WHITE PAPER

A Roadmap to Lean Manufacturing Success

Software Requirements for Reaping the Rewards of Lean

Contents

Executive Summary

For years, manufacturers have created products in anticipation of having a market for them. Manufacturing operations have been driven by sales forecasts and maximizing production efficiency at each level of the operation. Firms had to buffer inventories in order to be ready for fluctuations in demand.

By contrast, lean manufacturing is based on the concept that production can, and should, be driven by real customer demand. Instead of producing what you hope to sell, or as much as you can make, lean manufacturing produces what your customer wants with much shorter lead times. Instead of pushing product through the factory and on to the market, it's pulled through a system set up to respond quickly to actual customer demand.

Lean organizations are capable of producing high-quality products economically, in lower volumes, and bringing them to market faster than mass producers. A lean organization can make twice as much product with twice the quality, at half the cost, with half the labor and space, and with a fraction of the normal work-in-process inventory. Lean management is about operating the most efficient and effective organization possible, with the least cost and zero waste, while meeting customer demand.

Successful lean manufacturers know that "lean" is a corporate vision that touches everyone from design to product management to marketing, and beyond the four walls to engage external suppliers and trading partners. Lean techniques are more easily applied to some manufacturing styles than others. In particular, lean has been more successful in high-volume, low-mix operations. However, new software tools are now delivering the benefits of lean to high-mix, low-volume operations as well.

With the right methodologies and supporting tools, lean organizations can access the live, up-to-date data that their decision-makers need to achieve corporate goals, including minimizing inventory and waste, shortening lead times, and producing to demand. By using software to eliminate the information gaps that limit flexibility, they can unleash the real potential of their lean enterprise.

Where It All Began: The Origin of Lean

Over a century ago the world witnessed a revolution as mass production replaced the craft production that had been prevalent for so long. Since then, different ideas and practices of mass production have proliferated throughout the manufacturing industry.

Henry Ford, manufacturing's original "lean" thinker, is credited with leading the push toward mass production using his moving assembly line for the Model T car—this was an approach that led to both lower costs and higher productivity.

Ford's continuous flow method worked well in the production of a single, repetitive item; however, the general population gradually began to demand product variation—something that Ford's system was incapable of delivering.

To meet growing demands for greater product efficiency, companies began to departmentalize functions. For example, they would group welders together in one area, painters in another, and harness assemblies in yet another. This allowed each department to specialize in its particular function. Unfortunately, it also segregated each department into "silos." Each department was interested purely in its own efficiency, often with a negative impact on other departments and overall corporate performance.

To support this new system and economies of scale, companies began using increasingly more expensive capital equipment, which led to longer setup times and ever-increasing batch sizes. Larger batch sizes demanded larger machines that could produce at increasingly higher volumes. And so the cycle continued, resulting in production characterized by large batch sizes and long queues between operations. This method of ordering and producing resulted in large inventories of work in process (WIP), raw material (RM), and finished goods (FG).

While North American production was moving toward increasingly larger machines processing larger batches of product, Japanese producer Toyota was developing a completely different manufacturing paradigm. The Toyota Production System (TPS) was based on smaller batch sizes and just-in-time delivery (e.g. producing only necessary units in necessary quantities at precisely the right time). This resulted in reducing inventory, increasing productivity and significantly reducing costs.

In the 1990s the world began to take notice of this highly efficient production system and the term, "lean manufacturing" was born.

Why Go Lean

What does lean manufacturing mean and why should companies pursue it?

Lean manufacturing involves identifying and eliminating non-value-adding activities in design, production, supply chain management, and order processing by developing a Future State Implementation Plan. The idea of lean is founded on the following principles:

- Specify value in the eyes of the customer
- Identify the value stream and eliminate waste
- Make value flow at the pull of the customer
- Involve and empower employees
- Continuously improve in pursuit of perfection

A Lean Primer

The following terms are often used when describing lean manufacturing processes:

Lead Time: The time required for one component to move all the way through the entire process or value stream, from start to finish. Envision timing a marked item as it moves from beginning to end.

Processing Time: The time a product is actually being worked on in a machine or work area.

Pull System: An alternative to scheduling individual processes, where a consuming process withdraws the items it needs from the previous process or a supermarket, and the supplying process produces to replenish what was withdrawn. Used to avoid push.

Push System: Refers to production schedules that determine the start of production batches of products or services, and then follow the consequences through the production process. Because the start of subsequent activities is determined by the preceding activity, it is "pushing" the product through the system.

Supermarket: A controlled inventory of irregularly used items. The supermarket is used when usage is sporadic, making point-of-use storage and Kanban replenishment impractical.

Value: A product or service's capability provided to a customer at the right time, at an appropriate price, as defined in each case by the customer.

Value-Added Time: Time for those work elements that transform the product in a way the customer is willing to pay for.

Value Stream: All the activities, both value-added and non-value-added, required for a product to go from raw material into the hands of the customer, a customer requirement from order to delivery, and a design from concept to launch. Value stream improvement usually begins at the door-to door level within a facility, and then expands outward to eventually encompass the full value stream.

Value Stream Mapping: A pencil-and paper tool used in two stages:

1) Follow a product's production path from beginning to end and draw a visual representation of every process in the material and information flows.
2) Then draw a future state map of how value should flow. The more important map is the future state map.

Waste: Any activity that consumes resources but creates no value for the customer.

WIP: Stands for "work in process." Any inventory between raw material and finished goods.

Wait to Work Ratio: The ratio of the time when value is not being added to a product (wait time, which includes queue times, move times, storage time, etc.) to the time when value is being added.

Failing to consider and apply these lean principles will result in less than optimal results. Applying the tools without an end-to-end plan will lead to point improvements that impact only parts of the process. The resulting improvements can cause problems upstream or downstream and lead companies to make wrong decisions.

Consider the example of a rower who finds a way to row faster than everyone else in the same boat. What would be the impact? Do the actions of this one individual help the boat to travel more smoothly, or reach the finish line faster? Clearly, the answer is no. One rower increasing his or her speed won't improve the team's overall performance and, in fact, would probably have an adverse effect by throwing off the crew's synchronization.

The rower example is analogous to the manufacturing process. When one part of the process finds a way to work at a faster rate than other parts, the question you must ask is whether the extra speed is required, and if it will add value. As in the case of the rower, speeding up in one area to produce more inventory than can be used by the next processing step is not beneficial to the company or the customer—especially if demand is already being satisfied.

Applying the Lean Philosophy

Applying the philosophy of lean requires a fundamental shift in the way you think about business processes. Lean philosophy is all about eliminating waste. Any action or process that does not add value in the eyes of the customer is waste and should be prevented or eliminated. For example, lean means you should:

- View the activities in your processes from the perspective of your customer. Which activities in the process add value for the customer?
- Think from the perspective of the part, product, or service as it goes through the process. Walk the path that a part travels. Look for ways to reduce the distance traveled and reduce the number of times the part is handled.
- View the process as end-to-end, not just as individual steps. Don't optimize individual areas while sub optimizing the whole.
- Look for ways to standardize processes across products.

When your operations are lean, each remaining activity adds value from the customer's perspective. Activities that don't add value represent waste. Table 1 (on the next page) lists the types of waste commonly found in manufacturing. Each type of waste adds cost and delay to the product or service but doesn't add value for the customer. To stay ahead in today's highly competitive global economy, waste in the enterprise must be identified and eliminated.

Some argue that overproduction is the worst form of waste because it leads to many other types of waste. With overproduction there is a greater risk of damage to your product and also the requirement for additional investment in space, raw material, and people. Frequent product or engineering changes can also lead to rework or scrap. And for industries with volatile demand and frequent new product introductions, overproduction leads to obsolete inventory.

Table 1: Types of Waste

Overproduction: Supplying the customer process with more than is needed, sooner than it is needed or faster than it is needed, causes almost all other types of waste.

Inventory: Raw materials, work in process, finished goods.

Waiting: Watching machines run or cycle, waiting for parts, tools, instructions, information, approvals or decisions, waiting for the next operation.

Conveyance: Double or triple handling, moving in and out of staging areas, storage areas and warehouses, ill-planned layouts, long distances, poor housekeeping.

Motion: Walking without working, searching for tools, materials or information, reaching, regrasping, bending, excess motion due to poor housekeeping, moving work from one fixture or position to another.

Unnecessary Processing and Setup: Repair or rework steps, extra setup steps, over specification of the process engineers, converting information in one form to another. This is especially wasteful when done manually and when measuring the wrong things. Examples of waste include manual processes to convert planning system output to a schedule that can be used by the lean factory.

Defects: Defective or scrap materials, out-of-statistical control processes, low yield, incorrect schedules, engineering documents, information.

People's Skills: Treating employees only as a source of labor and not recognizing them as true process experts.

Resources: Wasting space and energy

A Roadmap to Lean Manufacturing Success

The journey to successfully implementing a lean program requires you to take the following steps:

1. Determine the value of your product or service from your customer's point of view. This is not limited only to the features they want, but also includes what they would knowingly be willing to pay for. Once you have this information, you have a roadmap for creating a lean enterprise.
2. Map out the end-to-end process that takes your product from raw material to the customer. This includes value-adding steps and non-value-adding steps.
3. Review your map and look for areas where you can flow work from one processing step to the next, without the need for any inventory between. This is also referred to as single piece flow.
4. If you can't flow from one process to the next, then you need to set up a pull system. We refer to these areas as supermarkets. Supermarkets, which hold the inventory, must be kept to a minimum quantity until the workflow problem is resolved. Typically you will set minimum and maximum inventory values and use a Kanban system to control the flow of material.
5. Review your map to eliminate any process that does not add customer-perceived value. If a process does not add value for your customer, why are you wasting resources doing it?
6. Relentlessly and continuously eliminate waste, including overproduction, wherever you can find it.

The preceding six steps can reduce inventory as well as lead time. Other potential benefits of lean include:

- Reduced labor costs
- Reduced storage costs
- Higher quality goods
- Improved cash flow

Realizing these benefits requires using the appropriate tools, at the appropriate time. The most important tool is value stream mapping.

The Value Stream Map

The value stream map is a pictorial representation of the activities required to produce a product or service from raw material to the customer. What differentiates a value stream map from other mapping processes such as process mapping and flow charts? A value stream map differs in that it:

- Includes the amount of inventory that exists between activities
- Includes the information flows for the product as it travels from end to end
- Provides a timeline showing the processing time and total lead time

The Value Stream Map: An Example

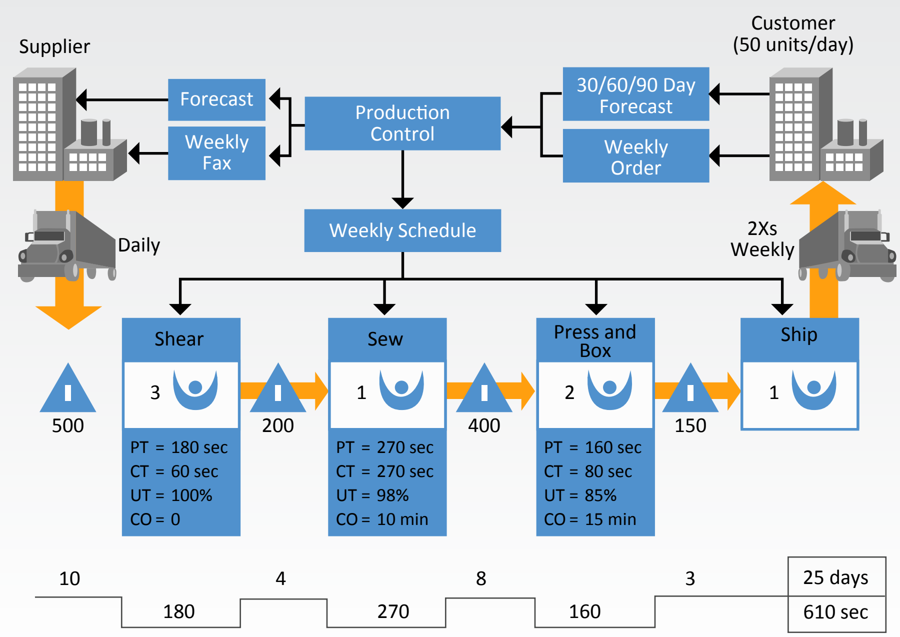
This value map represents the steps a part would take as it traveled from raw material to customer. At each processing step, key information was recorded.

The top portion of the map shows the information flow. The middle section shows the actual steps required to make the part. The timeline at the bottom indicates how long it would take for a single part to go from raw material stage to finished goods.

The example shows that there are 610 seconds of actual processing work on the component, but that it takes a total of 25 days for the component to travel through the entire process.

Is this unusual? Not really. In most enterprises the processing time rarely makes up more than 5 percent of the total lead time.

Figure 1: Example of a Current State Value Stream Map



PT = Process Time, CT = Cycle Time, UT = Up Time, CO = Changeover Time

Taking a Closer Look at the Value Stream Map

The value stream map can be further explained by examining a specific step, "Sew. " Information for the Sew step is obtained by asking employees working in that area questions such as:

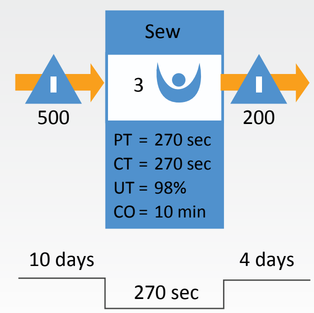
- Where did you get your build information from, and in what form? (In this case the information comes from production control in a weekly build schedule.)
- Is there a lot size imposed by the process?
- How long does it take to process that minimum quantity (or actual processing time)?
- Is the process available all the time? If not, how often is it unavailable?
- How long does it take you to change production from one part to another?

The diagram contains a data box with the following information:

- Processing time (PT = 270 seconds)
- Cycle time (CT = 270 seconds)
- Uptime (UT = 98 percent)
- Changeover time (CO = 10 minutes)

In order to complete the data for the "Sew" step, we would look at how much inventory is waiting to be processed, and how many finished units are ready for the next step.

Figure 2: The "Sew" Processing Step



We show the quantity waiting to be processed under an inventory triangle before the processing step. We show the amount already finished processing under an inventory triangle after the step.

We then transfer the processing time to the timeline and calculate how much time it would take to use up the inventory before, and after, the processing step.

To perform this calculation we use the customer demand rate and divide it into the amount of product in inventory. In this case the customer demand rate is 50 items per day. We repeat this mapping activity for all the processing steps required to complete the product.

How many times have you asked how long a job will take? When you are told there are only a few minutes of work left to complete the job you're pleased. Then you find out that no one can get to your job for days or sometimes weeks. It's not the processing time that becomes the issue but rather the inventory ahead of you. Time and money are often spent trying to reduce the few minutes of processing (10 minutes in the diagram), while little, or no effort is spent trying to reduce the many days of waiting (25 days in this case).

Traditional manufacturing improvement processes focus on the production activities (processing time). Measurement systems separate material control from processing of the material and different departments are responsible for each activity. What happens at the work centers and what happens between the work centers are weakly tied together. Engineers focus on reducing the processing time to make a product. Elsewhere in the company, departments focus on counting and storing the inventory rather than eliminating it to reduce the product's lead time. The question that companies must ask is, "How long does work sit idle in the plant without any value being added?" This presents a compelling argument for the next step, namely the future state map.

The Future State Map

After the value stream map is drawn, it's time to create a future state map. The future state represents your value stream after eliminating the waste in your current state. This requires that you first identify the root cause of waste and then eliminate it. If you can identify the problems that prevent you from reaching your future state you can then apply the appropriate lean technique or tool to remove those problems. For example, simply removing excess inventory won't solve your problem. It will reappear almost immediately. So you need to change your process.

Identifying why the inventory exists in the first place, then designing a process to eliminate that cause, will result in a sustainable improvement. Some of the more frequently used tools that can help you work toward a future state are described in Table 2. The tools must be used in conjunction with your value stream maps. The resulting future state implementation plan identifies what to do, when to do it, and who is responsible for completing the task. All tasks are part of finalizing the future state within the next six to 12 months.

The implementation plan gives the entire organization a direction and common goal and keeps everyone focused on the customer and not their individual departmental benefits.

Table 2: Examples of Tools to Help You Achieve Your Future State

Challenge	Tool	What the tool does
Poor machine performance causing high amounts of downtime.	Total productive maintenance/preventative maintenance (TPM)	An ongoing, continuous improvement initiative to improve equipment performance.
Areas are disorganized, tools and equipment are difficult to find, time is spent locating tools and materials, then moving them to the point of use.	5S	An ongoing exercise in organizing and cleaning up work areas. The 5Ss represent the starting letter of the Japanese words for the steps in the process. Simplify (set in order), Sweep (shine, cleanliness), Sort, Standardize, and Sustain (self-discipline).
Poor quality, inconsistent results.	Visual Controls	Physical indicators that inform employees where things go, which tools to use, what is expected, or what is happening. For example, markings on floors or walls indicating where tools or equipment should be placed in the work centers, or color-coding to match fixture locations with the appropriate tool. This can also include signs or information boards.
Scheduling work or areas where you can't flow product.	Poka-yoke	Mistake-proofing. Designing systems (often visual, common sense) so that processes can only be done the "right way."
	Six Sigma	Formal programs to improve the quality and consistency of processes.
	Kanban	A signaling device that gives instructions for production or conveyance of items in a pull system. This can be a physical signal (e.g. a card) or an electronic signal on a computer screen.
Long setup times.	SMED: (Single Minute Exchange of Dies)	Concept that says most setups can be completed in less than a minute; all setups can and should take less than 10 minutes.
Reacting effectively to changes in demand, product mix, bills of material, production processes. Tying ERP transactions to lean execution.	Lean Planning	Translates changes in demand or structure into changed requirements throughout the supply chain. Helps reorganize Kanban sizes and work space organization in light of changes.

Software and Lean

The focus of lean manufacturing is execution—the actual transformation of materials into a product that is valued by customers. The most successful manufacturers are implementing Lean Six Sigma initiatives—adding lean thinking to Six Sigma strategies—as they recognize that time efficiency and responsiveness are also significant value-adds.

Lean thinking is also spreading into other areas of the enterprise. Order taking, product lifecycle management, production planning, payment, and other business processes are also candidates for redesign using the lean methodology.

Companies can dramatically reduce non-value-added administrative processes to achieve benefits similar to those achieved from the shop floor. At one level, all administrative processes could be considered as waste since they don't add value for which the customer is willing to pay. On the other hand, a minimal level of administrative operations is required, if only to know what the customer has ordered and to ensure that the right product is delivered to the customer.

Analogous to manufacturing, there are some common sources of waste in administrative operations:

- Capturing information that is not needed to add value elsewhere in the process.
- Capturing (entering) the same information more than once.
- More than one person or system processing the same information.
- Information waiting to be acted on.

The secret of lean administration is the smooth flow of information. While lean manufacturing focuses on pulling product through production in a smooth flow, lean administration focuses on facilitating the flow of cash and product by flowing information to production and supply chain processes (e.g. planning). As soon as the product achieves any level of complexity, software is the only practical approach to managing this information flow.

Users want access to current information when they need it (e.g. pull) rather than the result of scheduled batch runs (e.g. push). They also need to see projections and analysis based on current, real-time information and potential "what-if" scenarios. This is truly on-demand production planning.

Lean Software

Lean software satisfies two requirements:

- Ensures the right product and quantity is delivered to the right customer at the right time.
- Facilitates the flow of that product to the customer.

There are four primary functions in lean planning:

- Providing the tools to design and manage the production resources (e.g. design for flow).
- Determining the date when customer orders can be satisfied (e.g. order promising).
- Communicating requirements (e.g. part, date, quantity) throughout the value chain.
- Ensuring orders can only be started once all the components are available (Clear-to- Build). This also links ERP transactions with lean execution.

Design for Flow

Planning is an important aspect of the 5S and Kanban tools mentioned in the previous section. Setting up production processes using 5S and Kanban requires extensive design activity. Many questions must be answered.

Examples include:

- Which materials are used most frequently on a particular product line? This is helpful for organizing component locations within work areas.
- What is the ideal Kanban bin quantity (or number of fixed-size bins) required for the projected production use of a component at a work area?

On a regular basis, as demand quantities and mix change, the answers to these questions change and work area organization needs to be changed accordingly.

Software is needed to help with initial design of work areas and to help reorganize the lines to reflect changed demand patterns.

Order Promising

Order promising—validating an order promise or due date to material and capacity availability —becomes key to on-time delivery in environments with significant product mix. Rough cut capacity planning and constraint planning are important elements here as well. An overloaded production plan (master schedule) is a recipe for disaster. No amount of tuning will provide unavailable components or radically increase capacity to meet unrealistic delivery goals. Once the production plan is validated, lean execution systems can, and will, deliver product on time to a feasible production plan.

There is a requirement for software that can rapidly determine promise dates as orders are being created so that the production plan remains viable. In some cases, delivery can be promised against planned production (this is traditionally available-to-promise operation against a planned master schedule). However, particularly with configured products, there may be insufficient production planned for a particular configuration, and order promising must consider materials and capacity through several levels of production or assembly processes.

Ideally, besides rough cut capacity planning, the software should be able to determine promise dates for alternative configurations, dates, and/or quantities so the customer can select which combination of delivery date, product, cost, and quantity best meets their needs.

Communicating Requirements

To make lean work, information must be available when users need it. Many manufacturers that attempt to implement lean practices discover that their ERP/MRP system actually makes it more difficult to get lean. The long batch processing times associated with these systems means it can take days to assess different courses of action, to get the data required to make production decisions, and to communicate changes throughout the value chain.

In environments where requirements fluctuate, particularly where there are changes due to new orders, last-minute configuration changes, or frequent engineering changes that impact material requirements, the changed requirements must be communicated throughout the value chain. Given that it takes time for the

Lean manufacturing depends on visibility and flow, not inventory. Kinaxis provides tools that help facilitate flow by replacing inventory with information.

value chain to react to changed requirements, every hour (or day) that it takes to communicate a change to the lowest level supplier translates into an hour (or day) delay in satisfying the customer. Supply chains buffer against potential changes by carrying extra inventory to cover each hour (or day) of uncertainty. Therefore, in a lean supply chain, every hour saved in communicating changed requirements translates into one hour less buffer inventory.

There is a requirement for software to calculate revised requirements at all levels of the value chain immediately following any change, and to communicate resulting changes throughout the value chain so that it can immediately adjust to supplying the correct components. Advanced supply chains need to communicate potential changes to determine the supply chain's ability to react before selecting among alternative options.

Clear-to-Build

Lean-inspired pull-based systems work well for repetitive production because they can rely on the availability of necessary components. However, pull systems are not well suited to high mix, low-volume operations because unique components are used infrequently. These components need to be managed based on the actual customer orders, not on some average usage figure. The problem is exacerbated when unique components are themselves subassemblies.

Pull triggers in lean manufacturing assume that production to satisfy a demand can be completed within a fixed time of the trigger event. That is, they assume that all necessary component materials are available and that production can be started as soon as the process has an available slot. Clearly, production will grind to a halt if any materials are not available. For simple products (e.g. short bill of material), operators can visually check that necessary materials are available. However, for complex structures, a visual check is not possible, or can only be done after physically allocating (pulling) all the components for an order. This type of supply allocation process is often counter to a smooth flow (production line) and risks potential production because materials are allocated to one order that is blocked by other components when those allocated components could be used to complete other orders.

There is a requirement for software to test for component availability before orders are released for production. Ideally, the component test should reserve components based on order priority and due date so the most important orders can be satisfied in preference to lower priority orders.

Kinaxis and Lean

Lean manufacturing depends on visibility and flow, not inventory. Kinaxis provides tools that help facilitate flow by replacing inventory with information. Kinaxis provides a flexible and powerful platform for lean manufacturing that allows all participants in the supply chain to access information and to simulate the effect of potential changes.

Kinaxis RapidResponse software also eliminates the time wasted waiting for answers

"Long batch processing times associated with traditional systems (e.g. ERP/MRP) means it can take days to assess different courses of action and to communicate changes throughout the value chain. In contrast, RapidResponse's advanced technology gives users the power to easily compare multiple possible decisions against key business performance metrics to facilitate faster, better decision-making. This reduces the time it takes to respond to actual or potential change."

Duncan Klett,
Founder and Vice President,
Analytics Research, Kinaxis

from ERP systems, enabling users to respond very quickly to actual or potential change. The on-demand RapidResponse solution combines easy browser-based access with memory-resident data and analytics to support collaboration, "what-if" simulations, and real-time decision-making. Through powerful scenario-building capabilities RapidResponse can identify opportunities for continuous improvement with respect to lead time reduction, enabling faster, better decision-making for maximum gains.

RapidResponse's single data model consolidates information, eliminating the need for re-entering and cross-referencing data from different systems. Web-based interaction greatly reduces the need for e-mail, fax, and telephone communication. Planners and buyers no longer need to focus on expediting orders, processing transactions and doing paperwork. Instead, suppliers have direct access to the information they need, when they need it. Planners and buyers now have the information they need to reduce inventory levels, shorten cycle times, reduce costs and meet customer delivery dates. Furthermore, standardized processes can be defined on a role-by-role basis within RapidResponse, letting users see only the data they need.

RapidResponse conforms to the user's unique business requirements. RapidResponse accelerates the transition to lean manufacturing because it supports common decision processes that occur across a manufacturing enterprise. It enables you to leverage the knowledge and experience of individual employees by capturing knowledge and "decision rules," making best practices available across the organization. This means the newly empowered users can make decisions quickly and consistently, which is an essential element of standardizing work.

The power and flexibility of RapidResponse also allow for ad-hoc analysis of almost any question. The powerful uses of RapidResponse to support lean, described in this white paper, all originated from Kinaxis end users deploying it to solve specific challenges.

A division reported using RapidResponse to convert a production area to lean and continues to use RapidResponse to recalculate Kanban sizes and to optimize work area material storage. The results, associated with making 30 products on the same line, have been impressive:

- Lead time reduced from more than 17 days to less than one (a reduction of 94 percent).
- On-schedule product completion of less than 70 percent was improved to 100 percent since conversion (more than 18 months).
- Significant improvements in quality.

In re-visiting the four primary functions in lean planning outlined on the previous pages, we can clearly outline the enabling capabilities offered by RapidResponse.

1. Design for Flow

RapidResponse has features that provide significant benefit in answering the key questions faced when designing lean production processes:

- RapidResponse's pegging capability provides complete visibility into which components are used for each order. Linking component usage to orders provides the point-of-use information for each component, which can be used to organize work areas.
- Kanban sizes are calculated as simple expressions based on projected component requirements.
- Exception monitoring. RapidResponse's flexibility and event-based triggers makes it an ideal platform to calculate and monitor key operational and strategic measures. Use it to issue alert messages if key measures fall outside target ranges. For example, managers can be notified if customer orders will be satisfied late or if inventory for any part is projected to be above or below acceptable limits.
- Analysis and simulation. RapidResponse allows your standard metrics to be applied to the actual production plan and to any number of simulations. Ad-hoc analysis can be performed easily by end users whenever they have a need to see information organized in different ways.

2. Order Promising

In most environments, it is extremely difficult and time consuming to project when customer orders can be satisfied (e.g. order promising). However, RapidResponse calculates available dates for all supplies and demands, reducing order promising to a simple process of checking a field on any supply or demand record.

The calculation automatically checks availability as deep into the supply chain structure as it needs to find supply. Constraint planning can be conducted with the addition of RapidResponse Constraint Manager—the calculation simultaneously checks materials and capacity availability, including automatically making sourcing decisions where more than one supply source can be used. RapidResponse Constraint Manager allows capacity to be defined easily, as time-phased rates for production and supplier constraints.

RapidResponse's order promising functionality also supports the concept of priority in supply allocation so that a high priority demand can be satisfied on time by consuming the resources previously allocated to a lower priority demand.

3. Communicating Requirements

RapidResponse supports visibility across the supply chain, allowing manufacturers and their trading partners to manage the entire value chain and to eliminate waste. Because suppliers have instant visibility into changing demand information and current manufacturing data, they can work proactively to ensure that parts and components are available on the shop floor as needed.

In addition to supply chain visibility offered by other systems, RapidResponse allows all stakeholders to interactively model the value chain to determine the optimal delivery dates and quantities necessary to fulfill customer demand before making commitments. This integration of supply chain partners into production process decisions enables the tight relationships needed to maintain a high level of customer responsiveness.

RapidResponse is noted for its power and flexibility, ensuring the right information is provided to the right people at the right time.

4. Clear-to-Build

Using RapidResponse's Clear-to-Build (CTB) functionality, you can define the particular definition of "clear" that you want to use. Common cases are:

- Components available in stock
- Components on order with a scheduled delivery
- Components being made with a scheduled completion
- Components can be ordered in time to meet requirements CTB information is calculated on demand and respects order priorities.

Users have found that checking CTB is one of the best processes for reducing work in progress —don't start work on an order until you know you have everything you need to finish it! By applying sorting and grouping to the CTB list within RapidResponse a production-ready dispatch list is available to pass on to the production floor to be executed there by the lean processes.

Automation: The Next Step in Lean

With RapidResponse, manufacturers and suppliers can automate common transactions to greatly reduce the hours and expense associated with manual processes. Manufacturers, suppliers and customers can exchange orders, schedules, inventory information, and other reports directly between systems. Automating these everyday transactions free up people to deal with exceptions, reduces the number of errors generated from manual systems and greatly improves efficiency.

RapidResponse supports breakthroughs in efficiency without putting a high cost burden on trading partners. Suppliers, customers and manufacturers can use disparate back-end systems and applications to automate data exchange. Unlike expensive proprietary technologies such as EDI, RapidResponse uses XML, a leading open standard for e-Business, to exchange information between systems. However, if a supplier has already invested in EDI, RapidResponse can work with EDI transmissions, converting them into XML and back into EDI in a way that is transparent to users.

Conclusion

Lean is a philosophy not a tool. In order to be successful, a company must adopt this philosophy and then use the tools available to apply the philosophy. If you follow this path, the benefits can be significant and can start within a few months. Whether you are transitioning your existing operation to lean or building a new lean-based facility, Kinaxis can help you. Kinaxis provides adaptable, enabling technology that accelerates the adoption of lean processes and facilitates ongoing future improvements.

ABOUT KINAXIS

Kinaxis delivers a comprehensive on-demand supply chain offering—RapidResponse—that enables manufacturers and brand owners to drive supply chain management (SCM) and sales and operations planning (S&OP) from a single system. Global leaders across a broad range of industries are using RapidResponse as a decision-making hub for the broader value chain and are realizing a competitive advantage as a result. Large manufacturing companies with complex supply chain networks and volatile business environments rely on RapidResponse for collaborative planning, continuous performance management, and coordinated response to plan variances. Learn more about the RapidResponse editions, or join the industry discussions on the Supply Chain Expert Community at: https://community.kinaxis.com/.

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Supply Chain Expert community

Join us online at the Supply Chain Expert Community to LEARN, LAUGH, SHARE and CONNECT.
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