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The Lean Supply Chain Report

Lean Concepts Transcend Manufacturing through the Supply Chain

September 2006

Executive Summary

Despite publicized successes of Lean on the factory floor, manufacturers are still finding themselves adopting it slowly across the Enterprise, and beyond the shop floor. Reasons vary, from continued senior management commitment to the ability to quantify results beyond the plant floor. Although C-level executives are enthusiastic about the benefits that can be derived by "Leaning out" manufacturing operations from plant to plant, this study uncovered a large performance gap between those companies that are simply using Lean techniques on the shop floor versus those that have built a culture based on Lean thinking throughout the Enterprise and in particular, the supply chain. This study examines the degree and way that Lean has or will transcend manufacturing, and be adopted across the supply chain. It provides an understanding of the processes and measurements employed, current or planned benefits and the associated technology enabling solutions required to support Lean today and in the future.

> "We continued to drive our Lean initiatives throughout the supply chain, and **our gross margin has gone from 3% to 50% over the past 4 years."**
>
> -Don Alvine, Vice President Supply Chain Management, Agere Systems

Key Business Value Findings

To achieve a high degree of flexibility and customer responsiveness, manufacturers must blend a combination of Lean philosophy and new technology to quickly design new streamlined operations, ***both within and beyond the shop floor.*** Extensions of Lean throughout the supply chain are the next logical step in order to ensure successful value stream execution and provide the business cycle analytics in support of the continuous improvement process that is so central to Lean.

Best in class are characterized by an integrated approach and solution with technology enablers: automated line design, electronic Kanban, extended to a network of suppliers and other plants, automated demand pull scheduling and tracking of orders into manufacturing and through the supply chain, visibility and control capabilities, and cross-functional metrics.

Achieving superior business performance with a Lean strategy is linked to three elements: pervasiveness from the shop floor to the supply chain, consistent senior management commitment across the supply chain of suppliers, customers, and distribution partners, and finally, extension of Lean concepts and techniques across the value chain. When manufacturers applied a Lean strategy across the organization, had top management actively engaged, and integrated the sell and supply sides of the value chain, they were much more likely to be an industry Best in Class performer.

Of the 308 manufacturers that participated in this study, 90% reported that they are committed to Lean. However, further analysis found that less than 10% of these companies can be considered Best in Class. Companies looking toward both manufacturing and sup-

ply chain operational excellence through the deployment of an enterprise wide Lean strategy share three common experiences:

- **A *unique set of barriers and challenges exist*** as enterprises extend their Lean initiatives across the supply chain. These barriers and challenges can be overcome with the correct amount of focus and a revised approach toward Lean as it is rolled out throughout the supply chain.
- While still a strong force, ***Lean philosophy takes a back seat to Lean business processes and Lean enabling technologies***. Enterprises are more likely to take a pragmatic view and turn to enabling technology in support of Lean, streamlining benefits across the supply chain.
- ***Opportunities abound*** for Enterprises as they embrace Lean principles and tactics throughout manufacturing and the supply chain as a cohesive Enterprise strategy.

Implications & Analysis

For those companies willing to make the commitment, Lean initiatives extended through the supply chain can pay dividends in the long term. Successful Lean implementations have met and exceeded the performance expectations of over 70% of Best in Class companies in areas such as customer service and supply chain flexibility. In many cases, technology solutions are enabling Best in Class companies to outperform their competitors by continuously measuring, monitoring, and responding to key production and supply chain metrics in real-time. Additionally, ERP, Supply Planning, ,and Lean logistics solutions provide the foundation from which companies are institutionalizing value streams, improving productivity, preparing for new product launches, and driving culture change throughout the company and its supplier base.

Recommendations for Action

When Leaning-out your supply chain, focus closely on the following recommendations:

- Include major suppliers, customers, and partners as part of the audience during the transition to 'Lean' concepts, both in production operations and as they are deployed across the supply chain
- Evaluate each supply chain process as to applicability of Lean concepts as well as processes within the enterprise and cross-enterprise
- Performance Measurements that span the supply chain network must be incorporated. Measure quality, cost and delivery performance.
- Build mutually beneficial relationships with partners to share information and synchronize planning activities driven by customer demand and characterized by 'Pull' demand concepts.

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Chapter One:
Issue at Hand

Key Takeaways

- While over 90% of respondents consider themselves Lean, less than 20% have extended their Lean deployments beyond the manufacturing shop floor.
- Unique challenges exist as Lean extends beyond the shop floor; Lean philosophy takes a back seat to Lean enabling technology as manufacturers extend programs through the supply chain.
- Significant culture change beyond manufacturing remains the top challenge; data and process standards are also barriers to a Lean supply chain.

To date, most of the 'buzz' around the adoption of Demand-Pull and 'Lean' manufacturing concepts within an enterprise has been linked to the shop floor. Production operations have been the target of most Lean Manufacturing deployments. But 'Lean' manufacturing tools and techniques can be extended beyond the Shop Floor to processes that are unique to and transcend efficient production operations and supply chain systems. The extension of Lean manufacturing concepts across the supply chain network of suppliers, customers, and partners can result in real value creation for the savvy enterprise. A Lean strategy is a philosophy that espouses the elimination of all forms of waste, continuous improvement, and simplification / standardization of business processes. Early on in its adoption phase, many manufacturers limited the effectiveness of their Lean initiatives because they translated the definition of Lean to mean that it is specifically targeted for manufacturing operations on the shop floor and requires immediate and dramatic operational change. Also, it is generally believed that Lean specifically requires the use of specialized techniques and tools, such as Kanban, supermarkets, etc. that are not reliant on IT solutions. These assumptions are not necessarily the case as we push Lean into supply chain operations.

Competitive Framework Key

The Aberdeen Competitive Framework defines enterprises as falling into one of the three following levels of practices and performance:

Laggards (30%) —practices that are significantly behind the average of the industry

Industry norm (50%) — practices that represent the average or norm

Best in class (20%) — practices that are the best currently being employed and significantly superior to the industry norm

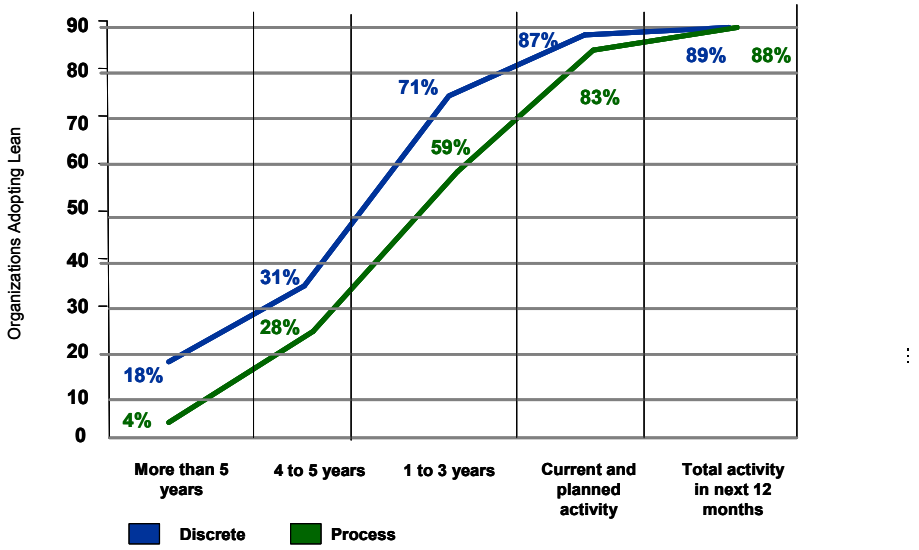
To achieve a high degree of flexibility and customer responsiveness, manufacturers must blend a combination of Lean philosophy and new technology to quickly design new streamlined operations, ***both within and beyond the shop floor.*** Extensions of Lean throughout the supply chain are the next logical step in order to ensure successful value stream execution and provide the business cycle analytics in support of the continuous improvement process that is so central to Lean.

A quick examination of any manufacturer would find that waste — all activities that do not add value to the customer — is rampant across its supply chain. Continuous improvement implies instilling the culture that promotes and rewards improvement at all

levels of the company. Manufacturers have begun to separate the Lean philosophy from the techniques and tools (such as Kanban and supermarkets) used to support the philosophy in manufacturing, and examine how other techniques and tools utilizing the same philosophy can be applied throughout the supply chain.

As the success of Lean has become more widely known, it is being adopted by many industries and is spreading into many other areas of the value chain. For those manufacturers successfully adopting Lean, the motives are clear — provide superior value to the customer while at the same time improving operational efficiencies and profitability.

Figure 1: For Manufacturing, Lean has Become Mainstream



Source: Aberdeen Group, March 2006

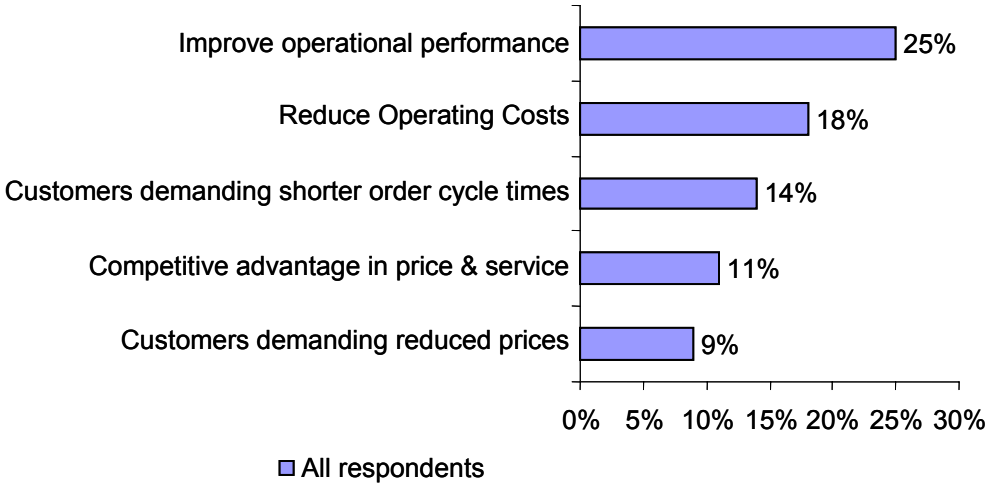
According to Aberdeen's *Lean Benchmark: Closing the Reality Gap Benchmark Report,* Lean adoption is broadening in scope year to year (Figure 1). While Lean efforts within the plant have had a profound effect on manufacturing process efficiencies, continued Lean efforts that transcend through the supply chain will have the most significant impact on improving external performance. The opposite is not true. Concentrating on internal metrics such as unit cost and asset utilization will have little effect on external performance, as enterprises extend Lean concepts and techniques beyond the plant floor in order to improve enterprise-wide process efficiencies.

Pressures Driving Lean beyond the Factory

While Manufacturers are using Lean strategies and processes to transform from "push- to pull-based" manufacturing, the evidence of residual push-based methodology is also evident as extensions of Lean are driven through the supply chain. The incentive to push Lean strategies outward from the domain of manufacturing come from pressures to improve operational performance, reduce costs and improve cycle times (see Figure 2). The results show that Best in Class performers are twice as likely to make Lean processes pervasive — well beyond manufacturing — and use it for all forms of decision making.

Lean deployed beyond manufacturing and into customer, supply chain, or product commercialization processes is still low, thus indicating a broad opportunity for Leaning out the supply chain. This level of change is not without risk, and risk or reward is central in the minds of manufacturers adopting Lean strategies — with people and process being the top concerns, as well as technology. Not surprisingly, having a method to quantify and subsequently measure the business impact of Lean supply chain initiatives is a clear necessity requested by respondents.

Figure 2: Pressure Driving Lean across the Supply Chain



Source: **Aberdeen***Group*, August 2006

Chapter Two:
Key Business Value Findings

Key Takeaways

- Best in Class organizations are more dedicated to customer-focused activities.
- The "Lean Journey" doesn't end. Best in Class to laggard companies are all prioritizing supply chain flexibility and manufacturing improvements.
- As Lean extends throughout the supply chain, automating processes to streamline the flow of production becomes critical.

Companies adopt Lean for a variety of reasons. For instance in the automotive, aerospace, and a growing number of other industry sectors, "going Lean" is a requirement for doing business; it is mandated by OEMs and major aircraft companies. Also industries that ultimately serve the consumer have seen new mandates over the past couple of years; in many cases requiring delivery times to drop radically from a few weeks to a few days and in others mandated price reductions are taking their toll. For most companies this equates to reducing costs and improving operational performance.

As companies grow more mature with their Lean initiatives and have proven the value at the shop floor, the next logical progression is the extension of Lean throughout the enterprise. As 41% of companies with Lean reach the 5+ year maturity mark, (not shown) their next priority is to extend practices throughout the supply chain, streamlining supplier sourcing, as well as logistics and sales operations, and enabling manufacturing and logistics to work better together to dramatically improve customer service. Considering the number of companies that source directly to their customers from their suppliers and that have a high degree of product value content coming from suppliers, streamlining and synchronizing supplier performance via Lean can also be critical to the overall Lean value chain effort. Equally important is engaging logistics and supply chain service providers in the Lean initiatives.

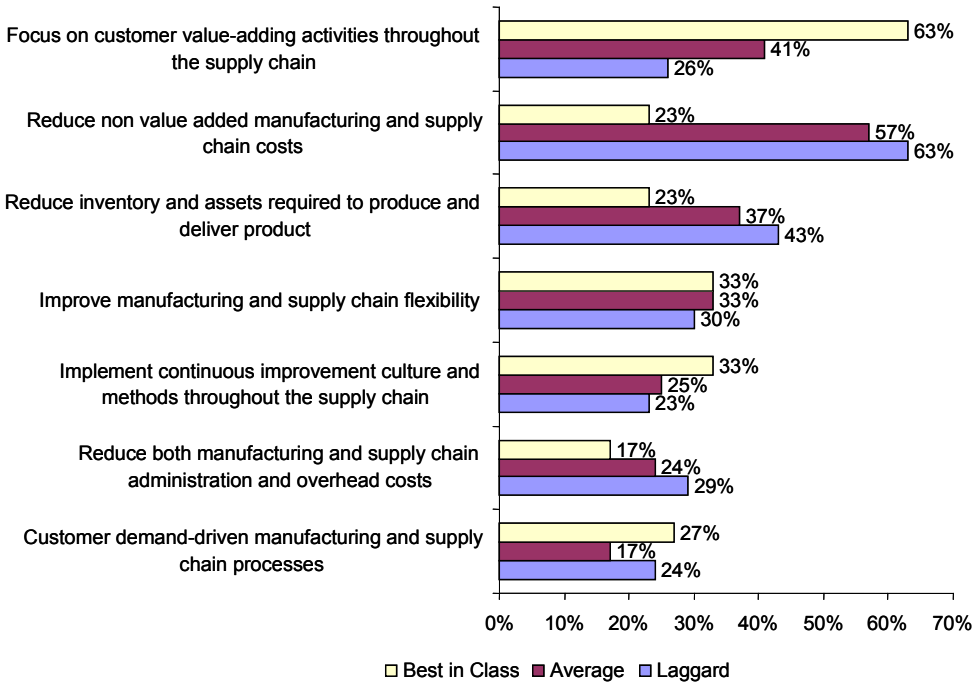
Strategic Actions

As Best in Class manufacturers actively extend Lean throughout the supply chain, actions have a greater focus on the customer. Compare this to average and laggard companies that are struggling to reduce costs and inventory (Figure 3). It's clear that without the appropriate level of coordinated efforts throughout the supply chain, manufacturers will continue the uphill battle to improve operational performance, without focusing on the core tenant of Lean and the true path for operational excellence: being agile and responsive to the customer.

As we talk about Lean as a continuous journey, it's interesting to note that *improving manufacturing and supply chain flexibility* is a focus for all companies, regardless of whether they are Best in Class or laggard. But while the Best in Class make continuous improvements to their Lean initiatives to maintain their momentum, laggard and average

companies are still struggling to make progress at the plant level (see Chapter 3 for a detailed definition of how Aberdeen defines Best in Class, Average and Laggard.)

Figure 3: Top Actions for Lean Supply Chain-Best in Class, Average, Laggard

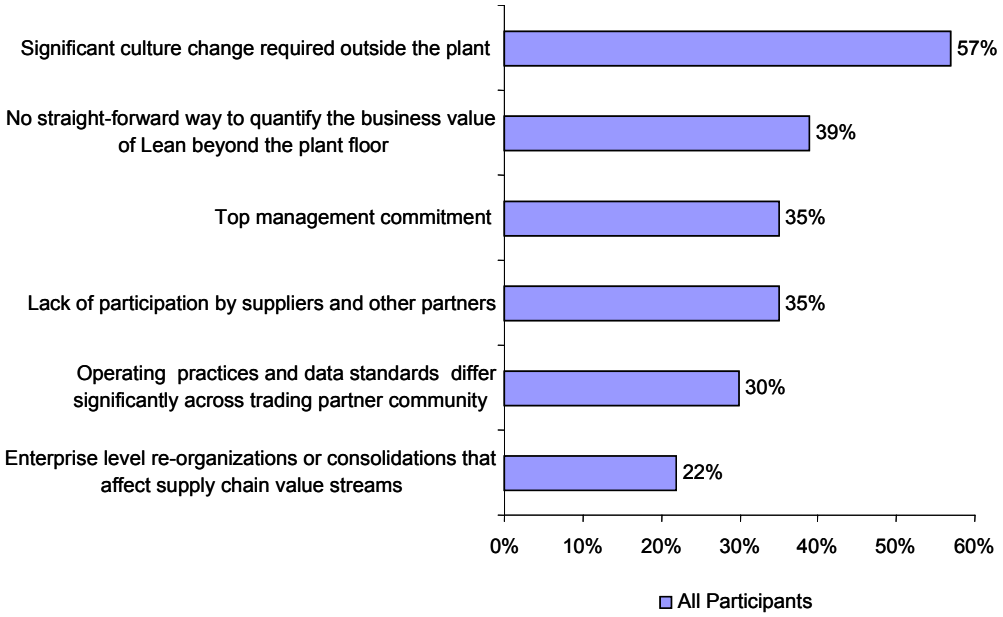


Source: AberdeenGroup, August 2006

Challenges and Opportunities

Unique challenges exist as manufacturers extend their Lean initiatives beyond the plant or factory floor. The philosophy and culture of Lean had its roots on the shop floor, and so it comes as no surprise that separate and unique challenges arise when enterprises venture outward with their Lean initiatives.

Figure 4: Top Barrier to Adoption/Expansion of Lean Strategies



Source: **Aberdeen** Group, August, 2006

The challenge of '*Cultural Change*' at 57% companies was the most frequently cited challenge, reflecting the inherent nature of the cultural differences that exist in general between manufacturing and shop floor operations and other departments, as well as the Lean component of a cultural initiative (Figure 3). Lean as a philosophy, is certain to lose some of its emphasis as it moves further away from its origins.

> "The biggest hurdle in the first 12 months of our Lean initiative was helping people understand the way they were now going to work. We had to communicate why the process was changing, and what it meant to each employee."
>
> -Bill Owad Senior Vice President Operational Excellence, Cardinal Healthcare

'*Ability to quantify the business value'* at 39% respectively illustrates the need for any change program such as Leaning out the supply chain to provide metrics that correlate the investment with the resulting ROI. While metrics on the shop floor like Operational Performance, Asset Utilization, and Overall Operational Efficiency (OEE) were nature outcomes and complementary to Lean, the measurements throughout the supply chain are not as directly connected to measuring Lean impact and performance.

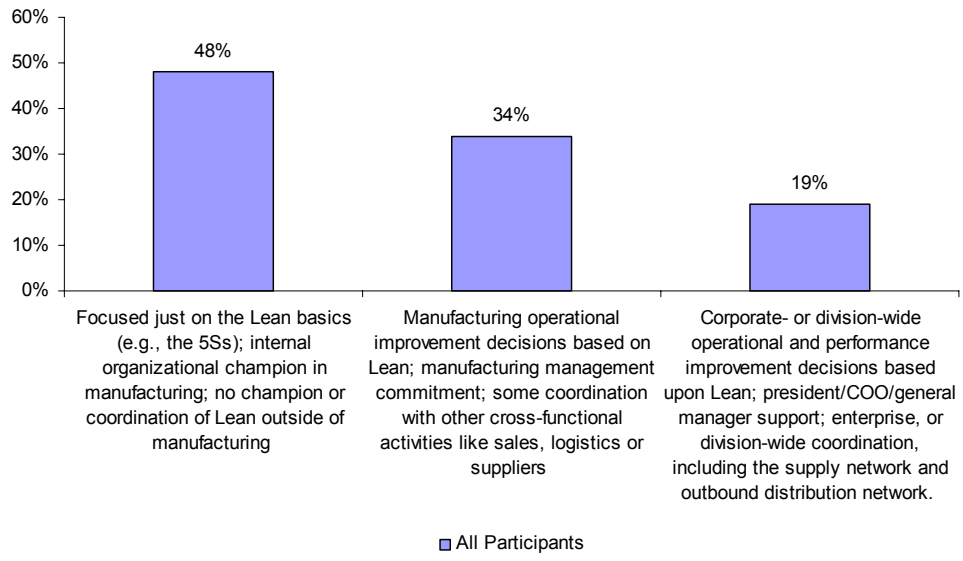
'*Lack of participation by suppliers and other partners'* at 35% respectively is an indication of the control and collaboration challenges in developing a Lean 'pipeline' with inbound and outbound participants all adhering to a common set of goals, processes, and using common concepts and techniques to share data and information.

Much has been written about the need for *Top Management Commitment*, yet this remains a significant barrier to adoption in over a third (35%0 of companies.

'Lack of operating practices and data standards' at 30% respectively is directly attributed to the diverse nature of the varied partners from both the inbound supply side and the distribution outbound side that have their own sets of procedures, standards, and measurements that are rarely in synch with manufacturing operations.

But the benefits are clear. The early adopters of Lean concepts through the supply chain have seen significant results, cutting contact-to-order time for complex products from several months to several days, as well as manufacturing and delivery times from several weeks to several days. In addition, Lean supply chains are operating with virtually all inventories either in process or in motion while achieving delivery reliability that approaches 100%.

Figure 5: Lean Organizational Challenges, Beyond the Four Walls



Source: **Aberdeen** Group, August, 2006

Another challenge in extending Lean concepts through the supply chain has to do with the organizational changes required, illustrated in Figure 5. Corporate or division-wide operational and performance improvement decisions based on Lean must include division-wide coordination including supply network and outbound distribution network entities. This is a coordination and communication challenge and burden for many manufacturers to achieve, with 19% of manufacturers incapable of this type of execution. The ability of manufacturers to overcome this challenge is contingent upon their ability to clearly define value stream maps of customer value-added processes including supply

chain activities and to connect the dependencies both to form a cultural and an operational perspective.

Technology-Enabling Lean Processes

As Lean moves from the plant floor to the supply chain, it becomes more difficult to orchestrate activities without automation. Although the Lean early adopters were not proponents of technology, circumstances have changed. The majority of manufacturers rely on a combination of corporate ERP and semi-automated Lean processes to support their business operating models. As these companies achieve solid ROI with Lean pilots and programs, operational knowledge should be captured electronically so that Lean processes can be (at least partially) replicated and scaled (larger or smaller) into other factories and supply chain partners. Many advances in technology including Web-based solutions, improved analytical tools, and access to real-time production data, bear consideration and closer examination by Lean manufacturers.

> There has to be a greater reliance on enabling technology… We've had parts and supplies coming from Korea and Taiwan and two different vendors in Japan for a product that needed to be assembled in Bangkok, only to be delivered to a customer in China. The only way we were able to do this and deliver to the customer when they request it has been through leveraging enabling technology.
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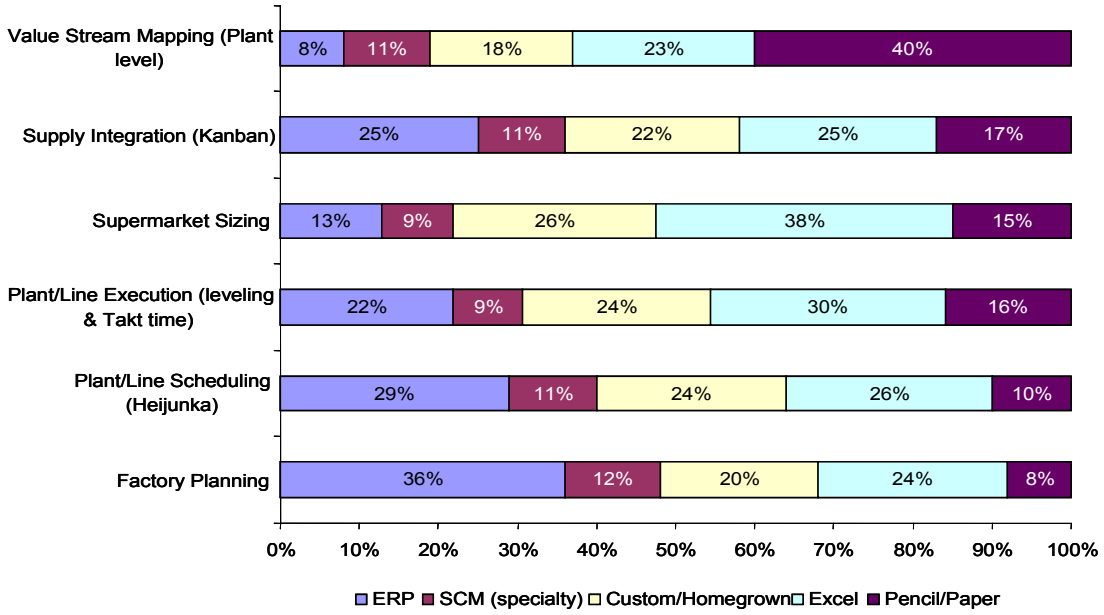
> --Don Alvine, Vice President Supply Chain Management, Agere Systems

As shown in Figure 6, many key Lean processes remain un-automated; *Value Stream Mapping* is the least automated (63% still manual). VSM workshops are designed to encourage healthy debates that culminate in the publication of (often on white boards in the factory) rationalized and multi-perspective customer-focused business processes. As VSM workshop sessions progress, participants gather critical data related to product and process design and manufacturing, including bills of material, product flow, work-cell and equipment definition and target Takt time, throughput, and quality expectations. Although 46% of survey respondents still capture this data via pencil and paper or rely on spreadsheets, the data becomes a snapshot, relevant for a moment in time and does not provide a moving picture that monitors processes over time.

Figure 6: Current Use of Automation in Support of Lean – Shop Floor



Source: AberdeenGroup, August 2006

Streamlining the Value Chain with Lean Supply Chain

Manufacturers are realizing that excelling at Lean manufacturing is not enough from a customer perspective. The need to provide differentiated service when capturing customers and delivering products is pushing the demand for IT solutions that support streamlined and integrated Lean value chain processes. Accordingly, Aberdeen research has shown a consistent trend for IT solutions with the greatest impact on Lean strategies as customer facing: "integrated manufacturing and logistics solution" and "integrated order configuration/management and manufacturing solution." The key words are "integrated" and "solution," which means the combination of business process and supporting applications that are designed to streamline and synchronize the customer acquisition and delivery processes.

> Manufacturers today need to take a more integrated approach to managing the complexities of manufacturing in relationship to the supply chain.

For instance, a mid-sized automotive supply manufacturer implemented Lean and supporting solutions to streamline and synchronize its build-to-order and deliver-to-order supply chains. The manufacturer had manufacturing and order consolidation sites across North America that operated in a pull environment. Its Lean supply chain produced only to order and carried no inventory; it also did not have room for inventory at the consolidation centers. Thus, the manufacturer needed an IT solution that would essentially "load level" the entire supply chain to ensure that orders produced across North America came together at the right time and did not overwhelm the limited space and process capacity

of the consolidation centers. The company took a two step approach by incorporating a custom solution combined with Lean techniques and scorecards visible throughout the supply chain. However this manufacturer is one of many that are running on a "hodge-podge" of custom solutions that carry their own set of complexities and integration issues.

Chapter Three:
Implications & Analysis

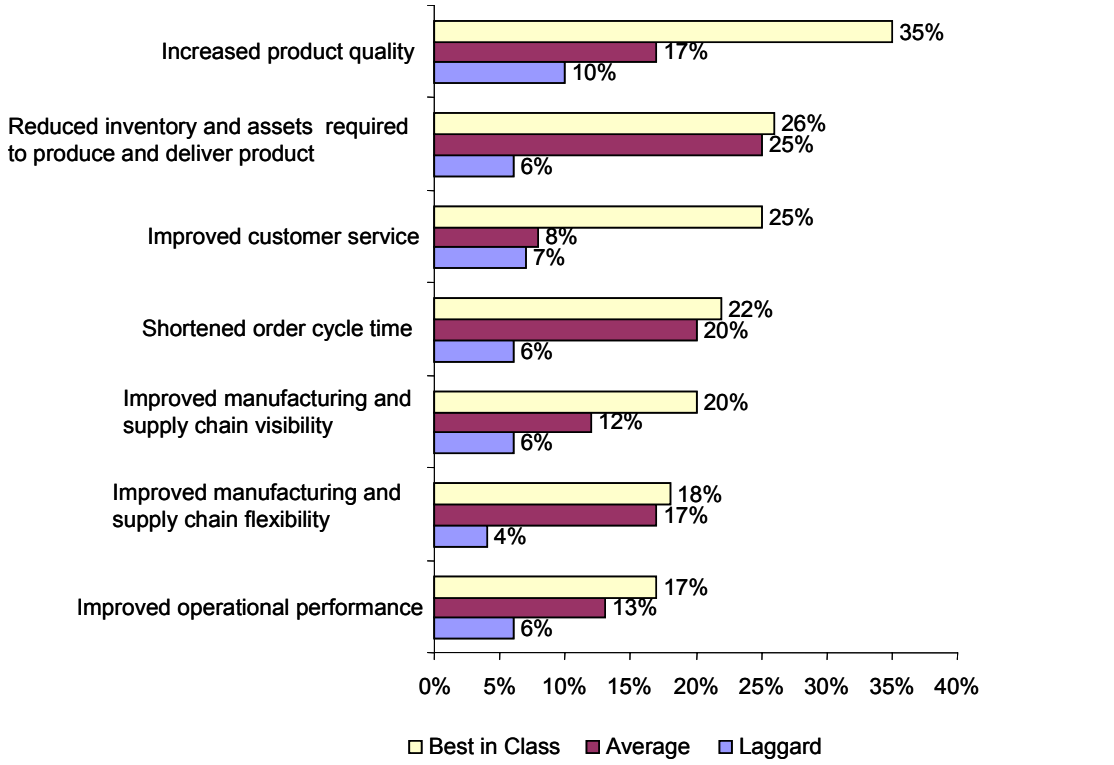
Key Takeaways

- Pushing Lean beyond the four walls of manufacturing is leading to dramatic Best in Class success—Beyond their initial expectations.
- Best in Class performers are able to quantify the value of Lean and measure their efforts towards initial investment with ROI at 33%.
- The customer focus continues with Best in Class scoring highly on value-adding differentiators, bringing the value to the customer.
- Technology solutions are playing an increasingly important part in terms of institutionalizing processes, improving productivity, and helping to drive culture change.

Companies that have mastered Lean basics are meeting or exceeding shareholder expectations. The Best in Class in particular have consistently exceeded their initial expectations for Lean in key areas such as the reduction of inventory and assets, manufacturing and design cost reductions, improved manufacturing and supply chain flexibility, improved product quality, and improved customer service (Figure 7). These strongest performing companies have not only embedded Lean techniques into core business processes, but have also institutionalized these processes with technology solutions, integrated Kaizen programs (for continuous improvement) into their culture, developed leaders with strong mentoring capabilities, and continue to drive operational excellence by remaining focused on key measurements.

> "We have been able to reduce obsolete inventory, and we've found the closer you can get to your demand signal and manufacturing process the less materials you will have to abandon."
>
> -Don Alvine, Vice President Supply Chain Management , Agere Systems

Figure 7: Benefits -Exceeding Expectations



Source: Aberdeen*Group*, August 2006

Stacking Up Against the Competition

Aberdeen has developed a competitive framework that helps determine success factors for laggard, industry average, and Best in Class performers. Survey respondents were evaluated on five criteria: process, organization, knowledge, and technology. Table 1 allows companies to review how their organization stacks up relative to Lean supply chain:

Table 1: Aberdeen Competitive Framework for Lean Supply Chain

	Laggards	Industry Average	Best in Class
Process	Lean techniques implemented but limited to the shop floor; little or no extensions of Lean elsewhere in the Enterprise.	Most production facilities in some state of Lean. Some extension of Lean philosophy and techniques to cross-functional areas like suppliers, but not an enterprise-wide strategy.	Lean philosophy and techniques under Enterprise control; measurements and controls throughout the plant and extensions to procurement, logistics, and customer services.
Organization	Lean value stream mappings and organization limited to manufacturing departments within plants and factories with little co-ordination with supply chain departments or partners.	Some value stream mappings extend beyond production into supply network operations. Value stream leaders are cross-functional.	Lean culture in DNA of entire Enterprise. Value stream mappings are cross-functional, extending beyond manufacturing to most departments.
Knowledge	Lean value stream leaders for production but no Enterprise 'Lean' change agents.	Some Lean expertise outside of production; some movement into other departments.	Enterprise-wide Lean program office with cross-functional value stream leaders.
Technology	Plant and factories partially automated; most Lean techniques still supported via manual or white board tools or excel.	Production operations are partially to fully automated (e-Kanban); some degree of integration with enterprise and across facilities.	Web-based and enterprise-focused automation. Lean technology enablers are identified and implemented across various enterprise functions.
Performance Metrics	Plants and factories measured on traditional production metrics such as throughput and unit cost.	Traditional production metrics as well as some financial metrics and KPI's are utilized.	Cross-functional and synchronized Production, Financial, and Value Stream metrics and KPIs. Strong visibility and consistency of metrics to most employees.

Source: AberdeenGroup, August 2006

Driving Performance-Key Metrics of the Best in Class

As Best in Class drive ROI from their Lean endeavors, the focus on the customer is still paramount, with Best in Class well exceeding both average and laggard companies on key performance metrics (Table 2). Some of the key metrics highlighted below serve as a representation of KPIs that can be monitored by all manufacturers, although companies need to place priority on measuring KPIs that may vary across industry like yield, manufacturing cycle time, and days in inventory. Best in Class manufacturers that are extend-

ing Lean throughout the supply chain network and involving logistics providers and customers are tying the value back to their Lean initiative and serving to differentiate themselves in the market as well. Following the Lean mantra means going beyond traditional metrics and delivering value by driving out waste and inefficiency and flexibly adapting to customer demands.

Table 2: Current Performance-Best in Class, Average, Laggard

Current Performance	Best in Class	Average	Laggard
Schedule Compliance	**88%**	80%	80%
ROI (%)	**33%**	26%	23%
Order Fill Rate (%)	**99%**	89%	80%

Source: AberdeenGroup, August 2006

Driving Operational Performance with Business Process Standardization and Metrics

Much of the success attributed to Lean is based on its unrelenting focus on process standardization and continually looking for ways to improve. Process standardization requires performing the same task time and time again, measuring standard performance on that task, and continually investigating ways to improve future performance. This premise is based on the ability to measure, set standards, and work toward improved performance. While supply chain processes are susceptible to change, ensuring a standard and measurement to a standard are good steps in ensuring process improvement and return on Lean investment.

Table 3: Implications – Strategies for Lean Supply Chain

Implications-Strategies for Lean Supply Chain	All Respondents
Moving to Kanban to reduce raw material inventories, shorten supplier lead times and improve supplier on-time delivery performance	55%
Using other techniques to synchronize inbound supplier material	50%
Working with distribution and logistics to improve coordination around outbound material flow to customers	50%
Working with suppliers to improve product design, reduce the number of raw material SKU's	43%
Working with suppliers to improve coordination around new product introductions	40%

Source:
AberdeenGroup, August 2006

Table 3 highlights the implications and manufacturing enterprise strategies toward Lean supply chain. It comes as no surprise that a majority of manufacturers (56%) are trying to coordinate their raw material inventories and to synchronize lead times with suppliers via Kanban and e-Kanban approaches. It is also encouraging to find 50% of respondents are working toward both synchronizing inbound supplier materials as well as synchronizing distribution and logistics outbound material flow. Product design and new product introduction programs enhanced by Lean concepts are driving momentum as manufacturers look to make the design-to-production cycle more efficient.

The Role of Technology

While early Lean adopters were pleased with the flexibility that paper and pencil provided, there have been a number of factors that are making "technology-less" implementations impractical for a number of reasons:

- Customer expectations continue to escalate, driving the need for additional variations to existing products, faster launches for new products, and decreased order cycle times; this requires increased flexibility in existing plants, with suppliers, and across the supply chain.
- Pricing pressures have driven many manufacturers to outsource production, which has resulted in a lack of visibility into foreign operations; this is driving the need for web-based solutions that enable decision makers to see and control key operations remotely.
- Leading companies are scaling and extending their Lean processes beyond a single plant to encompass supply chain partner processes; this is driving the need for a technology infrastructure that facilitates the design and implementation of customer-focused business processes.

> There has to be a greater reliance on enabling technology… We've had parts and supplies coming from Korea and Taiwan and two different vendors in Japan for a product that needed to be assembled in Bangkok, only to be delivered to a customer in China. The only way we were able to do this and deliver to the customer when they request it has been through leveraging enabling technology.
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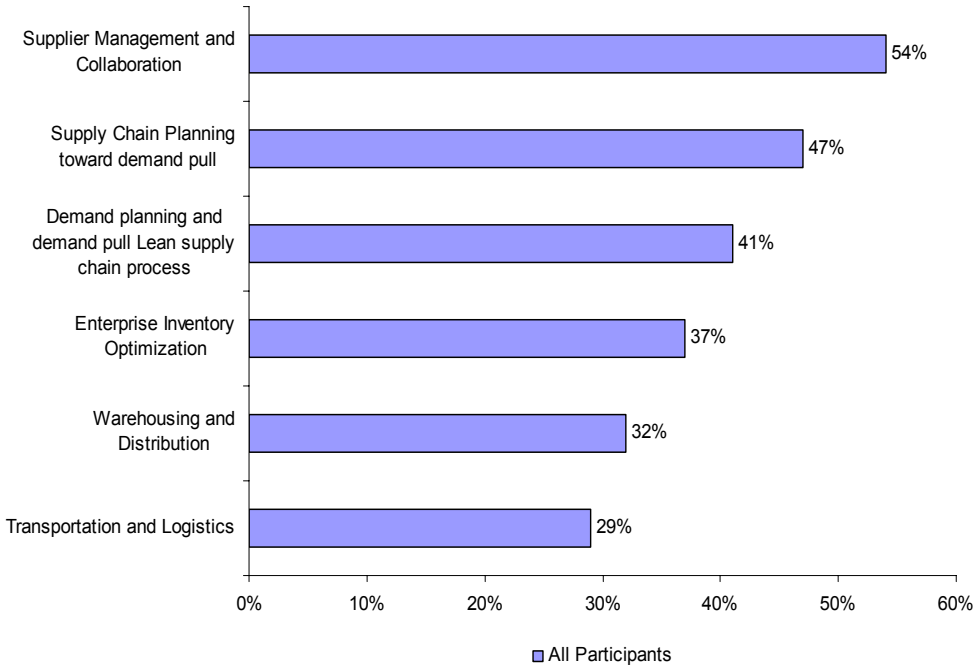
> --Don Alvine, Vice President Supply Chain Management , Agere Systems

As another way to pinpoint opportunities for Lean, this survey asked manufacturers with Lean initiatives to identify their top areas of the supply chain 'ripe' for Lean adoption.

Figure 8: Top Functional Supply Chain Areas Ripe for Lean Adoption



Source: AberdeenGroup, August 2006

Figure 8 illustrates the tendencies of Enterprises looking to extend their Lean initiatives. Clearly, the emphasis is on supplier collaboration opportunities coupled with inventory optimization and process efficiencies across the supply chain. As Enterprises map a course of Lean through the supply chain, they must take into account the following process and technology dependencies:

- Business process improvement through standardization with interwoven Lean concepts embedded into the fabric of supply chain business processes
- Implementation of a cohesive technology infrastructure
- Standardized KPI's for all nodes in the supply chain
- Delivery of actionable real-time data and event management with intelligent response
- Management of centralized data knowledge repositories for supply chain

Table 4: Current and Future Lean Technology Plans for Lean Deployment

Current and Future Technology Plans for Lean Deployment	Currently Use	Plan to Use within 12 Months	Plan to Use within 12 to 24 Months
ERP	**60%**	13%	10%
Supplier Relationship Management/Procurement Software	**26%**	19%	13%
Enterprise Management Software (Outside ERP)	**20%**	14%	10%
Supply Chain Management	**48%**	29%	27%

Source: AberdeenGroup, August 2006

In terms of deploying Lean supply chain strategies, manufacturers will seek to minimize both cost and risk by strengthening and extending existing systems like ERP as well as examining new technology solution enablers (Table 4). Major technology enablers include ERP solution extensions outside of core ERP such as Supply Chain Planning, Supply Chain Execution, Visibility and Event Management, Analytics, and Business Intelligence, as well as continued data integration. A significant 56% of responding Enterprises are planning to use Supply Chain Management (SCM) enabling technology beyond their legacy ERP systems to facilitate Lean supply chain, a clear mandate and opportunity for SCM vendors. Those manufacturers planning to use Supplier Relationship Management capabilities in enabling Lean supply chain (32%) is also noteworthy.

> "After consolidating all of our systems to SAP and implementing a supply chain management module, we have been able to streamline our operations, **with a 36% reduction in cost.**
>
> - Manfred Bundschuh, Quality Manger, ThyssenKrupp Automotive STC

As a case in point, Kaman Industrial Distribution saw the need for supplemental enabling technologies to facilitate its Lean supply chain initiatives, and took a proactive approach toward leveraging its existing technology with additional home grown capabilities. Kaman is a large manufacturer and distributor of power transmission, motion control, electrical components, and a wide range of bearings. Given the nature of its business, it is highly dependent on its supply chain to offer unique service and value. The company needed to look into the interdependencies with supply chain partners and supplier inventories, as well as outbound logistics. Kaman developed a series of supply chain visibility capabilities, as well as warehousing and cross-docking capabilities as part of their 'Act Now' Lean initiatives and alignment of their kaizen events toward immediate customer demand. These technologies helped to streamline the Lean supply chain efforts, resulting in significant savings in warehouse workforce reduction (50%). Kaman has developed a set of metrics called the 'Index of Process Accuracy' toward achievement of the perfect order, and is reaping significant benefits relative to on-time deliveries and order cycle time.

ERP Solutions

Traditional ERP solutions are designed to manage back office business processes across the enterprise, in addition to the manufacturing operations solutions that have already adapted to Lean concepts and techniques. Over time the application footprint provided by ERP solution providers has grown to encompass customer and supplier facing functions, as well as business intelligence and corporate performance management. In addition, some of the larger players in this field have developed or acquired solutions which were previously viewed as best-of-breed add-ons for supply chain planning, supply chain execution, supply chain visibility and event management, supply chain network analytics, and supply chain performance. Therefore, ERP vendors are well positioned today to offer solutions in support of 'Leaning out' supply chain activities, and will always have the 'integration' wild card to play to their advantage.

> "We're trying to fully integrate SAP enterprise-wide, and are coordinating efforts to move to a demand flow environment following the best practice example of one of our facilities which is operating on an SAP platform."
>
> -Bill Owad, Senior Vice President Operational Excellence, Cardinal Healthcare

Case in point, one of our Best in Class respondents, Cardinal Healthcare, a force in pharmaceutical manufacturing and distribution, medical devices, and clinical technologies is embarking on a cross-enterprise implementation of SAP in all divisions. Coincidentally, they are proceeding with a nearly two year old Lean initiative both in the plants and with extensions across the supply chain. Both efforts are a part of Cardinal Health Care's enterprise-wide 'Operations Excellence' initiatives using components of Lean philosophy, concepts, tactics, and enabling technologies to achieve its goals. Fundamental components of the Lean program are moving the organization to a demand-flow paradigm, establishment of product focus teams, and value stream mappings based on a site level product line operations from supplier to customer. Using the Clinical Technologies unit as a model, they intend in the near future a convergence of the parallel projects in order to best utilize SAP's *mySAP ERP* solution platform as an enabler for their Lean objectives.

Real Value Derived from Lean Concepts and Technologies Applied through the Supply Chain

'Lean' manufacturing tools and techniques can be extended beyond the Shop Floor to processes that are unique to and transcend efficient production operations and supply chain systems. The extension of Lean manufacturing concepts across the supply chain network of suppliers, customers, and partners can result in real value creation for the savvy enterprise. As market demand fluctuates, the ebb-in-flow effect throughout the supply network must be monitored and accounted for just as internal constraints are monitored on the shop floor. Given the correct balance of production optimization with supply chain network synchronization, real and significant value can be derived from the extension of 'Pull' Demand with 'Lean Manufacturing' tools and concepts. The results

can be exponential in nature across the entire supply chain network of supplier, manufacturer, and customer participants.

Analysis and Implications:

- Supply Chain Management has evolved beyond Linear Interactions to 'Networked
- Processes' between trading partners
- Enterprises are moving beyond production optimization to synchronization of business processes
- Lean tools and concepts transcend manufacturing operations to the extended supply chain network

Extended supply chain efficiencies will emerge as "Pull" scheduling mechanisms from manufacturing are deployed. Real value creation can be found via the extension of Lean manufacturing concepts across the supply chain network of suppliers, customers, and partners.

> "As a result of SAP and in conjunction with SupplyWEB, suppliers are able to monitor our inventory levels. We also receive broadcasts from Chrysler to begin production, and as a result we are now 12 hours ahead in our scheduling. "
>
> -Lawrence Hendricks, Manager, TRW Toledeo

With the advent of the Web as a major means of conducting business transactions and business-to-business communications, coupled with evolving web-based supply chain management technology, we are witnessing a transition stage from 'linear' supply chain models to 'networked' supply chain models. Enterprises are moving toward real-time operations by sharing information and interlacing processes with trading partners. While enterprises have spent recent years and millions of dollars optimizing and connecting the supply chain, further innovations and investments are expected. Enterprises are under continued pressure to work more closely with trading partners to stay even or gain advantage over competitors. The technologies to enable dynamic process changes and real time interactions between extended supply chain participants is emerging and being deployed at an accelerated pace.

Enterprises will blend internal production and supply chain processes with those of their external trading partners. Supply Chain 'Champions' and 'Channel Masters' will drive partners toward a common set of business processes. Participating organizations will focus more on fulfilling the requirements of the end customer, rather than the limited focus on what its direct 'intermediate' customer requires. Linear interactions will give way to interactions that occur in parallel. Businesses are evolving toward the concept of the 'virtual enterprise', working together toward a common set of customer-driven goals. To achieve the desired results, enterprises with networked multi-enterprise supply chains need to form alliances and deliver to specific customer requirements brought forth via a customer driven Demand-Pull paradigm. Supply chain management will need to become more about information exchange among the entire supply chain, and requires much more than limited point-to-point integration with a select few partners. As manufacturing

operations embrace and adopt 'Lean" manufacturing concepts and tools within their production operations, they are also refining the meaning of, and means for SCM. Within the context of a 'Lean' supply chain, SCM entails any step, process, or movement of product in which value is gained or lost. The impact on suppliers and customers alike can range from subtle to significant.

Supply Chain Management

Each of the categories of supply chain management software below are expected to contribute to enabling Lean supply chain capabilities as manufacturers strengthen their supply chain infrastructure and tighten processes and standards toward Lean. Some supply chain applications vendors specialize in a particular category of software, and others offer combinations of the categories.

> "When we drill down into any ERP initiative and focus on the right metric, we can then squeeze out all excess cost, waste, and redundancy out of our processes to make the most efficient process possible."
>
> -Charles King, Director Continuous Improvement, Kaman Industrial Technologies

Supply Chain Planning

The determination of a set of policies and procedures that govern the operation of the Lean supply chain, including marketing channels, product and promotional quantities and timing, production, inventory and replenishment policies for Lean demand-pull and flow operations. Enterprises embarking on Lean initiatives often find that the most difficult step in transforming its business processes is the transformation to a demand-pull model. Most enterprises have been driven to a 'push' approach dictated by their legacy homegrown application technology or a purchased ERP package. The transition from a 'Push' model to a demand-pull approach has been addressed by some SCP (Supply Chain Planning) vendors, but demand-pull was not really the basis of their core software applications in planning and forecasting.

Supply Chain Execution

The traditional set of warehousing operations and warehouse management, transportation and logistics, as well as distribution network execution functions are some of the touch points of Lean adoption. Several more mature enterprises embracing Lean through its supply chain have targeted Lean logistics as a particular strategy to eliminate waste and make all resources associated with distribution more efficient. Lean logistics got its start as the inbound logistics function supporting Lean production. It emphasizes frequent delivery, leveling inbound and outbound flow, and cutting inventories. Warehouses are another area of Lean opportunity. Case in point, the recent example of an Eastman Kodak department who was able to eliminate 130 pallets of raw materials inventory in the first week of the company's Lean cross-docking project. Why go through the traditional warehousing processes of 'receive-inspect—put away-store-retrieve' when there are opportunities to cross-dock directly to an outbound order?

Supply Chain Visibility and Event Management

Supply chain event management is a set of integrated supply chain functionality across five business processes including monitor, notify, simulate, control, and measurement that enables intelligent response to stimuli coming from manufacturing operations and supply chain activities. This category of enabling technology has been particularly appealing because it can be implemented independently of ERP, is cost effective, and provides the applications necessary for enterprises to examine and measure Lean activities through the supply chain.

Case in point: Agere Systems, a leader in integrated circuit solutions for mobility, storage, and telecommunications initiated a semi-fabless production strategy outsourcing key steps of its supply chain to strategic suppliers. Agere adopted a Lean strategy to hasten planning cycles, improve asset management across its supply chain, and provide for better response to customer demand. Agere implemented the *E2open Manufacturing Visibility Solution* (as a Software as a Service) in order to bridge the gap between its back-office systems and its strategic suppliers' systems, providing a view of outsourced manufacturing operations. The company now has visibility into its' supplier's material lots to the through IC fabrication, testing, and assembly to finished goods. The solution serves as a supply chain hub, providing visibility to key process points within a supplier's operation, as well as decision support and reporting to monitor key business indicators and trends. Agere states that the technology allows them to share internal and external data efficiently, allowing for increased flexibility and visibility of supply chain operations such as inventory, forecast, and PO (purchase order) activity. As to the implementation of e2Open, Don Alvine, Vice President of Supply Chain Management stated "When we started this process we had numerous suppliers feeding us information in different ways…We had staff dedicated to trying to figure out how to integrate the data, but now e2Open takes all the data from these disparate systems and rationalizes it into one usable format for us and drives it into our ERP. Our suppliers then can use this for acknowledging shipping alerts, and it doesn't matter what system they are on or we are on, what matters is the integration tool."

> Our suppliers can use this (data) for acknowledging shipping alerts, and it doesn't matter what system they are on or we are on, what matters is the integration tool."
>
> -Don Alvine, Vice President Supply Chain Management, Agere Systems

Supply Chain Analytics, Business Intelligence

Exploding volumes of data from the plant floor to the boardroom and the need for real-time decision making at all levels of operations and throughout the business are creating an unprecedented need for analytics and decision support tools. With the drive for improved integration of business processes and the application of Lean techniques beyond the plant floor, it is imperative for companies to take previously disparate manufacturing, supply chain, and financial planning functions and produce a single source of the truth. Measurements, metrics, and Key Performance Indicators (KPIs) are tools and concepts that are often associated with Lean, but seldom used correctly. The result too often is

that the Lean project objectives never reach expectations which likely were not established properly in the first place. Here are a few of the concepts to remember when implementing Lean manufacturing tools and concepts through your supply chain:

Metrics must be tied to strategies, goals, and objectives. Lean projects need to be funded and driven by a set of consistent strategies, goals, and objectives with pre-defined metrics that are tied to them. Typically departments, especially the plant floor, have measurements developed that isolate productivity measures. Supervisors develop metrics to optimize flow through the individual cells and, in some cases, use these as pay incentives. If KPI's are isolated they likely will not be helpful to the overall extended enterprise. At a recent World Economic Forum in Davos, Switzerland the Textile Industry made a case for removing all cell productivity measures that did not have a link to the overall extended enterprise. As Lean philosophy has always dictated, metrics need to be based on value stream activities and goaled toward customer satisfaction.

Systems Integrators and Consultancies

The adoption of Lean philosophy, tools, and techniques on the shop floor and across the Lean supply chain has been heavily reliant on internal and external consulting for training and the mentoring of Lean value stream leaders. The use of systems integration services professionals for enabling technologies and the extension of Lean across the supply chain is prevalent throughout Best in Class. Over time, it is incumbent on senior management that external dependencies are replaced with internal expertise.

Lean Specialty/MES Solutions

Lean Specialty and MES solutions play an important role in the daily operations of many Lean manufacturers, particularly in high-volume or highly complex production environments. These solutions are designed to publish weekly schedules and daily sequences; to manage the flow of product; and consistently collect shop floor data relative to material flow, process and component traceability, resource performance, and quality conditions.

They are often supported by barcode and wireless technologies, and combined with electronic Kanban, sending triggers upstream and to suppliers as materials are consumed. Operations Execution's (MES) characteristics help in optimizing production by applying directive applications that guide the execution and validation of a manufacturer's production. Operations Execution's resulting genealogy data collection and analysis can help optimize flow of work resulting in increased productivity and efficiency. Combining MES technology with Lean enables the collection of data needed to optimize new product and operations process changes. In addition, Operations Execution supports the alignment of scheduling, inventory management, logistics, quality and maintenance. MES can also offer real-time monitoring and visibility across the integrated supply chain. With MES's real-time enterprise visibility capabilities, a company might react to a quality problem at one plant by routing orders to a second plant for timely fulfillment. MES's dashboard review of performance metrics lets supervisors and managers look at differences between the two sites to diagnose issues. Implementing a Lean approach supported

by Operations Execution's (MES) enabling technology supports a manufacturer's need to adjust to changes in market demands in a much quicker, less disruptive way than make-to-stock or just-in-case manufacturing approaches. This solution also facilitates root cause analysis and corrective action, including a formalized process for issues notification and problem resolution reporting that extends back to the supplier base.

Chapter Four: Recommendations for Action

Key Takeaways

- Laggards should start by stabilizing their shop floor Lean initiatives; then target 1 - 3 best case opportunities for extension of Lean on the supply side.
- Industry average companies should create a culture of Lean beyond the shop floor, and look for pilot areas to transcend Lean into the supply and distribution networks.
- Best in Class organizations should balance long-term strategy and short-term results, and improve supplier collaboration.

Manufacturers that apply a Lean strategy to all areas and initiate its use top-down and bottom-up, are most likely to be an industry "Best in Class" performer. It is no surprise that top management commitment is also critical to take Lean practices broad and deep. Manufacturers need to transfer Lean knowledge from the hands of a few experts on the shop floor to the entire workforce including the supply chain, to rapidly scale Lean practices throughout the company and the supply chain. The goal is to accelerate the learning curve to achieve mature status in less time than it has traditionally taken. Mature users of Lean strategies are almost three times as likely to be industry "Best in Class" performers than manufacturers that have not yet reached this level of maturity.

When Leaning-out your supply chain, focus closely on the following recommendations:

- Include major suppliers, customers, and partners as part of the audience during the transition to 'Lean' concepts, both in production operations and as they are deployed across the supply chain
- Pick 1 to 3 vendors to work with as a pilot
- Find out which vendors can carry inventory in the short term
- Evaluate each supply chain process as to applicability of Lean concepts. Evaluate processes specific within the enterprise and cross-enterprise
- Project planning and deployment strategies for 'Lean' concepts must include Impact and Integration with networked partners
- Performance Measurements that span the Supply Chain Network must be incorporated. Measure quality, cost and delivery performance.
- Build mutually beneficial relationships with partners to share information and synchronize planning activities driven by customer demand characterized by 'Pull' demand concepts
- Build the correct supply network, including the supply side component, to prevent stock out, excess stock buffers, and replenish on demand
- Strive for agile, same-day manufacturing execution capabilities with minimal variability in order to meet real customer demand
- Integrate IT applications for synchronized business processes that connect customer demand to business execution

Laggard Steps to Success

By defining value in the eyes of the customer and deploying key Lean tools and techniques across the supply chain, lagging companies will create an opportunity to significantly improve operational performance and customer satisfaction while reducing operating costs.

1. *Map the value stream from the customer to the supplier.*

   Identify the specific resources and actions required to deliver a specific product to a specific customer including the supply and distribution network of resources. Create a future state of the value stream map. Identify and categorize waste in the current state, and eliminate it.

2. *Improve organization of the work environment.*

   Commit to developing a more professional work environment by aggressively implementing the 5S's (sort, set in order, shine, standardize, sustain) in manufacturing, and pushing out these techniques into selective supply chain activities like supplier sourcing.

3. *Prove results and look for new opportunities.*

   Measure key indicators such as yield, throughput, and quality before and after the plant-specific Lean pilot. Once a pilot has been operational, promote team results to management and look for additional opportunities to "Lean out" operations in the immediate supply chain.

Industry Norm Steps to Success

Companies reporting average performance results also have an opportunity to create a culture of Lean and extend Lean techniques into other areas of manufacturing and out to supply chain partners.

1. *Permeate a culture of Lean beyond your four walls and into the supply chain.*

   Eliminate functional barriers by creating customer-focused cross-functional teams that are accountable for entire processes both within and outside of manufacturing. Grow leaders and teams who thoroughly understand the work, live the philosophy, and teach it to others throughout your supply and distribution networks. It is these teams that will make you Lean supply chain pilots and ongoing efforts successful.

2. *Pilot both supply network and distribution network kaizen events.*

   Achieving Lean supply chain results begins with establishing a culture of Lean throughout the supply chain, and initiating innovative ways to embrace the philosophy with enabling technology. Identify opportunities, and look toward rapid implementation through technology enablement

3. *Conduct Supply Chain Kaizen blitz workshops.*

   Kaizen workshops are cross-functional in nature, focused on continuous improvement, and conducted over one to five days. The goal of the workshop is to rapidly refine solutions to highest priority issues; workshops can be focused on

either value stream improvements or on the elimination of waste. Because this is a well documented and structured process, consider training an internal leader or hiring an external consultant. Organize and prioritize Kaizen improvement efforts along the value stream to ensure that focused improvement efforts deliver value to the highest impact business areas.

Best in Class Next Steps

Companies that have achieved competitive differentiation through operational excellence still have the opportunity to continue to improve and extend their lead even further.

1. *Raise the Performance Bar with specific Lean Supply Chain metrics*

   If metrics are not a part of your value stream mapping for a Lean supply chain, they need to be as a means of tracking effectiveness and ROI; Metrics complement any Lean initiative and culture. Postponement, delivery cycle times, Warehouse / DC efficiencies, returns, logistics costs, are all candidates for Lean Supply Chain metrics.

2. *Improve supplier and logistics collaboration*

   Leverage technology to enable suppliers' visibility into planned shipments, demand forecasts, and production schedules. Work collaboratively with logistics channels to ensure that full value is delivered without surprises to the mutual end-customer.

3. *Balance long-term strategy and prepare for change.*

   Although immediate results can be gained implementing rudimentary Lean techniques in manufacturing and the supply chain, more dramatic and positive change happens over time (multi-year commitment) and with enabling technologies to streamline effectiveness. Preparing a Lean supply chain that is flexible and capable of rapid response to change will ease the burden of business events like mergers and acquisitions.

4. *Prepare for more frequent and stringent product launches that include supply chain implications.*

   Integrate engineering, manufacturing, and supply chain processes and systems to more effectively support Lean. Exploit the process data and knowledge developed in the value stream context to facilitate process engineering design, process portability, supply chain serviceability, and reduced risk during pilot production and distribution ramps. With the demand for more frequent product launches, will come increased expectations that the transition will happen rapidly and seamlessly; this will require orchestration of processes between engineering and manufacturing.

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As an analyst and editor for the Manufacturing Services research area at AberdeenGroup, Maura Buxton is involved in providing analytical insights to better serve enterprises. Through evaluating the best models in the industry, Maura offers actionable methods to enhance business processes and integrate leading advancements into supply chain networks.

Before joining AberdeenGroup, Maura was involved in analysis at Pert Survey Research in Bloomfield, Connecticut, interpreting quantitative results on leading brands in the alcohol beverage industry. Her reports centered on industry insights and opportunities, brand awareness relative to competitors', and strategic initiatives that allowed companies to grow their consumer bases. Maura received her bachelor's degree in advertising, marketing, and public relations at Emerson College in Boston, Massachusetts.

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Appendix A:
Research Methodology

During the month of July 2006, Aberdeen*Group* examined Lean manufacturing philosophies, techniques, and technologies of 308 enterprises in aerospace and defense (A&D), automotive, high-tech, industrial products, and other industries.

Responding supply chain, logistics, and operations executives completed an online survey that included questions designed to determine the following:

- What is driving manufacturers today to adopt Lean? What are their business needs and expectations?
- How are Best in Class implementing Lean? What are their critical success factors and how are these being measured?
- What tools, techniques, and technology solutions are leaders using to deploy and scale their Lean operations?

Aberdeen supplemented this online survey effort with telephone interviews with select survey respondents, gathering additional information on Lean strategies, experiences, and results.

The study aimed to identify emerging best practices for Lean and provide a framework by which readers could assess their Lean capabilities.

Responding enterprises included the following:

- ***Job title/function****:* The research sample included respondents from the following functional areas: manufacturing (26%); business process management (13%), logistics/supply chain (24%), IT (4%), and others. Job titles included managers (34%), directors (22%), C-level or senior managers (10%), and others.
- ***Industry****:* The research sample included respondents predominantly from manufacturing industries: Industrial equipment manufacturers (20%) of the sample, automotive (41%) and finally aerospace and defense manufacturers, accounting for (14%) of the sample. Other sectors responding included medical equipment, construction/engineering, and retail and distribution.
- ***Geography****:* Nearly all study respondents were from North America, including 79% from the U.S. alone. Remaining respondents were from the United Kingdom and the Asia-Pacific region.
- ***Company size****:* About 43% of respondents were from large enterprises (annual revenues above US$1 billion); 33% were from mid-sized enterprises (annual revenues between $50 million and $1 billion); and 24 % of respondents were from small businesses (annual revenues of $50 million or less).

Solution providers recognized as sponsors of this report were solicited after the fact and had no substantive influence on the direction of the *2006 Lean Benchmark Report*. Their sponsorship has made it possible for Aberdeen*Group*, *Manufacturing Business Technology,* and Managing Automation to make these findings available to readers at no charge.

Table 5: PACE Framework

PACE Key

Aberdeen applies a methodology to benchmark research that evaluates the business pressures, actions, capabilities, and enablers (PACE) that indicate corporate behavior in specific business processes. These terms are defined as follows:

Pressures — external forces that impact an organization's market position, competitiveness, or business operations (e.g., economic, political and regulatory, technology, changing customer preferences, competitive)

Actions — the strategic approaches that an organization takes in response to industry pressures (e.g., align the corporate business model to leverage industry opportunities, such as product/service strategy, target markets, financial strategy, go-to-market, and sales strategy)

Capabilities — the business process competencies required to execute corporate strategy (e.g., skilled people, brand, market positioning, viable products/services, ecosystem partners, financing)

Enablers — the key functionality of technology solutions required to support the organization's enabling business practices (e.g., development platform, applications, network connectivity, user interface, training and support, partner interfaces, data cLeansing, and management)

Source: **Aberdeen***Group*, August 2006

Table 6: Relationship between PACE and Competitive Framework

PACE and Competitive Framework: How They Interact
Aberdeen research indicates that companies that identify the most impactful pressures and take the most transformational and effective actions are most likely to achieve superior performance. The level of competitive performance that a company achieves is strongly determined by the PACE choices that they make and how well they execute.

Source: **Aberdeen***Group*, Month 2006

Table 7: Competitive Framework

Competitive Framework Key
The Aberdeen Competitive Framework defines enterprises as falling into one of the three following levels of manufacturing practices and performance: *Laggards (30%)* — Lean manufacturing practices that are significantly behind the average of the industry, and result in below average performance *Industry norm (50%)* — Lean manufacturing practices that represent the average or norm, and result in average industry performance. *Best in class (20%)* —Lean manufacturing practices that are the best currently being employed and significantly superior to the industry norm, and result in the top industry performance.

Source: **Aberdeen***Group*, August 2006

Appendix B:
Related Aberdeen Research & Tools

Related Aberdeen research that forms a companion or reference to this report include:

- *Roadmap to Lean Success, Measurement and Control Benchmark Study, June,* 2006
- *The Lean Benchmark Report, Closing the Reality Gap, March,* 2006
- *Best Practices in Lean: The Momentum Builds,* July 2005

Information on these and any other Aberdeen publications can be found at www.Aberdeen.com.

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To be the trusted advisor and business value research destination of choice for the Global Business Executive.

Our Approach

Aberdeen delivers unbiased, primary research that helps enterprises derive tangible business value from technology-enabled solutions. Through continuous benchmarking and analysis of value chain practices, Aberdeen offers a unique mix of research, tools, and services to help Global Business Executives accomplish the following:

- IMPROVE the financial and competitive position of their business now
- PRIORITIZE operational improvement areas to drive immediate, tangible value to their business
- LEVERAGE information technology for tangible business value.

Aberdeen also offers selected solution providers fact-based tools and services to empower and equip them to accomplish the following:

- CREATE DEMAND, by reaching the right level of executives in companies where their solutions can deliver differentiated results
- ACCELERATE SALES, by accessing executive decision-makers who need a solution and arming the sales team with fact-based differentiation around business impact
- EXPAND CUSTOMERS, by fortifying their value proposition with independent fact-based research and demonstrating installed base proof points

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Founded in 1988, Aberdeen*Group* is the technology-driven research destination of choice for the global business executive. Aberdeen*Group* has over 100,000 research members in over 36 countries around the world that both participate in and direct the most comprehensive technology-driven value chain research in the market. Through its continued fact-based research, benchmarking, and actionable analysis, Aberdeen*Group* offers global business and technology executives a unique mix of actionable research, KPIs, tools, and services.