

Lean Scheduling and Execution

May 2007

~ Underwritten, in Part, by ~



Executive Summary

Under the ever-widening Lean umbrella, manufacturers are left grasping for what it means to be Lean, which aspects of today's Lean initiative are delivering tangible results, and where to turn for the answers to these questions. In response to these needs, *The Lean Scheduling and Execution Benchmark*, based on the survey responses of over 400 manufacturing enterprises, highlights the operational performance benefits that Best-in-Class manufacturers attribute to the use of Lean scheduling and execution principles.

Best in Class Performance

The value of Lean principles and technologies is tied to the results attributed to their use. In the following analysis, Aberdeen used three KPIs to distinguish Best-in-Class. Across these metrics Best-in-Class manufacturers averaged the following performances:

- **95%** On Time Delivery
- **91%** Throughput
- **79%** Reduction in Manufacturing Cycle Time

Competitive Maturity Assessment

Survey results show that firms enjoying Best-in-Class performance shared several common characteristics which include:

- Standardized Lean scheduling and execution best practices based on Continuous Improvement team findings.
- Autonomous Lean decision-makers enabled with actionable factory floor intelligence.
- Established Lean centers for excellence.

Required Actions

To achieve Best-in-Class performance, manufacturers must:

- Measure Throughput and Manufacturing Cycle Time at least daily.
- Measure On Time Delivery, WIP, and Scrap in real-time.
- Deliver factory floor data as actionable intelligence to Lean scheduling and execution decision-makers.
- Implement Lean Software Applications.
- Integrate Lean Software Applications with ERP and automate Lean tools.

Voice of the Manufacturer

Our company believes that Lean is a philosophy critical to the success of the entire enterprise – from quote to cash. Each component of the extended value chain can be optimized through the application of Lean tools, but it is the whole that must be integrated to realize the largest, long term improvements.

Derrell S. James
VP of Operations
Genicon

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Table of Contents

Executive Summary	2
Best in Class Performance	2
Competitive Maturity Assessment	2
Required Actions	2
Table of Contents	2
Table of Contents	3
Chapter One: Benchmarking the Best in Class	4
Aberdeen Analysis	4
Maturity Class Framework	4
Metrics Measured	5
Best in Class PACE Model	6
Chapter Two: Benchmarking Requirements for Success	8
Competitive Assessment	8
Organizational Capabilities and Technology Enablers	9
Chapter Three: Required Actions	11
Laggard Steps to Success	11
Industry Norm Steps to Success	11
Best in Class Steps to Success	12
Featured Underwriters	13
Infor	13
Preactor	14
SAP	15
Appendix A: Research Methodology	16
Appendix B: Related Aberdeen Research	19

Figures

Figure 1: Share of Best-in-Class Measuring KPIs	5
Figure 2: Share of Best-in-Class Facing Market Pressures	6
Figure 3: Share of Manufacturers Using Automated Lean Tools	10

Tables

Table 1: Top Performers Earn "Best-in-Class" Status:	5
Table 2: Best-in-Class PACE Framework	7
Table 3: Competitive Framework	8
Table 4: PACE Framework	17
Table 5: Maturity Framework	17
Table 6: Competitive Framework	18
Table 7: Relationship between PACE and Competitive Framework ..	18

Chapter One: Benchmarking the Best in Class

Aberdeen Analysis

This benchmark study showcases the operational performance benefits manufacturers are currently enjoying due to the adoption of Lean scheduling and execution principles. In the Lean universe, two of the major tenets are “continuous improvement” and “waste removal”, which in the eyes of many Lean purists leaves no room for technology adoption. Fortunately, a new generation of manufacturing professionals has come of age and is, to a large extent, implementing Lean scheduling and execution principles with an entirely new set of technology applications.

These newer manufacturers are just as vigilant as their predecessors; with a laser focus on reducing overall manufacturing costs. However, these manufacturers focus on more than the traditional pillars of Lean or TQM by concentrating on such things as integrating enabling technologies with ERP, synchronizing demand with execution, and smoothing production schedules. Finally, this benchmark shows which enabling technologies Best-in-Class manufacturers are using to improve KPI performance and ultimately reduce operating costs.

Maturity Class Framework

The value of Lean principles and technologies is tied to the results derived from use. In the following analysis, Aberdeen uses three KPIs to distinguish the Best-in-Class from Industry Average and Laggard manufacturers.

- On Time Delivery
- Throughput
- Manufacturing Cycle Time Reductions

A weighted average was defined and calculated based on these three KPIs, and the market was segmented with Best-in-Class manufacturers defined as the top 20% of performers, Industry Average manufacturers defined as the middle 50%, and Industry Laggard manufacturers defined as the bottom 30% of performers. The defined KPIs were chosen because they are standard calculations used across the manufacturing industry to measure specific aspects of scheduling or execution. Specifically, On Time Delivery measures how well demand management is connected to production execution; Throughput measures how well manufacturers are executing against schedules; and Manufacturing Cycle Time Reductions measures how well Continuous Improvement teams are improving the manufacturing process itself. When all three are considered in tandem, the overall success of Lean scheduling and execution initiatives becomes apparent.

Fast Facts

Best-in-Class Performance:

- 95% On Time Delivery
- 92% Throughput
- 79% Reduction in Manufacturing Cycle Time year over year

The top three KPIs measured by Best-in-Class manufacturers:

- On Time Delivery
- Throughput
- Manufacturing Cycle Time

71% of Best-in-Class manufacturers are focusing on Lean scheduling and execution to reduce overall manufacturing costs.

Table 1: Top Performers Earn “Best-in-Class” Status:

Definition of Maturity Class	Mean Class Performance
Best in Class: Top 20% of aggregate performance scorers	<ul style="list-style-type: none"> 95% On Time Delivery 92% Throughput 79% Reduction in Manufacturing Cycle Time year over year
Industry Average: Middle 50% of aggregate performance scorers	<ul style="list-style-type: none"> 91% On Time Delivery 87% Throughput 23% Reduction in Manufacturing Cycle Time year over year
Laggard: Bottom 30% of aggregate performance scorers	<ul style="list-style-type: none"> 78% On Time Delivery 60% Throughput 6% Reduction in Manufacturing Cycle Time year over year

Source: AberdeenGroup, May 2007

Maturity Framework Key

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

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

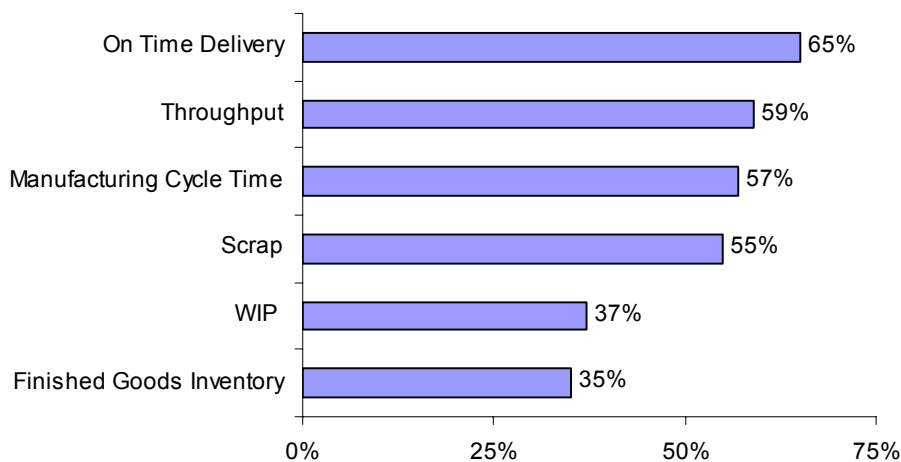
Industry norm (50%) — practices that represent the average or norm

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

Metrics Measured

On Time Delivery, Throughput, and Reductions in Manufacturing Cycle Times are essential to measuring success but are not all-inclusive. There are many other KPIs measured by the Best-in-Class. Insights gained by examining the second tier of KPIs can be just as valuable as the above analysis; especially when the findings shown below are considered in conjunction with the frequency of measurement findings in Chapter 2.

Figure 1: Share of Best-in-Class Measuring KPIs

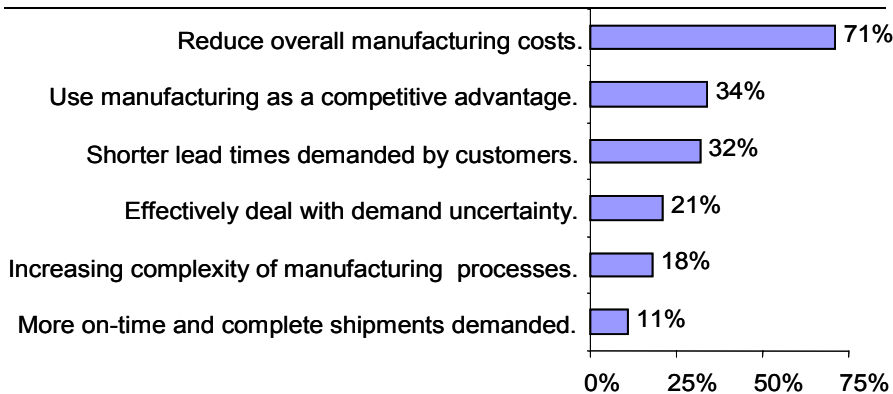


Source: AberdeenGroup, May 2007

Best in Class PACE Model

Aberdeen’s PACE framework enables Industry Average and Laggard manufacturers attempting to become Best-in-Class a structured way to understand how Best-in-Class manufacturers achieved their superior performance. Not surprisingly, among the highly competitive manufacturing markets, the number one force driving manufacturers’ focus on Lean initiatives is the pressure to reduce overall manufacturing costs.

Figure 2: Share of Best-in-Class Facing Market Pressures



Source: Aberdeen Group, May 2007

The stratification of the above graph is telling, as it shows Best-in-Class manufacturers are almost two times more likely to be focusing on the reduction of manufacturing costs than any other market pressure. This level of focus is impressive for an industry being pulled in so many directions; Lean can range from continuous improvement to synchronizing production with demand. However, as stated above, the main reason manufacturers use Lean principles is to reduce costs, regardless of Lean scheduling and execution.

PACE Key — For more detailed description see Appendix A

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

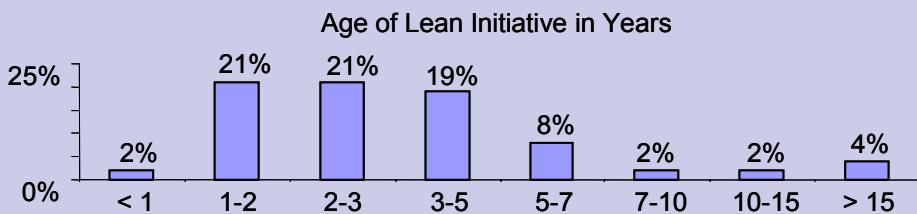
Actions — the strategic approaches that an organization takes in response to industry pressures

Capabilities — the business process competencies required to execute corporate strategy

Enablers — the key functionality of technology solutions required to support the organization’s enabling business practices

Aberdeen Insights – Best-in-Class Lean Initiatives

A surprising insight into Best-in-Class Lean initiatives is the amount of time that these manufacturers have been on the Lean journey. The overwhelming majority of Best-in-Class manufacturers’ Lean initiatives are only 1-5 years old and not more mature, which many readers may find surprising. Further analysis will show that the new generation of Lean journeyman may be outperforming the old because of their relative propensity to adopt technology in support of Lean scheduling and execution initiatives.



Best-in-Class manufacturers address the pressure to reduce costs by adopting Lean scheduling applications and integrating these applications with ERP. This integration provides the Lean Software Applications with the necessary supply chain visibility to synchronize production planning, execution, and demand. This integration also institutionalizes best practices across the organization, enabling scalability and solidifying long term success.

To ensure these strategic actions are successfully implemented, manufacturers use a host of Lean principles and tools. The following analysis will show that Best-in-Class manufacturers are generally more likely to automate these tools with Lean Software Applications.

Table 2: Best-in-Class PACE Framework

Pressures	Actions	Capabilities	Enablers
Reduce the overall cost of manufacturing.	Integrate Lean scheduling software, WIP reduction tools, and ERP. Extend Continuous Improvement team findings across the organization.	Lean scheduling best practices are standardized across the enterprise. Lean scheduling and execution is optimized by local decision makers. Internal Lean centers for excellence have been established within the organization. Factory floor data is delivered to decision makers as actionable intelligence.	Heijunka - Level Loaded production planning. Takt Time – pace of production synchronized to customer demand. Supermarket Sizing – inventory levels based on uncertainty of customer demand and attainments. Lot Sizing – optimized based on Takt Time and level loaded work cells. conWIP – constant work in process. Kaizen - supported by Dashboards and Data Analytics.

Voice of the Manufacturer

We are focused on Lean for many reasons, but it boils down to reductions in cost. Not just the cost of manufacturing but the cost of operations. We want Lean to flow through our business and impact everything from order entry to warehouse operations.

Terri Decker
Quality and Reliability
AGA Amana Commercial Products

Source: Aberdeen Group, May 2007

Chapter Two: Benchmarking Requirements for Success

Competitive Assessment

Based on the Maturity Class Framework, Aberdeen established Best-in-Class characteristics in five key categories: (1) process (ability to standardize process across the organization while maintaining the autonomy of local decision makers); (2) organization (establishing internal centers for Lean excellence); (3) knowledge (delivering factory floor data as actionable intelligence); (4) technology (using Lean Software Applications); and (5) performance management (the ability to measure KPIs in real-time).

Table 3: Competitive Framework

	Laggards	Average	Best-in-class
Process	Best practices for Lean scheduling and execution have been standardized across the organization:		
	22%	25%	40%
	Lean scheduling and execution is optimized by local decision makers.		
	30%	35%	46%
Organization	Established center for Lean excellence:		
	18%	18%	34%
Knowledge	Factory floor data is delivered to Lean scheduling decision makers as actionable intelligence:		
	20%	27%	41%
Technology	Lean technology currently in use:		
	Lean Software Applications : 13%	Lean Software Applications : 14%	Lean Software Applications : 31%
	Microsoft Excel based Lean tools: 32%	Microsoft Excel based Lean tools: 45%	Microsoft Excel based Lean tools: 43%
	ERP: 44%	ERP: 53%	ERP: 56%
Performance	Frequency of KPI measurement:		
	<ul style="list-style-type: none"> • On Time Delivery measured in Real Time: 6% • WIP measured in Real Time: 14% • Scrap measured in Real Time: 7% 	<ul style="list-style-type: none"> • On Time Delivery measured in Real Time: 2% • WIP measured in Real Time: 15% • Scrap measured in Real Time: 5% 	<ul style="list-style-type: none"> • On Time Delivery measured in Real Time: 22% • WIP measured in Real Time: 29% • Scrap measured in Real Time: 22%

Fast Facts

The Best-in-Class are:

- Over 50% more likely to standardize Lean scheduling and execution processes across the enterprise.
- Almost twice as likely to establish an internal Lean center for excellence.
- Nearly twice as likely to deliver factory floor data as actionable intelligence to decision makers.
- Over twice as likely to use Lean Software Applications.
- Over twice as likely to measure On Time Delivery, WIP, and Scrap in real-time.

Source: Aberdeen Group, May 2007

Decorate Products Case Study

Decorated Products has been producing printed nameplates on a wide variety of materials for more than 50 years and currently has 42 employees at its 44,000 square foot facility in rural Westfield Massachusetts. The company has over 1,500 active customers and has produced more than 30,000 different products, the large majority of which have been custom-made.

Decorated Products is currently focusing on Lean initiatives to compete with low-cost alternatives in the global market place and uses Lean to ship faster with fewer defects than the competition. Over the past 5 years on the Lean journey Decorated has reduced raw material inventories by 85%, cut document management time by over 50%, and has integrated manufacturing costing data with quality management data to better focus continuous improvement team initiatives. Decorated also collects factory floor data in real time and delivers the data to decision makers as they need it. Moving forward, Decorated plans to continue on the Lean journey by specifically focusing on Lean scheduling. Decorated plans on using the advanced scheduling module of their ERP implementation to extend the benefits already being enjoyed by Lean and move to true pull production.

Organizational Capabilities and Technology Enablers

Best-in-Class manufacturers use a two-tiered business processes strategy. First, Best-in-Class manufacturers standardize Lean scheduling and execution best practices across the organization based on the findings from Continuous Improvement teams. Second, Best-in-Class manufacturers incorporate, within the enterprise-wide standardized best practices, the necessary tools and information for Lean professionals to make optimal Lean scheduling and execution decisions at the local level. While this two-tiered approach is powerful, it is not necessarily intuitive. It requires a world-class organization to standardize best practices across the organization while simultaneously empowering local decision makers. The analysis below will show how this is only one piece of the puzzle for achieving Best-in-Class performance.

When considering the organizational structure of Best-in-Class manufacturers, it is just as interesting to examine how the Best-in-Class do not differentiate from Industry Average and Laggard manufacturers as do. Interestingly, Best-in-Class manufacturers are no more likely to have established executive ownership of Lean initiatives than Industry Average or Laggard firms. In fact, 41%, 43%, and 40% respectively have established executive ownership of Lean initiatives; providing no evidence that such ownership fosters superior performance.

On the other hand, Best-in-Class manufacturers are nearly twice as likely to establish an internal Lean center of excellence. This finding shows that the way in which senior management assumes ownership for Lean initiatives plays a larger role in enabling Best-in-Class performance than whether or not such an ownership exists. Such an institution serves multiple purposes within the

Voice of the Manufacturer

We have developed an organization based on Lean principles. Our Senior Vice President is embracing the initiative and there is full support from the executive team. The local Center for Lean Excellence is managed by a regional director who is monitoring three different plants which each have their own Lean experts dedicated to sharing best practices across the enterprise.

Antonio Santoyo
Manager
Sanmina – SCI Corporation

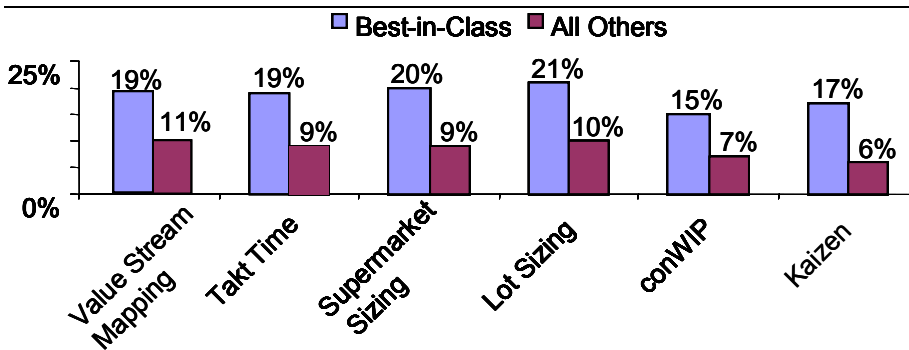
organization. First, it acts as a litmus test for the required level of commitment by senior management, and second, it provides the resources required by Lean professionals to enable Best-in-Class performance. Additionally, Best-in-Class manufacturers use both the organization of the enterprise and current technology capabilities to provide Lean decision-makers with actionable intelligence from factory floor data. The purpose of manufacturing intelligence is to position data in the proper context for decision making. In the case of Lean scheduling and execution, this can be a difficult task to accomplish without automated Lean tools and an integrated approach to technology. In order for data to be actionable, Lean decision makers must know the current state of both scheduling and execution, which includes visibility into both customer demand and the status of WIP.

Voice of the Manufacturer

This year is the time for the big push in the area of Lean tool automation. We've reduced our raw material and WIP significantly, so now it is time to use Lean scheduling to become a true pull system. We're a job shop, so this is a bit different than a lot of manufacturing operations, making electronic scheduling critical to doing it. Manual methods can't possibly find the best "critical paths" on the fly.

Jeff Glaze
President
Decorated Products

Figure 3: Share of Manufacturers Using Automated Lean Tools



Source: Aberdeen Group, May 2007

Finally, Best-in-Class manufacturers are over two times more likely to use Lean Software Applications than Average and Laggard manufacturers. Additionally, Laggard manufacturers are over 33% less likely to use Microsoft Excel based tools to support Lean initiatives than Best-in-Class or Average manufacturers. Closely related to the use of technology is the ability to measure KPIs in real-time, which as one would expect, Best-in-Class manufacturers are considerably more likely to do in real-time than other manufacturers.

Aberdeen Insights – Technology

It turns out that the KPIs which are most likely to be measured by the Best-in-Class are not the same KPIs which the Best-in-Class measure in real-time. When it comes to the real-time measurement of KPIs, Best-in-Class manufacturers are twice as likely as other manufacturers to measure On Time Delivery, WIP, and Scrap in real-time. However, when it comes to which KPIs Best-in-Class manufacturers are most likely to measure, Best-in-Class manufacturers are most likely to measure Throughput, and Manufacturing Cycle Time, along with On Time Delivery.

The main take-away: not all KPIs need to be measured in real-time and often the most prevalent KPIs need not be measured in real-time to achieve Best-in-Class performance.

Chapter Three: Required Actions

Whether a company is trying to move its performance in Lean scheduling and execution from “Industry Laggard” to “Industry Average,” or “Industry Average” to “Best in Class,” the following actions will help spur the necessary performance improvements:

Laggard Steps to Success

- *Focus on reducing overall manufacturing costs when deciding how to implement Lean scheduling and execution principles.*

The world of Lean has grown to incorporate many different tools, functional areas, and paradigms. Do not be distracted, and remember that Best-in-Class manufacturers continue to utilize Lean in response to the market demand to reduce operating costs. The mantra of cost reduction is powerful, helps define the overall scope of Lean initiatives, and does not change whether the specific area of concern is continuous improvement or scheduling and execution.

- *Measure Throughput and Manufacturing Cycle Time at least daily.*

These two KPIs should be measured on a daily basis in the very least and used to benchmark the overall success of Lean scheduling and execution initiatives. Do not focus on achieving real-time visibility for these metrics. Rather, focus on standardizing the measurement of these KPI across the enterprise and benchmarking success on a consistent basis.

- *Establish executive ownership of Lean initiatives.*

Executive ownership does not ensure Best-in-Class status on its own accord but is a necessary step in the journey. By establishing executive ownership, other institutional changes have a much better chance of taking hold, such as the establishment of a Lean center for excellence, enterprise-wide standardized Lean scheduling processes, and integrated technology adoption.

Industry Norm Steps to Success

- *Standardize best practices for Lean scheduling and execution based on Continuous Improvement team findings.*

No organization will use all of the available Lean scheduling and execution tools, nor will any two organizations interpret Lean scheduling and execution principles in exactly the same way. For these reasons, it is essential for manufacturers to apply the knowledge gained through the Continuous Improvement process to coordinate Lean scheduling and execution best practices across the

Fast Facts

To achieve Best in Class status manufacturers must:

- Measure Throughput and Manufacturing Cycle Time at least daily.
- Measure On Time Delivery, WIP, and Scrap in real-time.
- Deliver factory floor data as actionable intelligence to Lean scheduling and execution decision-makers.
- Implement Lean Software Applications.
- Integrate Lean Software Applications with ERP and automate Lean tools.

organization. Under no circumstance should standardized best practices usurp the need for locally optimized decision making, which is also being utilized by Best-in-Class manufacturers and should always be preserved by institutionalized best practices.

- *Deliver factory floor data as actionable intelligence to Lean scheduling and execution decision-makers.*

Optimized local decision making can only be achieved by providing actionable intelligence to decision-makers, where actionable intelligence is defined as relevant and timely data presented in the proper context. This decision-making process provides both demand and WIP data to Lean scheduling and execution decision-makers in the context of Lean principles such as Takt Time, Pace Maker Scheduling, and conWIP.

- *Implement Lean Software Applications.*

Best-in-Class manufacturers are more than twice as likely as other firms to use Lean Software Applications. This should be viewed as a call to action, where underperformers should utilize these applications to automate traditional Lean tools and coordinate execution across the enterprise.

Best in Class Steps to Success

- *Measure On Time Delivery, WIP, and Scrap in real-time.*

Measuring On Time Delivery, Throughput, and Manufacturing Cycle Time is a start but will not sustain Best-in-Class performance. Best-in-Class manufacturers are taking it a step further by measuring On Time Delivery, WIP, and Scrap in real time. With these three KPI measured in real time, an accurate picture of current execution is given, which helps provide the necessary context for making optimal Lean scheduling decisions.

- *Integrate Lean Software Applications with ERP and automate Lean tools.*

Real time visibility into On Time Delivery, WIP, and Scrap only presents half the picture. Best-in-Class manufacturers also rely on demand visibility, which is achieved through enterprise interoperability, to make optimal Lean scheduling and execution decisions. Once these manufactures have established both production and demand visibility, the power of automated Lean tools can be leveraged effectively to enable continuing Best-in-Class performance. Additionally, as only about 20% of Best-in Class manufacturers currently use automated Lean tools, incorporating these tools is an ideal way for many Best-in-Class manufacturers to achieve or sustain a competitive advantage.

Voice of the Manufacturer

Lean enablement is not an exercise or motive, it is in our culture and blood, and that makes the difference. However, it is very critical that the appropriate factory floor data is shared among all decision makers so that all are on the same platform and have real stock of the situation. In traditional Lean terms: it is a benefit because it reduces wasted time in formal meetings and discussions.

Jaideep Khanduja
General Manager –
Quality Assurance
G4S IT Services

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Appendix A: Research Methodology

In May of 2007, Aberdeen Group examined the Lean scheduling and execution initiatives of over 400 manufacturers in both the discrete and process manufacturing industries.

Responding manufacturing executives completed an online survey that included questions designed to determine the following:

- The degree to which Lean scheduling and execution initiatives are deployed across the operation and the performance implications of the technology.
- The structure and effectiveness of existing Lean scheduling and execution implementations
- Current and planned use of Lean Software Applications to aid operational and promotional activities
- The benefits, if any, that have been derived from Lean scheduling and execution initiatives

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

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

Responding enterprises included the following:

- **Job title/function:** The research sample included respondents with the following job titles: CxO or President (5%); Vice-President (6%); Director (12%); Manager (47%), Staff (13%), Consultant (5%), Other (11%).
- **Industry:** The research sample included respondents exclusively from manufacturing industries. Automotive was the largest segment with 25% of the sample. Aerospace and Defense accounted for 20% of respondents, Industrial Equipment Manufacturing (18%), Metals (14%) and Medical Devices (11%). Other sectors responding included Food and Beverage, Pharmaceuticals, and High-Tech among others.
- **Geography:** The majority of respondents (76%) were from North America. Remaining respondents were from the Asia-Pacific region (10%), and Europe (13%).
- **Company size:** About 21% of respondents were from large enterprises (annual revenues above US\$1 billion); 38% were from midsize enterprises (annual revenues between \$50 million and \$1 billion); and 41% 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 Lean Scheduling and Execution Benchmark Report. Their sponsorship has made it possible for Aberdeen Group to make these findings available to readers at no charge.

Table 4: PACE Framework

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

Source: Aberdeen Group, May 2007

Table 5: Maturity Framework

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

Source: Aberdeen Group, May 2007

Table 6: Competitive Framework

Competitive Framework Key
Process — What is the scope of process standardization? What is the efficiency and effectiveness of this process?
Organization — How is your company currently organized to manage and optimize this particular process?
Knowledge — What visibility do you have into key data and intelligence required to manage this process?
Technology — What level of automation have you used to support this process? How is this automation integrated and aligned?
Performance — What do you measure? How frequently? What's your actual performance?

Source: Aberdeen Group, May 2007

Table 7: 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, May 2007

Appendix B: Related Aberdeen Research

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

- [*Manufacturing Flexibility: Synchronizing the Shop Floor and Supply Chain*](#), January 2007
- [*The Lean Supply Chain Benchmark Report*](#), August 2006
- [*Roadmap to Lean Success, Measurement and Control*](#), 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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