

# LEAD TIME REDUCTION

A White Paper on  
the use of Kaizen



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# Annualized Cost Reduction

There is no doubt that we live in a global market. As companies in developing nations emerge on to the global industrial stage, it has become increasingly important to maintain an economic advantage over the competition. Some of the most powerful strategic advantages are: speed to market, cost, and quality. The ability to improve

these and still maintain a profit is one of the biggest challenges organizations face in today's market. In this regard, companies are forced to make continuous improvements to their processes in order to maintain current business and win future business.

## Challenges in Today's Market

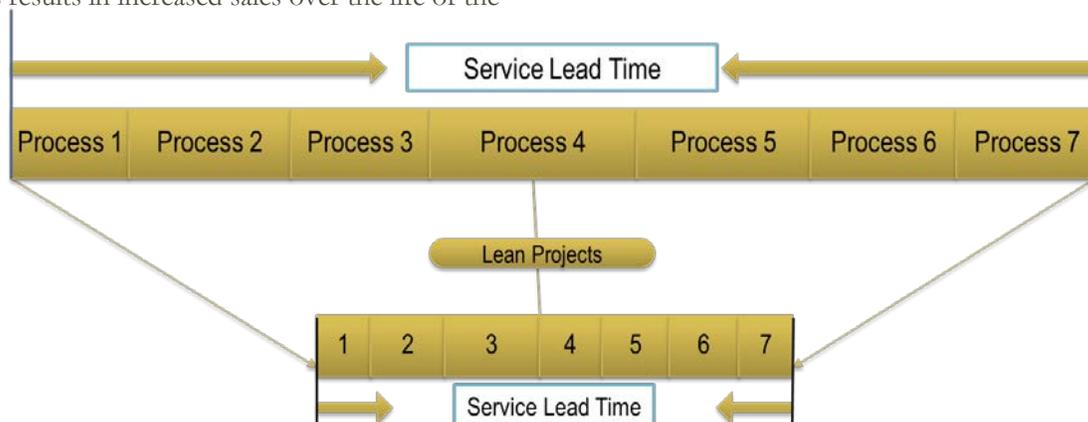
When developing new business with a client, the first questions they ask are: how quickly can you develop the product for me and what will it cost? This is common throughout many industries. Speed to market is one of the most persuasive marketing tools a company can tout. When offered the choice of purchasing the same product from two different companies, assuming all things equal, the preference will always tend to the one who can deliver the fastest. In some cases people are willing to ignore cost in order to get what they want as soon as possible. Take for instance, paying an expedite fee for having a package shipped overnight to you. You are willing to pay a premium in order to get your purchase faster. This is consistent whether we are talking about new product development or the sustainment of an existing product line.

Being the first to market something gives a company name recognition in a specific field. This results in increased sales over the life of the

product based on name recognition alone. Other benefits of quick product development are: satisfied customers, faster company growth, and more available resources. It is therefore critical for organizations associated with new product development to have a very fast speed to market strategy.

The same can be said about a reduced lead time for existing product lines. Lead time is the amount of time it takes from the receipt of an order to the receipt of payment.

The benefits of lead time reduction are: faster response to the demand of the customer, fewer resources (money and people) tied up in work in process (WIP), higher cash flow, and higher quality. It is easily understood that continuous improvements are necessary, but how are they attained? What tools are available to help achieve a higher state of efficiency within an organization?



# Kaizen: Change for the Better

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After WWII the American occupational forces in Japan brought in experts to help rebuild industry in the war ravaged nation. Among these experts were Homer Sarasohn, Charles Protzman, and Edward Demming. The focus of these experts was to teach statistical control methods to the Japanese. One of the training tools introduced was a film called “Improvement in 4 Steps”, which translates to “Kaizen eno Yon Dankai”. As this method caught on it was abbreviated to “Kaizen” and improvements were viewed as a continuous effort. This is where today’s Kaizen models emerged from.

The first large scale implementation of Kaizen, or continuous improvement, was in the Toyota production system and it was Masaaki Imai that made the phrase famous in his book *Kaizen: The Key to Japan's Competitive Success*.

From 1945 to 1978 leaders within the Toyota organization, namely Taiichi Ohno, developed and refined the discipline of Lean Manufacturing, turning Toyota into a world class leader in

efficiency and quality. During this period Toyota was able to decrease lead time on their production line by 87% and increase throughput by 74%. This was the beginning of a new age in best practices.

Soon after the published success of Toyota, other automobile manufacturers adopted the practices. Along with them followed their suppliers and the supplier’s suppliers. Soon a revolution began in the refinement of processes across many different industries. Now organizations from every field are embracing the concepts of Lean Manufacturing and at the heart of this, Kaizen.

This emergence of best practices has led to the development of books, training videos, classes, and consulting firms all teaching organizations the implementation of continuous improvement techniques. So how do you know which one is best for your organization? How can you be sure these practices can be adapted to meet the specific needs of your organization?

## The LSSE Implementation of Kaizen

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With so many different options available to choose from, why choose LSSE to partner with? The answer is simple: LSSE has a record of success. In over 20 projects we have saved an average of \$152,000 per project, reduced lead time on average by 75%, and improved productivity by 70%. LSSE uses a five day Kaizen Event structure in order to educate and improve.

Kaizen can mean many different things to people. It can mean anything from slow and steady general improvements to rapid and focused events. At Lean Six Sigma Experts we’ve found that the most successful implementation of Kaizen is an intense multi-day event that usually lasts a week. These events are focused on specific goals and eliminating wastes. They consist of a cross functional team that not only participate in the event, but are taught the basics needed to become lean practitioners, thus building a base for establishing a lean culture. Improvements made during this week long event are designed to show immediate return on investment and will increase profitability over the life cycle of the product or service.

## Monday – Training

- General Concepts Review
- Project Specific Training

The first day of our week-long event is spent in training. This time is used to learn the basics of what lean is and how it can be applied to your specific organization. This is designed to give your employees operational knowledge of lean manufacturing and will begin the transformation into a lean culture.

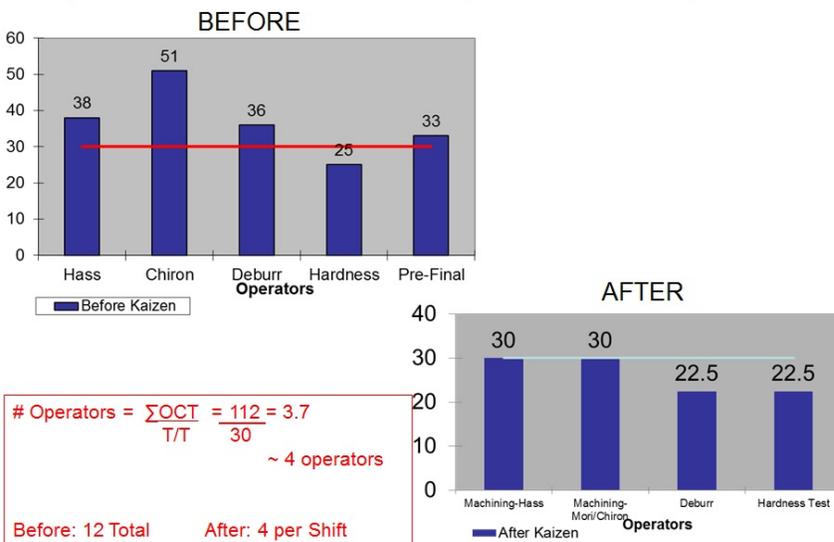
## Tuesday – Current State Analysis

- Current State Process Data Gathering
- Formulate Future State

The second day is spent capturing the current state of the process and formulating a future state. A process flow map will be made that includes a count of WIP, cycle times, distance traveled, 5S current state, and identification of waste. After a baseline is established we will begin formulating a future state layout. This will potentially include the movement of equipment or furniture, new documentation or process tools, fixtures, gauging, and new process flow.

During this second day participants will be learning the importance of process flow, standardized work, Takt time, operator cycle time, cell layout, and operator balance.

## Operator Balance Chart (Before/After)



## Creating a Cell

- Define and understand a clear process flow
- Identify wastes
- Standardize work
- Calculate Takt
- Calculate operator cycle time
- Balance the operations
- Implement controls to maintain the solution

### Calculating Takt Time:

$$\text{Takt Time} = \frac{\text{Time Available}}{\text{Customer Demand}}$$

Takt time sets the rhythm of the cell. It is essentially the metronome that keeps the pace needed to meet demand.

### Operator Cycle Time:

The total time it takes an operator to complete one cycle of all the standard work associated with a defined task.

Level out the work load so each operation can meet Takt time.

## Wednesday – Future State Implementation

- Simulate Improvements
- Actual Implementation of Future State

Day three is the implementation of the future state plan. Take everything apart, eliminate the wastes, and put it back together in a way that is better than it was before. This is when cells are created, work flow is streamlined, and a new standard work procedure is outlined.

### Before



### After



## Thursday - Validations

- Run & Validate New Process
- Refinements & Standard Work Development

On the fourth day we will establish a new process baseline taking new cycle times, WIP counts, distances traveled, 5S, and waste counts. This is meant to prove the theoretical optimum process actually works. Changes may be made on the spot to account for unseen obstacles that weren't identified during the planning phase. This is also time to implement a control system designed to maintain the effectiveness of the event.

SQDC Boards can be used as a sustaining tool

Safety Quality Deliver Cost boards are high visibility tools used to track a cell's productivity.

They are designed to give a Supervisor or Manager a window into the performance of the cell that can be read in 2 minutes or less.



## Friday - Report-out

- Report results
- Celebrate success!

The final day is a chance to complete any activities that are outstanding and formally report out the results of the event to upper management. The team will celebrate its success and use this event as a springboard to launch new improvement initiatives throughout the organization.

<b>Improvement Measurement</b>	<b>Before Kaizen</b>	<b>Kaizen Objective</b>	<b>Actual Achievement</b>	<b>% Improvement</b>
Productivity (Parts / Labor Hr)	11.7	+25%	19	+62%
Work In Process Inventory (pcs) WIP \$	11,800- 17,000 \$185,000	-50%	<1500 <\$12,000	~90% \$173,000
5S	<1	+1.0	3.6	
Safety / Ergonomics	-	8	8	
Profit Margin	-3%	-	+19%	
Lead time	~4 weeks	-25%	< 2 days	-93%

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