

TECHNOLOGY AND THE LEAN ENTERPRISE

BUILDING AN INFRASTRUCTURE THAT DRIVES
THE HIGHEST VALUE TO THE CUSTOMER

White Paper

SAP for Industrial Machinery & Components

THE BEST-RUN BUSINESSES RUN SAP™



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EXECUTIVE SUMMARY

The Link Between Technology and Successful Lean Initiatives

Across the industrial machinery and components industry, successful lean initiatives are increasing as manufacturers recognize the key enabler of continuous improvement and eliminating waste – technology. This SAP white paper presents six brief case studies of manufacturing companies that have done just that. They have each built an underlying technology infrastructure to support a foundation for increasing their value to their customers.

In developing lean strategies, these and other companies intend to compete successfully by differentiating themselves from their competition through customer value. In concentrating on value by eliminating waste and non-value-added activities, these companies are also increasing profit. They identify and eliminate waste through carefully planned lean initiatives and by setting goals for continuous improvement using Six Sigma and other principles of improvement. Underlying these initiatives and goals is a technology foundation built to create and increase customer value.

An enterprise resource planning (ERP) application provides this foundation. When core enterprise software integrates tightly with lean initiatives, the results include improved visibility on inventory and real-time response to customer order changes. Manufacturing links to both upstream vendors and downstream distribution replenishment processes, and business intelligence and analytics capabilities enable proactive, exceptions-based management.

Most significantly, with lean and Six Sigma processes tied to ERP software, performance can be evaluated using consistent measurements for success. These key performance indicator measurements are the metrics that monitor continuously improving operations to deliver the highest value attainable to the customer.

This white paper discusses just how technology connects to the success of lean initiatives that drive value. It defines the lean enterprise and how lean programs impact operations, profitability, and IT.



WHAT DOES LEAN MEAN?

The Object of “Going Lean”

Lean initiatives and Six Sigma combine to enable the lean enterprise. The object of lean initiatives is to drive operational effectiveness and minimize or stop waste by identifying and eliminating any activity that does not add value in the eyes of the customer. On the other side of the same coin, Six Sigma principles seek to refine specific processes to produce a precise level of quality or achieve a result in a statistically stable or repeatable manner. These might include manufacturing, order management, and product design processes. To achieve such predictable results, Six Sigma requires that documented processes be consistently monitored and measured.

When these two cornerstones of the lean enterprise are firmly in place and working together, organizations reduce costs and improve throughput capacity and quality. Companies can deliver products to customers reliably and with shorter lead times. Lean and Six Sigma methodologies can improve profitability by driving operational effectiveness and eliminating variability, defects, and waste that undermine value.

“Leaning Out” the Cash-to-Cash Value Chain

Lean emerged in the industrial machinery and components (IM&C) industry within the factory walls, where early adopters relied on visual and manual tools to focus on process change: material flow, lead times, and manufacturing process throughput. However, enterprises quickly learned they could achieve greater successes when they managed lean improvements through the entire cash-to-cash value chain.

As supply chains have grown longer and more complex, manufacturers have had to meet ever-increasing customer demand for higher quality and variety at lower cost and with always shrinking lead times. In the face of these dynamics, the lean enterprise requires high visibility and close coordination across its global manufacturing network. In today’s fast-changing world of manufacturing, purely visual and manual tools cannot keep up with the pace of change. That requires IT tools designed to support and exploit lean initiatives and Six Sigma principles across the enterprise.

IT Support for the Lean Strategy

A fundamental change to existing structure happens to most organizations that adopt lean practices. That is because going lean requires the identification and breakdown of information silos within the enterprise. Realigning these silos with the overall lean strategy is how to find waste, eliminate it, reduce cost, and improve processes. Technology is here to help by supporting the lean strategy for the enterprise in the following ways:

- **Rolling out common processes.** Establish consistently high, predictable, and repeatable levels of performance enterprise-wide.
- **Extending lean processes beyond the factory.** Leverage the supply chain to deliver value after enterprise performance is improved.
- **Achieving profitable growth.** Optimize the enterprise and supply chain, and then leverage the lean enterprise to increase revenue.

ESTABLISHING COMMON, SUCCESSFUL PROCESSES

Starting Out Slowly

Evolving the lean enterprise is a journey. Most companies begin slowly. They identify key people and train them in lean methodologies and principles. These “lean champions” establish intricate spreadsheets outlining measures to reduce inventory and speed manufacturing processes. They lead the charge and spread the gospel according to lean by holding “kaizen” workshops and soliciting input on ways to improve performance. Kaizen is the process of leveraging the dynamic within a group of individuals who have varying skills and experience for the purpose of executing a process and developing practical improvements that can be immediately implemented. In lean organizations, all employees are encouraged to participate.

Up and Running Lean

Once lean kicks in and processes begin to improve, operations become more efficient, and it has become easier to meet customer expectations, what is the next step? It is not enough to disseminate the successful lean processes only throughout the local organization. World-class companies do it right: they share successful lean practices globally and extend those lean principles to back-office processes to achieve a truly lean enterprise.

Spreading the Lean Word

What happens when a lean champion leaves the company? Who will decipher those intricate spreadsheets that are so often used to run the business? On a global scale, how can companies sustain successful lean practices throughout the global enterprise? Excellent organizations are migrating from people-based approaches to processes supported by a technology that outlives and outperforms the individual.

Establishing the Lean Culture

Implementing an integrated business software platform to institutionalize lean processes creates a paradigm shift: instead of silos of lean expertise, a lean culture is established. It will not be just one person spreading the good word on lean; lean becomes engrained in everyday ways of doing things for everybody. The propagation of continuous improvements across the enterprise builds confidence in lean. In addition, reliable and accurate key performance indicators (KPIs) measure the impact of actions on margins.

These achievements result by establishing common business processes that are continuously evaluated and optimized, as well as by using consolidated enterprise data to perform business-cycle analytics. When this is accomplished, it becomes possible to establish common work processes, enable real-time data sharing, and ensure inventory visibility through application integration and data integrity. It is also possible to provide real-time order management, proactive exception-based management, business intelligence and analytics, and many other capabilities critical to the success of any lean and Six Sigma initiative.



Performance Improvements: What to Expect

It takes a technology foundation designed to support lean initiatives to extend them enterprise-wide. Companies that create such a foundation, as Datasensor SpA and TRUMPF GmbH + Co. KG have done, achieve the following performance improvements:

- Enhance business insight and productivity by delivering real-time, personalized measurements and metrics tied directly to corporate objectives
- Provide access to information, such as business statistics and KPIs, presented in the context of business tasks
- Ensure compliance and predictability of business performance
- Enable deeper financial insight across the enterprise and tighten control of finances
- Automate financial and managerial accounting and financial supply chain management
- Provide rigorous support for financial reporting and corporate-governance mandates, such as the Sarbanes-Oxley Act of 2002

DATASENSOR SpA

Industry: Industrial machinery and components

Revenue: US\$44 million

Employees: 180

Summary:

Datasensor SpA, established on the international market for more than 30 years, is a leading company for research, development, production, and sales of photoelectric sensors and associated devices for industrial automation. The Italian company required an enterprise resource planning solution with integrated financial and supply chain management that would support its lean manufacturing initiative and management-by-objectives approach. Datasensor chose a qualified SAP® Business All-in-One partner solution.

Results with SAP software:

- Saved \$2.1 million in one-off working capital investments over four years
- Progressively reduced costs, saving \$2.2 million in annual expenses
- Increased on-time delivery to 96% or better
- Lowered lead-time to one day for products accounting for 78% of revenue
- Automated purchasing, freeing resources to improve research into new suppliers and negotiation of discounts

TRUMPF GMBH + CO. KG

Industry: Industrial machinery and components

Revenue: US\$2.53 billion

Employees: 7,300

Summary:

To maintain its competitive edge in the manufacturing industry, TRUMPF GmbH + Co. KG, an internationally recognized German manufacturer of industrial sheet metal processing machinery, advanced industrial laser equipment, specialized electronics, and medical equipment, developed a lean manufacturing strategy called "SYNCHRO," supported by the SAP® ERP application and the SAP Manufacturing Integration and Intelligence application.

Results with SAP software:

- Increased production output by 25% to 30% without expanding the production facilities
- Improved availability of materials for end products so they are there exactly when needed
- Lowered replacement costs by 25% to 30%
- Eliminated traditional centralized warehouses while improving material availability and reducing buffer stocks at each manufacturing station
- Accelerated delivery cycle

EXTENDING LEAN PROCESSES BEYOND MANUFACTURING

Leveraging the Supply Chain to Create Customer Value

Once the factory has gone lean by implementing common, successful processes that produce fast and predictable responses, it is time to aim lean initiatives outside the factory walls and into the supply chain. This is where upstream vendors and downstream distribution exist. If lean initiatives target only the factory to improve response times and reduce work in progress, it is likely excess inventory still exists in the distribution process. This situation presents opportunities to leverage the supply chain to increase value for the customer. Top-performing companies like Wilson Tool International Inc. and NIBCO Inc. deliver greater customer value by using technology to accomplish the following process improvements, both inside and outside the factory walls:

- Automate and integrate manufacturing processes with other core business processes to reduce waste and cycle times
- Share common data and information across the company to enable a single version of the truth and to analyze the impact of actions on profit margins

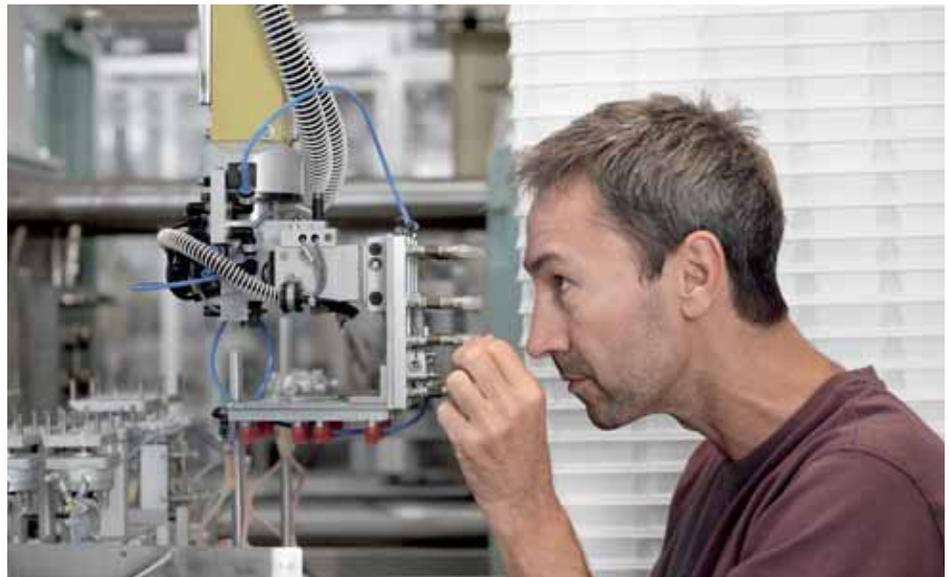
- Dramatically reduce finished goods inventory by extending lean replenishment principles to the distribution network
- Increase demand visibility by establishing point-of-sales communication directly with customers
- Improve days sales outstanding by introducing innovative, vendor-managed inventory programs with customers
- Increase customer satisfaction by significantly improving the responsiveness of the entire value chain

Extending Lean with a Common Technology Platform

Organizations can magnify these benefits by extending lean and Six Sigma practices as a part of a common technology platform. Blending a lean philosophy and new technology makes it possible to design new streamlined

operations quickly, both within and beyond the shop floor, to achieve a high degree of flexibility and customer responsiveness. Extending lean principles throughout the enterprise and the supply chain optimizes the value chain and establishes business-cycle analytics to improve processes continually.

Technology solutions enable world-class organizations to outperform competitors by providing collaborative business processes designed to quickly sense and respond to changes in customer demand. To complement this, specialized software solutions provide the necessary leverage to improve productivity, prepare for new product launches, and drive cultural change throughout the enterprise and up and down the supply chain.



WILSON TOOL INTERNATIONAL INC.

Industry: Industrial machinery and components

Revenue: Private

Employees: 500

Summary:

Wilson Tool International Inc., the world's leading independent manufacturer of tooling systems, focuses on product innovation, reliability, and quality. Based in White Bear Lake, Minnesota, and offering hundreds of highly specialized products, Wilson Tool implemented the SAP® ERP application and a planning component from the SAP for Mill Products solution portfolio to streamline order management and sales management systems. This enabled the company to track inventory and process orders worldwide – automatically.



Results with SAP software:

- Increased productivity by 27.4% and quality by 21.7%
- Reduced inventory by 20% and accelerated inventory turns of spare parts and end equipment, resulting in a return on investment in 18 months
- Reduced lead time by 24.9%, setup time by 53.6%, and travel distance by 57.7%
- Reduced inventory storage space by 43.1% due to improved inventory visibility and control, leading to fewer physical inventory counts and approximately US\$250,000 in productivity-loss savings
- Reduced order errors and returns

NIBCO INC.

Industry: Industrial machinery and components

Revenue: US\$550 million

Employees: 2,900

Summary:

NIBCO Inc., a midsize manufacturer of flow control products in Elkhart, Indiana, competes in mature markets. Its commodity markets have recently undergone significant consolidation. To stay ahead of competition, NIBCO utilized the SAP® Supply Chain Management application to continuously improve supply chain efficiencies and differentiate its products with value-added services.

Results with SAP software:

- Reduced inventory levels from \$102 million to \$76 million
- Improved on-time delivery rate from 60% to 99%
- Reduced baseline procurement costs by approximately \$40 million per year
- Reduced annual distribution costs by 20%

LEAN AND THE BOTTOM LINE: ACHIEVING PROFITABLE GROWTH

Leveraging Agility to Stimulate Continuous Growth

Cost savings is not the main purpose of lean. In addition to finding and removing waste and streamlining operations to increase customer satisfaction, the purpose of lean is to establish a foundation to support profitable growth. Every company embarking on a lean initiative should have a plan for how it will use its freed-up capacity and working capital. Instead of using that capacity to build products that will sit in inventory waiting for an order, world-class companies leverage their agility as a catalyst for growth.

Leveraging Lean Processes to Support New Products and Markets

Many companies exploit newfound capacity by introducing new products and entering new markets with minimal investment in capital equipment and floor space. By leveraging its experience with process improvements, the company can introduce new product lines with efficient, profitable, lean practices right from the start.

Leveraging Lean to Create Value-Added Services

In today's dynamic markets, innovative lean leaders find ways to deliver new, high-margin, value-added services to their customers, such as quick-delivery programs that can command a premium price. To do this, they must have the right technology foundation to keep a step ahead of changing market conditions, competitors, and swings in customer demand. The technology platforms that support adaptability and facilitate rapid deployment of innovative business processes deliver a competitive advantage and drive value for the enterprise in the following ways:

- Simplifies, automates, and integrates complex business processes
- Facilitates and ensures interoperability between applications and systems

- Provides actionable intelligence and supports rapid response to unplanned events
- Supports the complexity of global business
- Increases the productivity of the organization by documenting and enforcing standardized work and procedures across the enterprise
- Supports collaborative processes while providing the highest level of data security for sensitive information



GREENHECK FAN CORPORATION

Industry: Industrial machinery and components

Revenue: US\$500 million

Employees: 2,700

Summary:

Greenheck Fan Corporation of Schofield, Wisconsin, a leading worldwide manufacturer of quality air movement and control equipment, has grown significantly through aggregate product offerings, acquisitions, and international expansion, including the opening of a plant in China. Greenheck selected the SAP for Industrial Machinery & Components solution portfolio because it provided the range of integrated tools the company needed to support its entire business, and because the solutions it selected could scale and adapt to support Greenheck's expanding business processes.

Results with SAP® software:

- Instituted a quick-build program enabling one-day to five-day order turnaround and premium pricing without increasing manufacturing costs
- Reduced lead times from three to six weeks down to one to five days
- Improved factory schedule attainment by 10%
- Increased on-time shipping by 15% with substantially reduced lead times
- Increased productivity with no increase in shop personnel: fulfillment by 15% to 20%, accounts receivables by 17%, accounts payable by 16%, purchasing by 36%, and throughput by 18%
- Reduced space required for manufacturing

LENNOX INTERNATIONAL INC.

Industry: Industrial machinery and components

Revenue: US\$3.4 billion

Employees: 16,000

Summary:

While trying to expand e-commerce capabilities for Worldwide Heating and Cooling – its biggest operating unit – the leaders in heating, ventilation, and cooling systems, Lennox International Inc., hit a roadblock. Business processes locked into silos, combined with a nonscalable technical architecture, limited the Richardson, Texas-based company's existing management information system. Lennox selected the SAP NetWeaver® technology platform to enable e-commerce capabilities across multiple channels and to promote profitable growth.

Results with SAP® software:

- Avoided increasingly costly customer service headcounts while experiencing 13% revenue growth
- Sped up the order fulfillment process
- Enabled real-time pricing and product availability checks
- Streamlined distribution of marketing materials
- Eliminated redundant applications and data silos
- Provided real-time product availability checking, eliminating time-consuming phone calls



WHEN LEAN GOES INTO ACTION, BUSINESS BENEFITS FOLLOW

Using Technology to Lower Costs and Increase Responsiveness and Efficiency

When a manufacturing organization uses technology to establish a foundation for common business processes, it is creating an integrated lean Six Sigma environment that puts sustainable, repeatable performance and profitability within reach. An ERP software foundation provides powerful functionality for manufacturing planning, execution, and quality maintenance, while an open integration platform connects the enterprise to the supply chain to achieve the greatest efficiencies in time and cost. The combination delivers the following rewards to companies pursuing their lean journey:

- **Increased responsiveness.** React quickly to market changes and take advantage of emerging opportunities – without needing to carry excess inventory.
- **Greater efficiency.** Improve order fill rates, increase on-time shipments, and boost manufacturing volumes with shorter lead times – all while increasing the value added per product, per employee, and per resource.
- **Reduced operating costs.** Minimize the costs associated with exception resolution, inventory management, data management, and more – while ensuring the highest levels of quality and customer service.

“We can now go into another wave of improvement opportunities. It all sits in front of us with SAP software in place.”

Don Brekke, Vice President of Information Technology, Greenheck Fan Company



LEARN MORE ABOUT TECHNOLOGY AND THE LEAN ENTERPRISE

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The main guide in any company's lean journey is information. To learn more about how technology can enable an integrated lean environment dedicated to continuous improvement for your company, please visit SAP at www.sapmanufacturing.com. While there, you can further your lean reading with the following articles and documents:

- Adaptive Manufacturing: Enabling the Lean Six Sigma Enterprise
- Strategies for Profitable Growth for Industrial Manufacturers
- Greenheck Business Transformation Study
- Lennox Business Transformation Study
- Nibco Business Transformation Study
- Wilson Tool Business Transformation Study

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