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Making it Lean:

The Road to Enterprise Productivity

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Executive Overview

In the 1960's and 1970's, some companies followed Japanese examples to make their factories more efficient, and took up Lean production methodologies. Other companies later discovered Six Sigma standards for improvement of product quality. By joining Lean and Six Sigma to create the Lean Enterprise, companies discovered their true potential for growth. Now, leading companies are moving to the next level of their journey by leveraging information technology to eliminate redundancy, collaboratively manage data throughout their value chains, smooth business processes, and integrate all the elements needed for Lean Six Sigma implementation.

Lean began as a way to identify and remove production waste to gain competitive advantage. But, managers accustomed to thinking Lean noticed that other areas of the enterprise could also benefit from Lean initiatives. They realized that cross-functional information flows were far more complex than they had to be. Too many steps were needed to manage and control processes and, ultimately, the organization as a whole. By applying Lean principles, routine business operations could be simplified, more rational procedures established, and repetition reduced (if not eliminated), thereby accelerating core business processes and responding more quickly to customer needs.

As this was happening, Six Sigma too was evolving. Six Sigma requires that a company respond totally to customer specifications (VOC-Voice of the Customer) and identifies how the specifications relate to its own business processes (CTQ-Critical to Quality). Six Sigma has always been about improving quality by eliminating variation and making processes repeatable. And, as in the case of Lean, managers who had seen how Six Sigma helped control and regulate what happened on the factory floor began extending it beyond the production line and into the value stream—the business activities required to deliver a product or service—to better meet the needs of the customer.

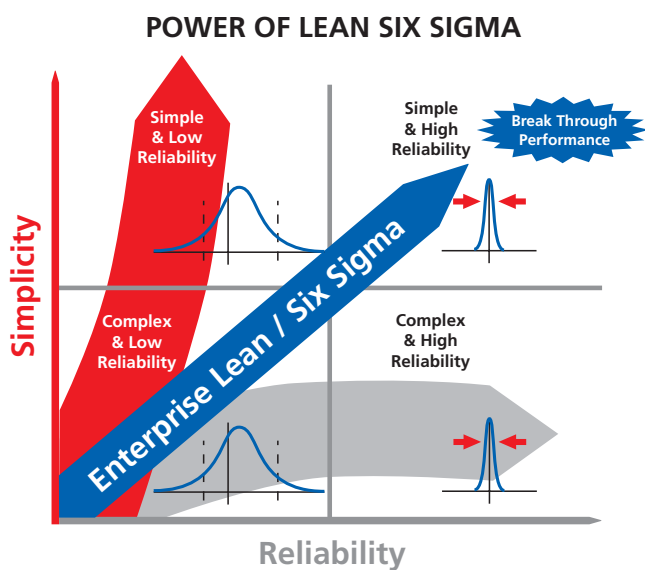
Sometimes the most exciting “new” ideas are simply the synergistic melding of much older concepts, and Lean Six Sigma is a case in point. Lean manufacturing began at Toyota in the 1950's, spread to the company's suppliers, and helped make Toyota one of the world's leading car companies. In 1986 an engineer at Motorola defined a tougher standard for production quality called Six Sigma that allows a maximum of 3.4 defects in a million units, and the Six Sigma standard became the norm. Now many companies are combining the two not-so-new ideas, Lean and Six Sigma, and expanding them into every part of the company, creating an enterprise capable of continuous improvement and breakthrough performance, and enabling them to stay ahead of the competition and meet the challenges of global markets.

Enterprise Lean Six Sigma Means Break-Through Performance

By combining Lean and Six Sigma philosophies to accelerate business processes and deliver value to their stakeholders, companies become Lean enterprises. By training every employee in the principles of Lean Six Sigma, companies create a unique culture focused on enhanced productivity and continuous improvement. The result is the ability to maintain competitive advantage.

Toyota understands this completely and continuously refines its business procedures. New products, efficient channels, better prices, and faster time to market have helped Toyota outrace its competitors. While other car companies have shrunk or suffered continuing losses, Toyota has increased its share of the market to become the second largest car company in the world.

Lean Six Sigma also works for companies considerably smaller than Toyota. Pella Corporation, a major American window and door producer, has followed Lean Six Sigma for more than ten years. Vice President of Manufacturing Denny Van Zanten calls Lean “a part of Pella’s culture.” Chief Information Officer Stephen Printz goes even further: “Here, Lean is a way of life.” That way of life has led Pella to systematically improve its ability to compete by focusing on three goals: simplicity, responsiveness to the customer, and growth. The result over the last 10 years, breakthrough performance: Pella—number two in the market--increased sales by more than 300% while the market leader grew 33%.



Emerson Electric tried out Lean in several manufacturing divisions more than five years ago. After those divisions began showing improved results, the company’s top management saw the light. Chris Stephen, Director of System Planning and E-Business Development, says that success led to creating a new position at the corporate level, a vice president charged with putting together plans for implementing Lean on a wider scale.

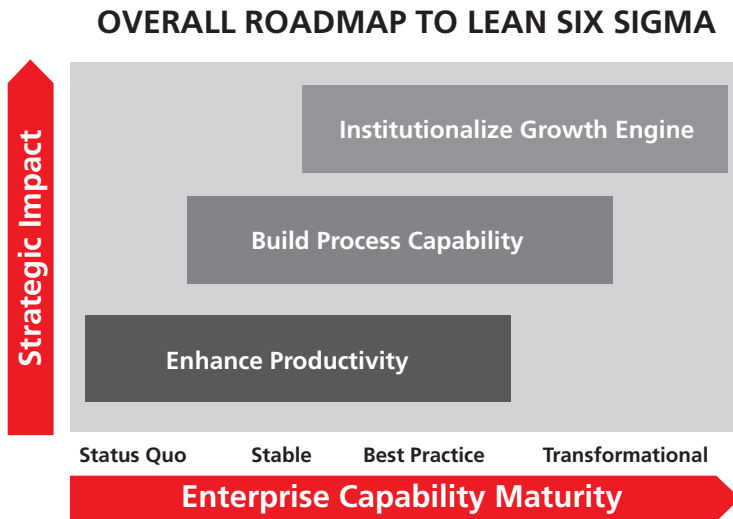
As best-in-class enterprises like Toyota, Pella, and Emerson have realized, Lean and Six Sigma together yield tangible benefits by helping define simple processes and highly reliable outcomes. When internal gains lead to new products, more efficient channels, lower prices, and faster speed to market, such companies recognize they have a growth engine that helps them break away from the competition.

The Journey to Lean Six Sigma: A Roadmap

Moving toward Lean Six Sigma should be thought of as a journey toward perfection. The journey can be described in three stages:

- Enhance productivity: Recognize and eliminate waste of resources, time, and personnel; identify sources of complexity and devise methods to simplify business processes.
- Build process capability: Improve and expand all aspects of the organization to achieve greater consistency and adherence to quality standards and customer requirements.
- Leverage the growth engine: Build infrastructure to encourage and sustain initiative; make investments in performance measurement, business intelligence, and operational objectives to support Lean Six Sigma processes.

Although companies usually start their journey toward Lean Six Sigma by enhancing productivity, the three stages often overlap. Together they make the enterprise more capable of transforming as the industry develops, the market changes, and new business opportunities arise.



Building A Lean Framework

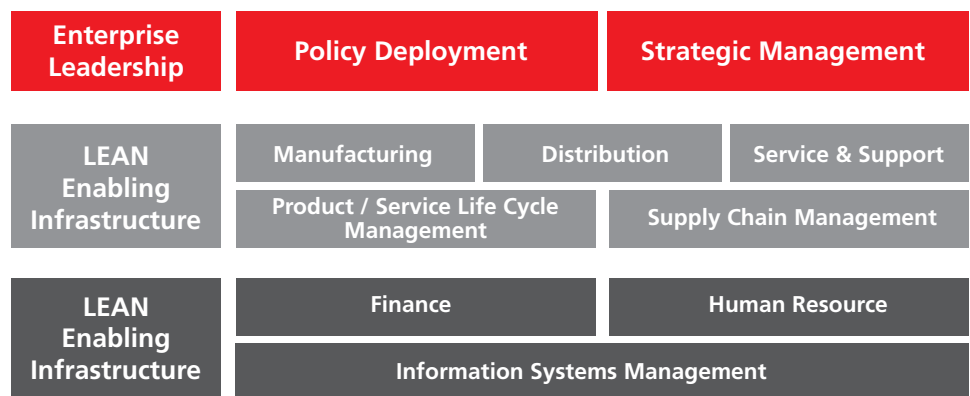
To understand what is happening during the journey, the company must implement a process or system that manages and monitors the Lean Six Sigma initiative. Oracle and Deloitte believe that Lean Six Sigma deployment should begin by developing an enterprise framework or blueprint to define the strategic and operational changes needed to reach specific goals. The framework helps guarantee that the entire company will be involved in the journey. It also provides a long-term focus to offset disappointment about changes happening too slowly. Everyone, managers and employees, will have to remember that while dramatic internal changes may have strategic impact over time, for months or even years, it may seem that nothing is happening.

Steps toward Implementation

Identify value streams: One of the keys to a successful implementation of Lean Six Sigma is defining the scope of the changes desired. Often companies try to implement only in narrow areas. Real success comes from broadly

based changes that transform value streams. These value streams are often cross-functional and may span company boundaries. Initial focus should be on major value streams—the life-cycle processes—including concept to release and order to fulfillment. Supply chain value streams go backward from the final customer, through internal operations, into the supply chain, and down to direct material purchasing.

LEAN FRAMEWORK



Information Systems Critical For Lean Six Sigma

Lean Six Sigma requires informed and trained personnel, effective business processes, and appropriate information systems that can monitor performance, measure outcomes, track metrics, and thereby drive decisions. An inadequate system can detour success while the right system embodies Lean principles and is flexible and scalable to keep up with changing and growing needs of successful Lean implementations.

Lean companies are at various stages of their journey, starting from push-based processes and transform-ing their businesses to demand pull-driven value streams. Moreover, Lean information systems view the entire company as a business process from Lean infrastructure to Lean life cycle processes such as supply chain management and, finally, to enterprise leadership. But Lean implementations will be jeopardized unless information systems meet some universal requirements. Throughout the journey to Lean Six Sigma, information flows must keep up with and complement physical flows.

Ensure a Single Source of Company Truth for Supplier, Customer, BOM/Routing/Quality, Financial, etc.

As a result of outdated legacy systems, executives are often frustrated trying to make decisions when they receive multiple versions of the same data. Guaranteeing that only one version of data exists along the value stream is becoming compulsory in today's competitive global environment. As shown in the example above, accounts payable can be transformed from a complex of decentralized redundant systems to a single shared service, simplifying processes and eliminating wasted duplicate manual efforts.

Make Relevant Data Completely Visible to Key Stakeholders

Lean is a transition from push capability to a hybrid model using the strengths of push planning and the benefits of pull-based execution: plan on push, execute on pull. For example, negotiations with suppliers are simplified by push or long term planning.

On the shop floor, information systems must support production line design and scheduling for mixed-model manufacturing on the same line while enabling fast responses when demand changes. Another key Lean objective is poka yoke or error proofing. For example, information systems must make it impossible to send a duplicate Kanban signal to a supplier.

A division of a US\$10 billion provider of climate control, industrial solutions, and security products is converting to an information technology system that automates sales and monitors technician productiv-ity. The company has also improved its pricing format, decreased administrative costs, and aligned its branches to save on costs of aftermarket parts and sourcing. By standardizing business practices and using technology to trigger alerts and control process flows, the company saved more than \$15 million over the past year and expects to save an additional \$40 million over the next three years.

Pella Corporation had multiple systems that created conflicting islands of information. On the road to standardization, Pella eliminated 45 financial systems and saved \$400,000 each year by getting rid of redundant data entry and unnecessary IT license and support costs. By using technology to support their Lean initiatives, they also retired seven legacy order entry systems that limited visibility and extended lead-time for their customers.

Provide Real Time Data to Drive Management Decisions

As Lean Six Sigma concepts evolve inside a company, increasingly back office processes too are affected. These processes are often more complex than factory floor processes yet have an equal or greater impact on customer satisfaction.

Three years ago a \$3.6 billion holding company involved in annuities, investments, and insurance as well as broadcasting created a five-person team to re-engineer new business operations according to Lean principles. The results have been dramatic. The company reduced application to policy issuance time by 50%, labor costs by 25%, and application errors by 40%. These results contributed to a 60% increase in new life insurance premiums in two years.

Enable Seamless Two-Way Transactions across the Enterprise and Its Value Chain

While visual controls make it relatively simple to operate Lean Six Sigma in a manufacturing environment, some processes require additional technology. Merely sending a Kanban signal to a supplier isn't enough. The information system must also include closed loop feedback for the supplier's return signal acknowledging shipment.

After implementing Lean Six Sigma, a US\$135 billion diversified industrial manufacturing corporation is well along on its journey and has extended Lean Six Sigma practices throughout its supply chain. The company experienced a notable improvement in supplier quality ratings after it started sharing real time information over the Internet. Reaping the benefits, the company has enjoyed double-digit growth for six consecutive years.

Integrate Applications to Eliminate Complexity

Many companies host a variety of legacy information applications that work independently and require separate interfaces to share information. Managing a series of interfaces that don't work together creates hidden waste and drives up IT costs. Individual upgrading of applications adds complexity that can be eliminated when applications are designed for simultaneous upgrading.

A US\$350 million provider of process control instruments for high technology manufacturing exceeds its competitors' lead times by 90%, producing a typical product in four hours versus three days. Technology supported these improvements by making critical demand data available not only internally but also to its suppliers, thereby smoothing demand over the entire value stream.

Invest in Flexible and Scalable Technology and Applications to Reduce Complexity

Everyone knows information is power, but, according to Lean culture, information systems need to provide information access elegantly, without waste. Indeed, legacy information systems can be a burden to a company implementing Lean if they provide unnecessary complication. In Lean language, Capital Linearity means reducing investment capital by matching capacity to demand. Real Application Cluster technology scales computer capacity tightly to demand by using multiple small servers. Investment in servers can be reduced as much as 80%.

A US\$15 billion automotive supplier replaced mainframe computers at 18 of its plants by centralizing computing operations. Enabling a real application cluster technology saved \$500,000 annually while providing an insurance policy against unplanned downtime by having instant fail over capability. The company is now able to scale computing power to demand and minimize unnecessary investment in larger hardware.

Provide Technological Support for Corporate Strategy by Linking Lean Initiatives and Track-ing Results

Successful implementations of Lean are led and managed from the top because it is very difficult to assure that Lean initiatives are aligned with business strategy. In keeping with Six Sigma DMAIC (Define, Measure, Analyze, Improve, Control), companies are turning to policy deployment to manage and control their implementation of Lean. Policy deployment is a technique that approaches measurement and control of Lean initiatives as another process crucial for producing cultural change.

A US\$4.1 billion business unit that manufactures metering valves found that strategy alignment was slowing down the transformation process and costing too much. To solve the problem, they are planning a fact-based application integrated with their transaction processing systems to provide closed loop monitoring and alignment of Lean strategies with resources and results. They expect to save more than US\$8 million per year with this capability.

Summary

Leveraging Lean Six Sigma: Enterprise Growth and Competitive Advantage

Companies achieving outstanding performance improvement are those that have embraced Lean Six Sigma along the entire supplier-manufacturer-customer value chain, and implemented its principles throughout the enterprise. They understand that there is no end to change or progress. A Lean Six Sigma enterprise, flexible and ready to stay ahead of the competition and meet the challenges of global markets, continues its journey, makes improvements, and, sometimes, reinvents itself entirely to keep increasing its lead over today's competitors and prepare itself for the tougher ones yet to come.

For more information please contact:

Doug Gish
Principal, Deloitte Consulting LLP
1010 Grand Ave Ste 400
Kansas City, MO 64106-2232
USA
Phone: 816-802-7270
dgish@deloitte.com

Oracle Corporation
500 Oracle Parkway
Redwood Shores, CA 94065
U.S.A.
Phone 800.633.0936
www.oracle.com/lean

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