



Five Ways ERP Can Help You Implement Lean

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It's All About Value

Becoming Lean has been a goal of most companies over the last few years. Why is Lean so popular? Lean delivers what companies really need in today's highly competitive world - shorter lead times, improved quality, reduced cost, increased profit, improved productivity and better customer service.

But there are about as many definitions of Lean as there are companies trying to get there. Before we enter into a discussion of how Enterprise Resource Planning (ERP) can help in a Lean initiative, it might be helpful to put Lean in perspective and agree on some basic definitions.

Lean is a western adaptation of what started out as the Toyota Production System. Viewed by many as models of efficiency and productivity, Toyota has achieved remarkable success through a singular focus on adding value. A simple enough concept, indeed, but difficult in practice because it takes a change in perception and focus that at times may seem counterintuitive.

To become Lean, a company must take a hard look at processes and practices to identify those things that truly add value for the customer and eliminate those that do not. The continuous pursuit of waste elimination is the essence of Lean.

Production processes and production activities can be directly addressed in this value vs. non-value campaign. What goes directly into the product, and what doesn't add directly to product value is fairly easy to see. But Lean can and should extend beyond the plant. Indirect activities such as logistics, administration, engineering, and warehousing, as well as other non-manufacturing activities can benefit as much from Lean thinking.

So, eliminating waste and fostering continuous improvement are what Lean is all about. But how does a company embark on a Lean transformation? The first step is to make a firm commitment. Trite as that may sound; Lean projects seldom succeed without a high level of organizational commitment and resolve. Next is to map out processes and identify value and non-value components, with a focus on enhancing the former and eliminating the latter.

Lean is not an overnight quick-fix; it is an unending commitment

Now that we've established what Lean is all about, it may be somewhat difficult to envision how ERP supports Lean. In fact, early thinking on Lean often dismissed ERP and other information systems as inconsequential or even inappropriate in a Lean-focused company. Why?

As Lean thinking has evolved and the concepts broadened, Lean advocates have come to recognize that ERP and Lean work together very well – each supporting and enabling the most important objectives of the other.

Lean purists point to several basic ideas that are the foundation of Lean. The 5 lean principles of value definition and specification, value stream mapping, uninterrupted flow, customer pull and the pursuit of perfection are all supported and enhanced by comprehensive information control and the management tools that an end-to-end enterprise software suite delivers.

Reducing Waste

The nebulous Lean definition of waste – anything that doesn't add value – allows plenty of opportunity for enterprise systems to contribute to the cause. In the most general sense, it is difficult to act on or improve what you don't know or can't see. ERP systems are the central nervous system of the organization. They carry the definitions, the data, a record of the activities of the organization, and provide the measurement systems for determining where opportunities for improvement lie – and for measuring progress of efforts to reduce and eliminate waste. In addition, most ERP systems also provide the ability to model and test alternatives – so-called 'what-if?' scenarios – that help focus efforts on the highest payback activities.

More specifically, processes and procedures are embedded within the ERP system's routings and workflows. This existing "documentation" allows organizations to clearly see what happens today and provides the mechanism for implementing new and more efficient procedures.

The logic within planning and optimization subsystems can help minimize inventory, make the most effective use of transportation and warehousing facilities, properly size and time work activities to avoid waste and minimize non-productive time (set-up, handling), and provide other assistance in avoiding non-value-adding activities.

Enterprise systems are also the "local" link to trading partners that allow for the elimination of waste and delays in the supply chain. Facilities, customers, reps and distributors can help develop better forecast and coordinate activities to ensure better service through collaboration. Likewise, through optimal integration with supplier systems, miscommunication, delays and confusion can be avoided – all of which contribute considerable waste in the supply chain.

Distribution and transportation optimization logic helps make the most of the facilities currently available, and can develop optimized plans for reconfiguring these facilities for more effective and efficient operation. Supply chain planning and management systems can ensure the right inventory is in the right place at the right time – eliminating wasteful excess inventory and avoiding costly shortages. Transportation management systems select the most cost-effective mode and route consistent with inventory and delivery objectives.

Embedded workflow and alert/warning systems speed communications and coordination throughout the organization. These facilities greatly reduce administrative burdens and avoid delays in reacting to changing situations resulting in less waste and better customer service.

Overall, enterprise systems – ERP, Customer Relationship Planning (CRM), Supplier Relationship Management (SRM), Supply Chain Management (SCM) – provide a source of information for mapping out Lean strategies, a mechanism for implementing new and more effective processes, and a measurement system to track progress and document gains.

Continuous Improvement

Lean is not a one-time project, nor is it ever “complete”. It is common practice to set initial goals when first entering a Lean transformation project, but it is essential that achieving those goals is not seen as an end point. There's always more to do – more improvements to attain, more efficiencies to discover, more refinement of processes and procedures to eliminate waste and improve return on Lean investments.

Enterprise systems, as previously mentioned, contain the definition and documentation of processes and procedures – the “as-is” state before any changes. As improvements are made and the changes entered into the system's files, these new definitions serve to enforce and perpetuate the improvements. Comparative measurements document the effect of the changes on lead-times, costs, and efficiency. After the initial objectives are achieved, the system captures the input needed for the next round of improvements; the definitions within the system identify current activities and offer a place to start identifying and eliminating waste.

Most enterprise systems today offer Business Intelligence capabilities as either a standard feature or as an optional add-on. Business Intelligence (BI), also called Business Performance Management or Operations Performance Management, or any number of other variations of that phrase, gathers information from throughout the enterprise (from ERP, CRM, procurement systems, supply chain systems, etc.) into a central analytic workspace. Tools within the BI applications monitor key performance indicators and can automatically alert management to any changes (good or bad) in any of the hundreds of measurement areas. This alerts management to impending problems early – before waste is generated. These warnings can also point to areas needing improvement.

In addition, BI provides powerful interactive analysis tools that can be used to dig deep into data and mine for waste and elimination opportunities.

BI provides graphical views of information, including combinations of data that are not available within individual applications of suites. Oftentimes, this broader view can provide insight into how different parts of the business interact and influence each other. With this new insight, organizations can avoid changes in one area that may negatively affect other parts of the business. All too often, an improvement in one area will trigger additional non-value-adding activities in other departments, leading to higher waste overall.

Sales and Customer Service Opportunities

Customer service has to be a focus of any organization and Lean efforts can and should not only strive to remove waste from customer-facing processes, but also deliver better customer service at the same time. When waste is removed from customer service processes, delays, inconvenience, mistakes, and costs also are eliminated. The resulting streamlined processes inevitably make it easier and more rewarding for the customer to do business with the company.

Most enterprise systems today give as much focus to customer relationship management (CRM) as to internal operations. Some actually go as far as to embed CRM functionality within the ERP solution. CRM capabilities simplify the

order management process by aggregating information from across the business and making it readily available to customers and customer service agents. Integrated pricing, configuration, order validation, availability checking, credit checking, and the smooth the order handling process – delighting the customer and saving time and effort on the part of customer service agents, engineers, warehouse personnel, and accounting personnel.

Workflow management speeds the order through the process, eliminating delays in hand offs to all affected departments. As soon as the order is captured, inventory, accounting, planning, production, and shipping are immediately notified and can start fulfilling customers' requests. All participants' activities are synchronized to work effectively toward fulfilling the customer request. During the life of the order, current and accurate status information is available – online – so the customer can track their order with a few mouse clicks, eliminating administrative burdens for the manufacturer.

Orderless Manufacturing and Kanban

While Lean principles can certainly be applied and are very valuable throughout the organization, most people think of Lean in the context of the plant floor. The most vivid examples (at least to date) come from the factory where work is made to flow smoothly through the plant with absolute minimum delays, handling, inventory, downtime, scrap, and rework. The stereotypical Lean plant uses Flow Production and Kanbans to achieve this result. Flow manufacturing (continuous flow, demand-based flow) is characterized by production lines and/or cells in which work moves piece-by-piece through the process, not in batches. The flow of work is controlled through physical signals called Kanbans that can be tags, labels, containers, or electronic signals.

Traditional batch production is controlled through work orders which, by Lean standards, include a lot of waste. Administration and paperwork are required to define, release, stage, and move orders through the plant; transaction reporting, closeout and considerable supervision and management add even more non-value added activities. In addition, batch production is characterized by down time – typically an individual work piece spends 90% or more of production lead time delayed while other work pieces are being processed -- ie. completion of other jobs, equipment set-up, etc.

Kanban-based flow manufacturing is conducted without work orders – and without the waste associated with work orders. Flow manufacturing is also much faster than traditional processes, more flexible and responsive to changes, ties up less inventory, and delivers higher quality at less cost.

Simple flow manufacturing does not require enterprise software – Kanban tags replace work orders. But this works best only when production is steady, with a limited number of products and few changes. To meet the challenges of a more turbulent (and more typical) work environment, an enterprise system can support flow/Kanban production by issuing electronic Kanbans to match demand and optimize the use of resources while meeting schedules, bringing the benefits of flow/Kanban to a much wider array of manufacturing situations.

Special routines in the automated production planning process, in a system-supported, orderless, demand-based flow manufacturing situation, adapt the usual planning process to smooth work flow and keep production lines and cells evenly loaded and operating at peak efficiency. This is especially important where demand and product mix fluctuates, and/or there is a mix of long-running contracts and smaller short-notice orders. These planning tools extend to proper

sizing and timing of material deliveries with electronic release signals to vendors for timely delivery of needed supplies and parts.

Collaboration

Lean principles can and should be applied to activities that reach beyond the walls of the plant and office.

On the demand side, the better the forecast, the better you are able to plan and produce what customers want, when they want it, with minimal inventory and expediting. The key to a better forecast is to mine the information and knowledge that resides with sales people, distributors, agents, representatives and, yes, with customers. Electronic collaboration tools that are built into sales and operations planning (S&OP) and advanced planning applications make it easy for trading partners to contribute to forecast accuracy and ensure better service and delivery performance from suppliers. After the system completes the basic forecast from statistical calculations, participating partners can make adjustments and suggestions that reflect what they know about future demand, industry trends, demographics, upcoming sales activities and competitive actions. The resulting forecast can then be measured against actual sales to refine the process in the future.

On the supply side, vendors benefit from tighter ties to suppliers. It starts with electronic communication of purchase orders, changes, releases, and payments which is faster, more detailed, and not subject to human errors from manual entry, messy or illegible faxes, or lost paperwork. Vendors respond with electronic acknowledgements, shipment notification, electronic invoicing, and coordination on availability. Beyond the basic transaction-level coordination, collaboration with suppliers can include full participation on design – to better utilize the talent, materials and capabilities of the supplier in developing and producing better products at lower costs.

The World is Getting Leaner

Today electronic tools, as included in the leading enterprise software systems, have made Lean techniques practical and valuable in all kinds of manufacturing and beyond to distribution, retail, service industries, and general business. While Lean ideals are based on simple manual techniques and procedures, enterprise systems are an important mechanism for extending the basic procedures into complex situations, demanding environments, and the wider world of constant changing requirements and needs.

At first glance it may seem that information systems are not part of the picture when you look at the 10 technical elements of Lean: five S's, visual control, standard work, setup reduction, cellular production, mistake proofing (poka-yoke), takt time, continuous flow, level production, and pull system. Granted, these are easily defined with manual processes and physical elements such as tags, fixtures and process sheets, but they are also well supported by the facilities within ERP, CRM, SRM and planning systems. In fact, systems are essential in getting the most out of Lean principles in any situation beyond steady, repetitive production with limited variability and demand changes.

Likewise, the cultural and managerial elements of Lean are well supported by the functions and facilities within enterprise information systems: employee involvement, quality at the source, team responsibility, flexible workforce,

employment stability, system and process thinking, procedural discipline, open communications, continuous improvement, and continuous learning. Above all else, enterprise systems are communication vehicles, making information available throughout the enterprise and coordinating activities to avoid wasteful overlap, omissions, and miscommunications.

Especially outside of the factory floor, systems enable Lean principles to be applied to administrative, maintenance, service, engineering, distribution, and other departments and businesses.

Lean can transform yesterday's business practices into tomorrow's industry leadership. Good enterprise system support is an essential component of virtually any Lean initiative.

About the Author

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Author of the books *Computers in Manufacturing*, *MRP+*, *Why Systems Fail*, among others, Dave is an independent consultant and freelance writer serving both the developers and the users of software and systems for manufacturers. He has extensive first-hand knowledge of manufacturing functions and management practices, enterprise systems and vendor manufacturing software offerings. With over twenty-five years of industry analysis, consulting, teaching, writing, engineering, project management, technical analysis and management experience, he has exceptional analytical and communication skills as demonstrated by his published books, articles, papers and speeches.

Dave has been an independent consultant for the majority of that time, helping users of manufacturing systems to select, implement, and get better results from their systems. In addition, he has performed analyses, written white papers and case studies. He also wrote a number of reports for major analyst firms during this time. Dave is especially attuned to the needs and challenges of the mid-sized manufacturer.

In 1996, Dave and a partner launched *Midrange ERP* magazine, later renamed *Midrange Enterprise*, to act as an information and education resource for this community. The magazine, along with the offshoots *APS* magazine and *FLOW Manufacturing* report were purchased by Penton Media in 1999, where Dave continued to serve as editor-in-chief.

Dave is a certified Manufacturing Engineer, is certified by APICS at the fellow level in Production and Inventory Management and in Integrated Resource Management, and is a Senior Member of SME/CASA. Dave holds a B.S. degree in applied physical sciences from Rochester Institute of Technology.

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For 20 years, Epicor has been a recognized leader dedicated to providing integrated enterprise resource planning (ERP), customer relationship management (CRM) and supply chain management (SCM) software solutions to midmarket companies around the world. With the acquisition of Scala, Epicor is a global leader in the midmarket serving over 20,000 customers in over 140 countries. Epicor leverages innovative technologies like Web services in developing end-to-end, industry-specific solutions for manufacturing, distribution, enterprise service automation, and hospitality that enable companies to immediately drive efficiency throughout business operations and build competitive advantage. With the scalability and flexibility to support long-term growth, Epicor's solutions are complemented by a full range of services, providing a single point of accountability to promote rapid return on investment and low total cost of ownership. Epicor's worldwide headquarters are located in Irvine, California with offices and affiliates around the world. For more information, visit the company's Web site at www.epicor.com.

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