation. With VMI models a reverse flow occurs in which the supplier sends a recommended purchase order to the buyer. For low volume, infrequent purchases some large customers may prefer to use the supplier's B2B order management portal or via punchout from the buyer's e-procurement system.
Shipment Status	Most customers prefer to receive an Advanced Shipment Notice (ASN) for inbound product flow, but the implementation can vary considerably from customer-to-customer. Customers will have different timeframes for receiving the ASN such as 24 hours in advance or by midnight on delivery date. Furthermore, customers will have rules about how ASNs can be utilized. Can a single ASN be used to notify of shipments to two different addresses? Can items from two separate purchase orders to be consolidated into a single ASN?
Shipment Labeling	Customers prefer to have incoming goods labeled with auto-identification technology to expedite receiving, tracking and re-routing of shipments. Labels can be applied only at the pallet level or at the case and item level as well. Labels may be human-readable text-only formats, barcodes or electronic product code (RFID tags) or combinations of all three. Suppliers must affix the barcode labels in specific places on the containers depending upon the customer's warehouse configuration.
Electronic Invoicing	Historically, large companies have preferred to receive e-invoices directly from suppliers in EDI or XML format. In recent years there has been a rise in the use of Electronic Invoice Presentment and Payment (EIPP) portals. With self-billing models a reverse flow of the invoice occurs as it is sent from buyer to the supplier. Customers often have different approaches to managing deductions and chargebacks. Highly automated accounts may send debit and credit advices via EDI while others will use e-mail or the phone.
Electronic Payments	All funds transfers will occur through the banking system. However, the information about which invoices were paid and which deductions were taken may travel via several different routes. Some customers will share the remittance advice directly with a supplier via EDI. Others will post remittance data to a portal. Some will share remittance details via the banking network. In other words the data flows along with the debit or credit transfer/automated clearinghouse transaction.

There is certainly some commonality in the technology models used with industry sub-sectors. However, in each industry sub-sector there are typically two, if not three, dominant models in existence. Consequently, suppliers must support two to three different technologies for each process to satisfy customer demands. The variability in customer requirements leads to significant additional complexity for manufacturers.

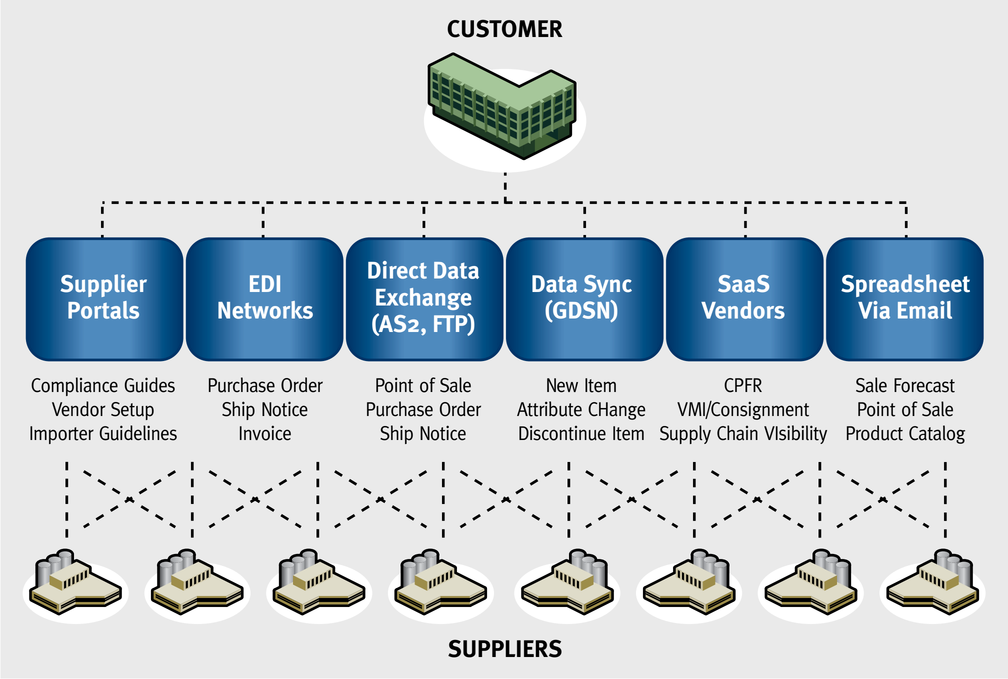

Figure 4: Multiple Models Exist for Information Sharing

Fast Moving Consumer Goods Case Study

Throughout the 1990s and early part of the new century a variety of new store formats were introduced to the retail industry. In addition to the long-standing grocery, drug and mass merchant channels, rapid expansion of new club, dollar and specialty formats emerged. The new warehouse, club and dollar chains, seeking a differentiated merchandise mix to draw consumers to their stores, encouraged suppliers to create exclusive product and packaging options unique to their stores. Examples of unique product configurations include multi-packs (same item in bulk), variety packs (mix of flavors of same item) and club sizes (packaging of complementary, but different items). Extensive customization of services occurred as well. Responding to retailer needs, Consumer Packaged Goods (CPG) companies began to offer specialized pallet configurations, Vendor Managed Inventory and dedicated in-store support.

In 2006, the Grocery Manufacturers of America (GMA) enlisted management consulting firm Booz Allen & Hamilton to perform a study entitled "Creating Value through Customization—Winning through Shelf-Centered Collaboration." Participants included retailers such as CVS Pharmacy, Meijer, Publix, Rite Aid and Target as well as CPG manufacturers such as Clorox, General Mills, Kraft, Kimberly Clark, Nestle and Sara Lee. The study results provide excellent insights into the level of customization in the CPG and retail supply chain. Over half the manufacturers surveyed supported unique sizes, customized display units or multi-packs. However, customization of services (versus products) was even higher. Over half of surveyed suppliers supported services such as customized inventory management, pre-mixed pallets, specialized handling, collaborative planning, unique routes or special pallets (Figure xx below).

Over 1/3 of manufacturers stated that customized products represented more than 10% of sales. Forty percent of manufacturers stated that customized supply chain services are now provided for accounts representing more than half of their sales. While these statistics are noteworthy, perhaps more interesting is that rate of change in customization programs.

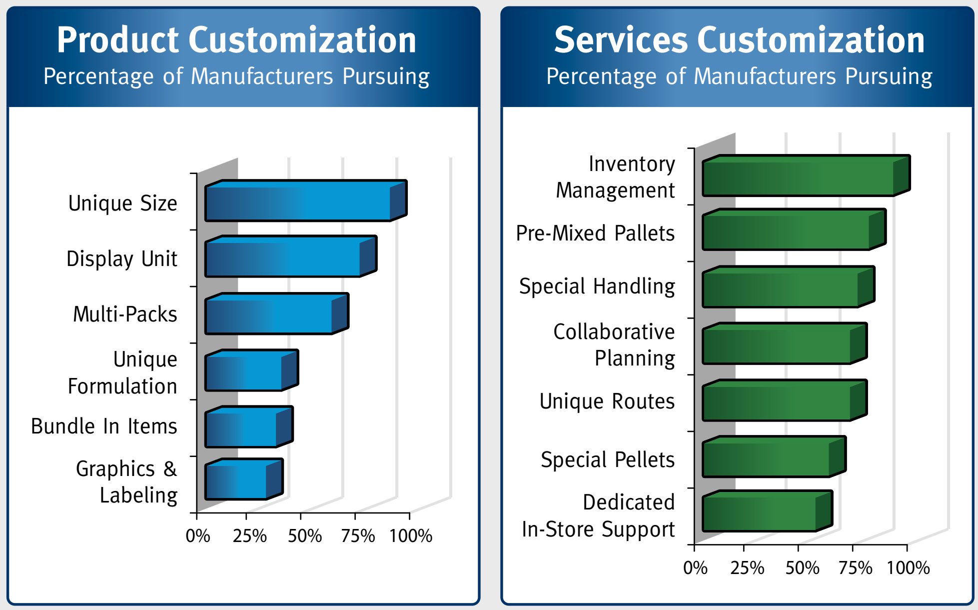

Figure 5: Product and Service Customization in CPG
Source: Grocery Manufacturers Association 2006

Approximately 70% of manufacturers stated that customization of both products and services had risen substantially over the past 3 years. Furthermore, approximately 90% of manufacturers forecasted that customization would continue to increase in the next 2-3 years.

The GMA study found that despite the significant investment focus by both retailers and manufacturers, approximately half of all customized products and services fail to create value. Why?

"One reason is that all this customization has created an enormous new source of additional complexity for both manufacturers and retailers, particularly as the varieties of customization continue to multiply. Many manufacturers now receive hundreds (some, even thousands) of requests for customization each year..."

Complexity in Manufacturing

Customer-driven customization of products and services is just one battle line in the larger war against complexity that manufacturers are engaged in.

- **Product Proliferation—**Manufacturers are supporting more SKUs and part numbers each year in an attempt to provide highly targeted offerings to specific market segments or individual customers. Consumer markets, in particular, are becoming more and more subdivided as the mass market transitions into a complex web of niche segments.
- **International Expansion—**Most large manufacturers have initiatives to expand sales outside of home markets. Some are focused gaining additional market share in the highly developed economies of North America and Western Europe. Others are focused on emerging markets such as Brazil, Russia, India and China.
- **Global Sourcing—**Sourcing of raw materials, component parts or finished goods increasingly is focused upon vendors in low cost geographies. Most manufacturers have relocated or built new production capacity in regions such as Southeast Asia, Central America or Eastern Europe.
- **Offshore Engineering—**Offshore is not limited to just production, but also research, development and engineering functions. Multi-national corporations are seeking to tap the millions of talented engineers graduating from universities in Russia, China and India.
- **Extensive Outsourcing—**Manufacturers have outsourced functions such as production to contract manufacturers, aftermarket service to 3rd party logistics providers and product engineering to original design manufacturers.

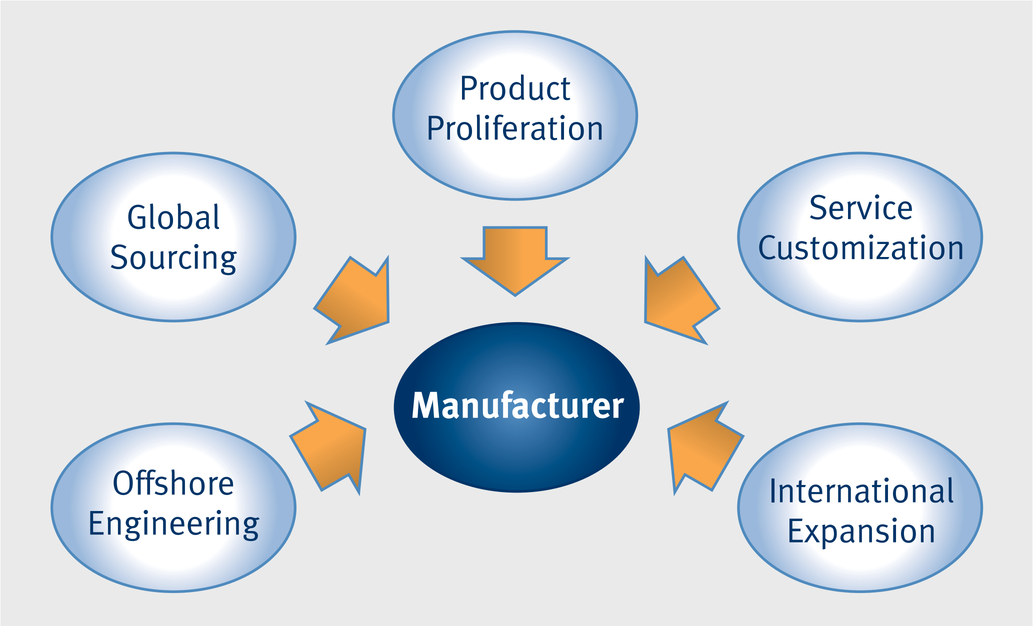

Figure 6: The War Against Complexity

There have been numerous studies by major consulting organizations on the effect complexity has to a manufacturer's operations. For instance, Deloitte Research published a report entitled Mastering Complexity in Global Manufacturing in 2003. The report states that:

"Manufacturers seeking to exploit global markets, supply chain and engineering opportunities are hitting an invisible but nonetheless debilitating wall: mounting complexity across the value chain."

Deloitte found that a small group of manufacturers, which had been able to overcome the challenges of complexity, were achieving superior financial returns as compared to their peer group.

"While most companies struggle to put the pieces together, a small group of manufacturers have excelled amid the complexity. These 'complexity masters,' as we call them, are being rewarded handsomely."

More recently in July 2010, Boston Consulting Group (BCG) published a report entitled *Mastering Complexity—Capture the Hidden Opportunity*. BCG stated that

"The trend toward product customization allows customers to have it their way, but wreaks havoc on production schedules and inventory management."

On the specific topic of customization, BCG stated that

"Product variety can be a competitive differentiator, but it requires more designers and engineers, more components and raw materials, more changeovers in production lines, higher inventory levels, more plant and equipment, and more people to market, support and manage the product and customer portfolios. Many of these costs are indirect and not readily apparent."

Boeing's 787 Dreamliner project offers an excellent example of the complexity today's leading manufacturers confront. Design and production have been outsourced to a network of suppliers in Italy, Japan, US and other countries around the world. The overwhelming complexity associated with the model has been a key factor in product launch delays.

Apparel, Footwear and General Merchandise Case Study

To ensure consistent execution of preferred supply chain processes, the general merchandise and department store sector of the US retail industry has created a sophisticated system of performance incentives for suppliers. The performance management system manifests itself in the form of retailer compliance guides, which outline detailed rules for logistics and order fulfillment activities. These guides are designed to ensure that processes such as Floor Ready Merchandise and Cross Docking can be executed consistently in high volume distribution centers. Unfortunately, one of the key challenges is that there is very little consistency between the retailers on the specific metrics being tracked. The lack of consistency creates significant complexity for manufacturers each of which may have 75 to 100 different retail customers each with different types of rules. The ability to comply with retailer-specific rules is quite challenging for even the largest suppliers.

The Vendor Compliance Federation (VCF) performed a study in 2006 of the compliance guides being utilized by 30+ retailers. Consistency in measurement criteria typically simplifies processes for suppliers. However, even in the case of consistent performance measurements, differing interpretations of the results leads to further complexity. For example, the most frequent deduction category was "late shipment" utilized by 85% of the retailers. However, there is widespread disagreement on how to measure whether a shipment is late. The Warehouse Education Research Council (WERC) conducted a study in the spring of 2005 to understand how companies measured "On Time Delivery" to warehouses and distribution centers. 42.7% believed that On Time Delivery means product delivered on the "requested" day. But the remainder of survey participants cited more specific windows:

- 16.8% stated "on time" is on or before the appointed time
- 15.9% stated "on time" is on the "agreed upon" day
- 11.2% stated "on time" is +30 minutes from the appointed time
- 9.1% stated "on time" is +1 hour from the appointed time
- 4.3% stated "on time" is +15 minutes from the appointed time

Another dimension which compounds the challenges associated with deductions is the fact that retailers make changes to the compliance guides. Some chains update the rules every 3-5 years. However, others publish changes 10-12 times per year. Some retailers will send proactive e-mail notifications to the supplier community while others will more passively post changes to a PDF on their vendor portal. In either scenario, suppliers must invest time to regularly monitor retailer communications and web sites for changes.

Customization—A Well-Kept Secret

If customization is such a major issue, why isn't there more discussion about it? The impact of customization is a well-kept secret in most industries. For example, you will not read much about the customization challenges companies face with their demand chains in the media. That is because no supplier wants to talk publicly about the issues. Who wants to go on record complaining about their largest accounts?

Furthermore, the large corporations causing the customization seem to have a blissful ignorance about the ramifications of their approach. You won't meet a supply chain executive which thinks of their operations as "customized." The buyer, of course, has the perspective that they are improving efficiency in the supply chain by standardizing with best practices. But unfortunately, no two companies standardize in the same way. As a result, what one company considers standard is viewed as custom by another. The situation is unlikely to change. If all companies used the exact same technology, partners and processes then how would one gain competitive advantage over another? Perhaps most ironic, is that most large manufacturers which struggle with customization on the sell-side of their business are driving the same types of customization challenges into their supplier base on the buy-side of their business.

Another question to consider is that if customization is such an issue in the demand chain for manufacturers then why is there not more backlash against customers? The answer is that suppliers, no matter how large, rarely have the bargaining power in a relationship. There was a time 20-30 years ago when suppliers in the industries such as Fast Moving Consumer Goods, Apparel & Footwear, Industrial Manufacturing, Medical & Surgical Products had considerable market power. In fact, the manufacturers would typically drive supply chain initiatives with a goal to achieve further efficiencies. However, the balance of power has shifted in most cases.

Consider the following three examples:

- **Retail—**Large chains such as Wal-Mart, Carrefour, Tesco, Metro, Home Depot and Macys have the power in today's retail industry due to their extraordinary size and sales volume. Even large suppliers such as Procter & Gamble, Nestle, Unilever, Kraft, Nike and VF will go to great lengths to meet the customized needs of customers.
- **Automotive—**Large OEMs such as GM, Ford, Renault, Volkswagen, Toyota and Hyundai have the power in today's automotive industry as brands have merged and consolidated into massive holding companies. Large auto suppliers such as Bosch, Denso, Continental, Magna, Delphi and Faurecia each develop highly customized support processes for their large customers. In fact, many have co-located their plants in proximity to the OEM sites.
- **High Tech—**Large OEMs such as Cisco, HP, Dell, IBM, Apple, Sony and LG have the power in today's high tech industry. As information technology has exploded in the past 20 years, these firms have grown both organically and inorganically to become some of the world's largest brands. Component suppliers and contract manufacturers such as Intel, Seagate, Flextronics, Hon Hai and Samsung perform extensive customization to support large accounts.

The buyer-dominance that leads to supply chain customization is not omnipresent. The phenomenon is most acute in market segments where significant industry consolidation has occurred. The diagram below illustrates several examples of buyer-dominated sectors.

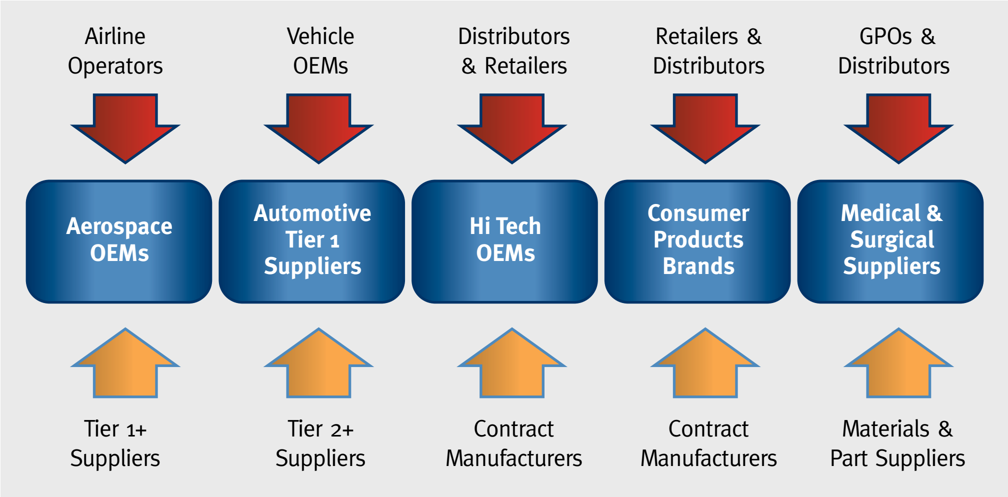

Figure 7: Manufacturing Segments with a Consolidated Customer Base

However, there are numerous sectors in which the buy-side of the industry remains highly fragmented. For example, most auto dealerships around the world are small and medium businesses, which are largely driven by the strategies of the OEMs (the suppliers). Many of the hospitals in the US are small and medium businesses, whose supply chains are controlled by a powerful group of health care distributors and medical device manufacturers. Much of the computer and networking equipment sold around the world occurs through Value-Added-Resellers (VARs) and specialized distributors.

The Sell-Side View—Competing for Differentiation

Historically, companies have viewed differentiation and competitive advantage as coming from product features or pricing advantages. However, sustainable differentiation based upon feature, price or performance has become significantly more challenging in the past decade.

Competing on price has become equally challenging as low-cost manufacturing centers emerged in Central America, Eastern Europe and the Pacific Rim. There is always a cheaper source of materials, parts or finished products. In most market segments, low-cost private label or generic versions of products are widely available at extremely competitive prices. The Internet provided new levels of transparency to pricing for B2B purchases. Technologies such as reverse auctions and electronic marketplaces enabled purchasing managers to seek out low-cost materials and finished goods from a global base of suppliers. Today, the advent of web 2.0 and mobile technologies is arming consumers with new levels of pricing transparency and purchasing power. Consumers are using social platforms such as Groupon for collective bargaining agreements with local merchants.

Apple is widely considered one of the most innovative companies in the world. Yet even Apple cannot escape the threat of imminent commoditization and replication of their intellectual property. Counterfeit versions of Apple's recent iPhone 4 were released on the streets of Shenzhen several weeks before the official, authentic product was available in the US. Shanzhai cloners developed a fake version of the iPad called the "iPed" which was released shortly after the commercial launch. Counterfeiters, however, are not the biggest threat. In today's "tear-down" supply chain, hit products are quickly dissected by experts who publish the entire configuration online. The level of transparency that exists in today's market for product design combined with the agility of contract manufacturers to replicate intellectual property, compromise even the most innovative company's ability to achieve long-term differentiation.

Neither mobile phones nor Apple are unique in their challenges with building sustainable differentiation in products. Manufacturers in almost every market segment struggle to avoid commoditization. Hundreds of new innovative new pharmaceuticals, food products, apparel designs, computing platforms, aerospace parts and automobile engine technologies reach the market each year. Most of these new products are matched in features or performance by their competitors just a few months later.

If your products are less differentiated and your pricing can be undercut, how then do you compete to gain more market share at your largest accounts? Many companies are turning towards differentiation models based upon customer service. Excellence in service is difficult to achieve and even harder to replicate. Suppliers have a significant opportunity to provide customized services to their large customers that meet the specific needs of their supply chains.

Differentiation upon process excellence has become as important as differentiation based upon product features. A 2010, SCM World Study on Customer-Centric Supply Chains found that 95% respondents agreed that "companies will compete as much through superior process and service solutions as through superior products."

You may be skeptical that a business focused on manufacturing products would choose to differentiate itself based upon process or service. If so then you have never spoken to a six sigma professional. Companies such as Motorola, Caterpillar and GE have been able to demonstrate remarkable improvements in quality, reliability and customer service through Six Sigma implementations. Both process and service are increasingly critical to manufacturers. Why do product-oriented manufacturers care so much about service? Deloitte recently published a study entitled The Service Revolution in Manufacturing Industries, which stated that "Manufacturers are looking for growth and profits in all corners of the globe, but they often neglect the very large opportunities much closer to home – in their own service business." Service is important to manufacturers because it helps to:

- Meet customer expectations for mission critical processes
- Improve resistance to low-cost competitive threats and economic downturns
- Generate more profits over the lifecycle of the product

To some manufacturers, the idea of service-led differentiation is not new. Henry Ford, the father of mass production, stated "A business absolutely devoted to service will have only one worry about profits. They will be embarrassingly large."

How to Master Complexity

There are two ways to view complexity—as a challenge or as an opportunity. Manufacturers can take the view that the glass is half empty. In other words, complexity is an overwhelming challenge that burdens manufacturers with excessive costs. Alternatively, manufacturers can take the view that the glass is half full. When one considers that all manufacturers are challenged with the same needs to respond to complexity in their demand chains, an opportunity for differentiation emerges.

An increasing number of suppliers are turning challenge into opportunity. These leaders are enlisting the help of specialized outsourcing providers and new technology platforms to wage war against complexity. Those manufacturing companies which can master the complexity in their demand chains will be the long-term winners in the marketplace.

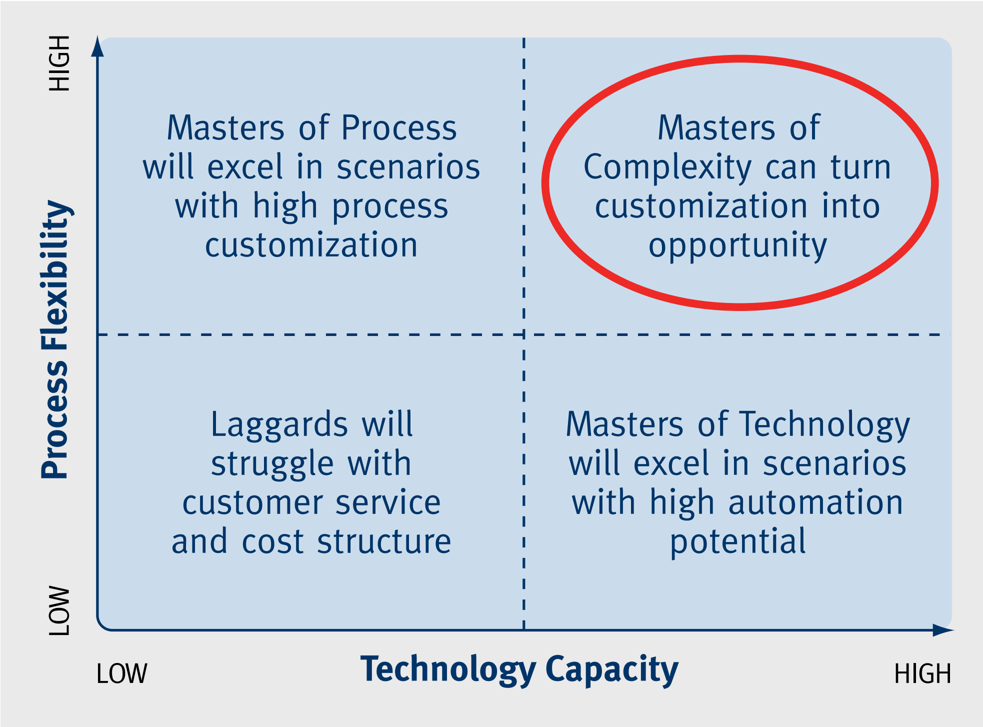

Figure 8: Masters of Complexity

Note: The idea of a "Complexity Master" is based upon concepts developed by Deloitte Research in their report entitled Mastering Complexity in Global Manufacturing published in 2003.

Suppliers which can manage the complexity of their demand chains effectively will rank the highest on performance scorecards. These masters of complexity will enjoy higher profit margins from minimized deductions and chargebacks. They will be "easier-to-do-business-with" leading to account growth, increased collaboration and more strategic relationships with their largest accounts.

Those suppliers, which can utilize technologies such as B2B e-commerce to overcome the challenges of customization, will be able to delight customers by servicing their unique needs in a consistent manner. These leaders will not only enhance customer satisfaction, but also differentiate themselves in the marketplace and grow revenues at their largest accounts. Will your business be a master of complexity?

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