

LEAN

MANUFACTURING:

“A systematic approach to identifying and eliminating waste through continuous improvement by flowing the product at the demand of the customer.”

--Lean Manufacturing Guide



This white paper takes us through the action stages of lean practices: implementing lean. This involves looking in depth at the 5 S's of lean, key elements to succeeding at lean, and the top reasons why lean fails.

Lean Simplified Part 2

This is Part 2 of a series of white papers on lean manufacturing.



Lean Simplified

Part 1

In Part 1 of the “Lean Simplified” series, we looked at manufacturing wastes, lean principles, and the benefits of lean manufacturing. While maintaining our objective of keeping the concepts of lean manufacturing simple, part two takes us to the action stage of lean practices: implementation.

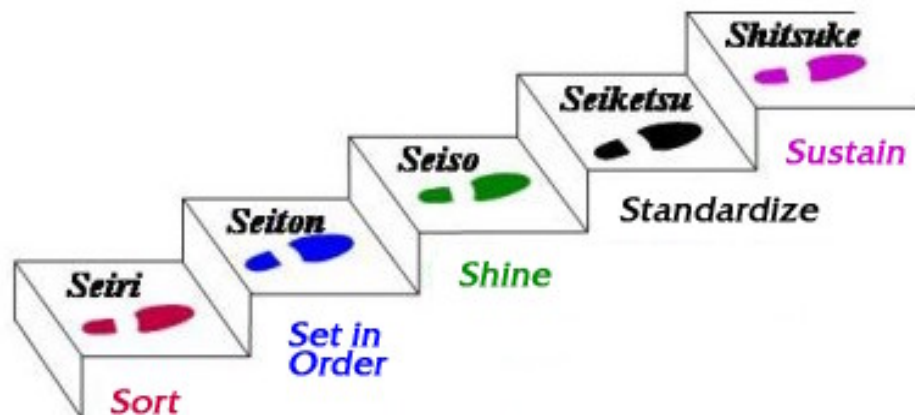
We’ll also see how the rest of the story unfolds for GPC. Having successfully completed phase one of lean, identifying wastes, GPC moved forward with the remaining phases, and is enjoying the benefits of their efforts.

The 5 S’s of Lean Manufacturing

Many companies start with a 5S program in implementing lean. Adherence to a 5S program establishes simple, easily understandable, and relevant objectives. It shapes the thought process that “all things that add value have a clearly defined place” and begins laying the foundation of discipline that is necessary for effective implementation of more complicated Lean tools such as Kanban.

The main purpose of the 5S program is to identify and create specific space for those items in the workplace that add value. It further ensures that the workplace contains only items that add value and that the workplace is maintained in this fashion over time. Once embraced as an ongoing operation practice, employees typically enjoy higher morale from improved environment and culture.

The 5 S’s are illustrated in this graphic:



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1. **Sort** – Sorting involves determining what is needed and what is not needed in a workspace. Anything that is unnecessary should be tagged and removed. The only items that remain in the workspace are the parts, tools, and instructions needed to perform the specific operation.
 2. **Simplify/Set in order** – Once the sorting is completed, the items that are determined necessary for that workspace need to be put into the correct position for use. This will maximize efficiency. A tool kept close to its point of use minimizes worker movement. Also, all items should be labeled for ease of locating and putting them away in order to save time.
 3. **Shine** – Shining refers to deep cleaning of machines and work areas to restore them to an “as new as possible” condition. The idea is that quality and efficiency will not suffer if the machine is not allowed to deteriorate over time, nor will the machine require as much maintenance. Additionally, having a clean workspace improves employee safety and morale.
 4. **Standardize** – Setting up a system for routine checks is the best way to standardize, or maintain, the lean practices already in place. This involves a checklist with instructions about what needs to be done, who needs to do it, and how and when it should be done.
 5. **Sustain** – Sustaining the 5S system is not difficult if the 4th S, Standardize, is adhered to. In addition, regular audits help to sustain the system as a whole. The audit relies on employee involvement. A rotating group of peers evaluates each component of the system and looks for deficiencies. The results are shared with employees and they are given the necessary tools and time to correct the deficiencies.

GPC conducts semi-annual 5S audits in each workplace. Results of the audits are displayed at various points throughout the facilities. A Kaizen room is maintained with sufficient tools and materials to allow employees to improve the appearance and cleanliness of their workspaces. This highlights management’s commitment to Lean as a long term continuous improvement program for the entire organization.

Succeeding at Lean Manufacturing

As with any program that a company wants to run successfully, the company needs to follow a plan of action. The steps, though simple, require dedication from all employees within an organization.

First, a company should have a vision which is consistently communicated and fostered by senior management. The vision should clearly define why the company is in business to anyone who reads it. It should be believable and easy to understand.

From this vision, a mission statement should be created. This mission should clearly express ‘how’ the company is going to achieve their purpose. Again, the mission should be believable and simple, but should express in broad strokes ‘where’ the company is going to participate in the market and how the vision (purpose) will be achieved. Lean manufacturing should support the concepts expressed in the mission (and vision) so that it is aligned with the direction of the company and its importance can be easily seen when reading the mission and vision statements.

In order for lean manufacturing to succeed there must be support from the highest level of management, including the company president and board of

directors. With this continuous support (and pressure) to implement and maintain lean manufacturing, the rest of the organization will always be reminded of the importance of the program. Without this support, lean manufacturing may be perceived as a “lower level” initiative, or a “flavor of the day” program.

Once high level management support is in place, a project champion from each functional area of the company should be selected. If the selected project champions do not follow through on commitments to the lean program, it often becomes a “production only” program. Often, project champions in other

functional areas such as accounting and sales and marketing have a more difficult time maintaining a focus on lean concepts. This becomes the beginning of a lean initiative that is viewed as a “production only” plan. The top management of the firm must hold project champions in all functional areas accountable for advancing lean concepts. From here, the firm needs to decide ‘how’ lean manufacturing will be launched into the organization. There are a multitude of Lean tools, consultants, and practices available across many industries.

In the case of GPC, a lean consultant was employed to discuss the various tools with the management

A Closer Look at Lean Tools

Kanban

Kanban is a signaling system to trigger action. As its Japanese name suggests, kanban (“kan” meaning visual, “ban” meaning board or card) historically uses cards to signal the need for an item. However, other devices such as plastic markers (kanban squares) or an empty part-transport trolley or floor location can also be used to trigger the movement, production, or supply of a unit in a factory.

TPM (Total Productive Maintenance)

Lean manufacturing depends on continuous flow of value. Any interruption to this flow is treated as waste. Certainly one common way that stops this flow in the manufacturing process is machine breakdown. TPM is a proactive approach that aims to prevent any kind of manufacturing slack before it occurs. Routine automaintenance ensures appropriate and effective efforts are expended to keep machines working as they should. Anything less than full working potential on a machine could mean full manufacturing line stoppage. TPM consists of three main areas: corrective maintenance, preventive maintenance, and maintenance prevention.

Value Stream Mapping

Value Stream Maps represent a key asset in implementing lean. These maps provide a picture of a company’s operations and how they relate to each other. It’s also key in discovering where in the company there is waste as well as helps the whole organization contribute to the value stream. Value stream mapping often begins as a group exercise. Many companies use a software system that allows template creation and printing to support both data collection and use of the templates on the wall for group activity. These templates make it simple to capture the resulting map for calculation, modification, visualization, and sharing. (See example on pg. 4.)

A3

A3 reporting is used to propose solutions, give status reports, and report results of information gathering activity in a graphic format that is easy to read and understand. When an A3 report is complete, it should display the problem and solution story all on one page, highlighting the changes necessary to solve the problem.

Additional Resources listed at the end of the paper.

team. 5S, TPM, VSM, Paynter Charts, and A3 reporting were selected as “starter tools” with which to kickoff the lean project. Once employees were trained and began using these tools, more advanced tools such as Kanban were implemented. Along the way, the company identified what did and did not work specific to their operation, and kept the value added portions of the tools while discarding those things that did not add value.

Why Lean Fails?

The single most significant reason for the failure of a lean system is not having everybody in the company “on board” the program. More often this breakdown comes from the senior management levels. They fail to take the time to fully understand lean, or they assume that the policies don’t apply to them and expect that others down the corporate ladder will do it all for them.

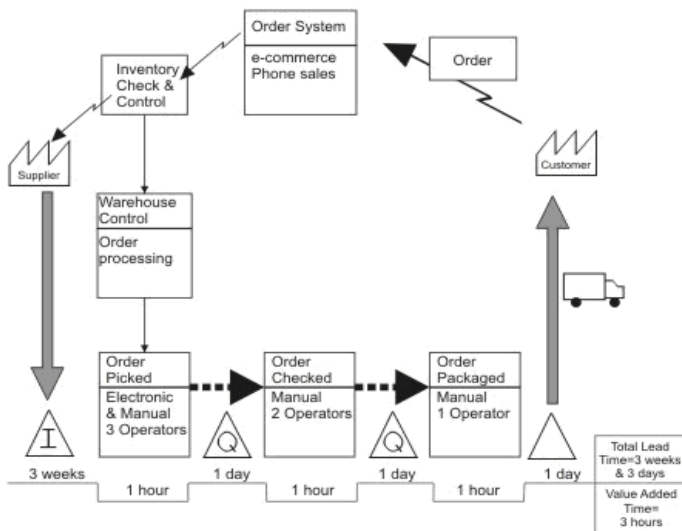
A second reason for the failure of a lean system is that managers will sometimes try and use just one component of the entire lean approach. For example,

a manager will implement the 5S element, but none of the others. See “Additional Resources”. All elements of the program are interdependent - each one crucial to the success of the other pieces.

Additionally, lean programs often fail for the lack of a sustainable long-term approach. In other words, management may be looking for short term, quick fixes, when in reality the true benefits of lean are realized through a long term shift in culture and improved operating practices.

The saying that “what works for one company may not work for others” is especially true for lean manufacturing. As long as people are encouraged to experiment, are given the freedom to fail and try again, are given sufficient tools for the implementation of lean, and are expected at all levels to continuously improve their processes and their workplaces, lean will succeed.

Finally, management sometimes fails to see how lean applies to the organization as a whole, and expects lean accountability from only the operations or manufacturing component of the company. Even though different departments may have slightly different goals and practices, every department utilizes processes and can benefit from the elimination of waste and non-value added components of those processes.



Software programs are available to draw Value Stream Maps. A set of shapes is typically used to represent various parts of the process. You may or may not want to use these, however it’s important to map your process clearly, and it’s also important to ensure that everyone understands what the symbols you use mean.

A Lean Journey

The management at GPC is pleased with the overall success of the lean program to date. They acknowledge that it is early in the lean journey. The company has benefited from reduced inventory expense and lower costs from improved operating efficiencies. But they still have many years ahead of them in Lean exploration and implementation. GPC is currently implementing intermediate lean tools such as Kanban and Value Stream Mapping, and have already realized early cost reductions.

Wrapping it Up

Having served as an introduction to lean manufacturing concepts, reading this paper is only the beginning of a new business journey. It's a journey that will bring companies and their customers together to create value and wealth for both. It's really a matter of every person within an organization putting the pieces into action, and keeping the process in motion, always striving for improvement.

—Charles Theisen, CPIM, CIRM

About the Author

Charles (Chuck) Theisen is a Supply Chain Industry Specialist with over 30 years of experience in Supply Chain operations and business systems. His operations experience includes production scheduling, materials management, transportation management, business system support, and business systems management. Chuck has many years of experience in Supply Chain operations and consulting including: warehousing, shop floor control, and related information systems. His consulting experience includes systems selection, implementation and usage, and operations and process improvement. He is a seasoned professional with strong communication skills, experienced in working with all levels in an organization.

Currently, Chuck is the Director of Implementation Services for ProcessPro, developers of ProcessPro® Premier ERP software. He works extensively with clients of ProcessPro to improve their Supply Chain effectiveness, with the primary focus being on Materials Management and Manufacturing Operations.

About ProcessPro

ProcessPro is the developer of the leading ERP software, ProcessPro® Premier, for the highly-regulated process industry. Excelling in the small to mid-sized market, ProcessPro provides an affordable ERP solution to those who must adhere to strict QC and government regulations including FDA, cGMP, 21CFR Part 11, Bioterrorism, HAACP, and more. ProcessPro® Premier seamlessly integrates all aspects of plant operations, from beginning order entry through manufacturing, packaging, shipping, and accounting.

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About GPC

GPC is a leading global supplier of paint solvents, test fuels, and recycling services for various manufacturing industries. Their customers include automotive manufacturers and suppliers, as well as chemical and pharmaceutical companies in the United States, Canada, Mexico, Europe, and South America.

The company has supplied custom-blended solvents, test fuels, calibration fluids, and refined products to the manufacturing industry for over 70 years. Its products are used in OEM assembly, engine, and component plants, and throughout the industry's supply chain.

GPC manufactures paint-related products and cleaners for a wide variety of industrial uses, as well as calibration testing and reference fuels.

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