

Lessons from a

LEAN CONSULTANT

**Avoiding Lean Implementation
Failures on the Shop Floor**

CHRIS A. ORTIZ

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Preface

By itself, implementing lean manufacturing on the factory floor will not generate the desired results unless certain systems are in place, production support staff operate efficiently, and the operators are fully engaged and committed to the change. As a lean consultant, I have traveled around the country and have seen a variety of companies and manufacturing operations. Each one was unique in its approach to lean manufacturing.

I am often asked why some companies are successful and others fail in their lean implementations. Or more simply put, what did they do to get the results they obtained?

Lessons from a Lean Consultant outlines the fundamental mistakes companies make in trying to implement lean manufacturing. I provide solutions for upper managers, engineers, and supervisors who are struggling to keep their lean implementations afloat or are looking for advice on how to mold their production operators into the powerful change agents they need to be. *Lessons from a Lean Consultant* helps prepare managers for working in a lean shop floor environment. Lean succeeds or fails depending on the commitment from management. Dealing with the ups and downs of lean implementations can be tough. This book shows what is expected of managers and their subordinates.

From my perspective, the lean manufacturing training and consulting business has changed over the years. It used to be common practice for companies to spend tens of thousands of dollars on individuals who taught generalized, theory-based curriculums. I am not implying that all consultants operated in this manner, but many did. This type of training and guidance has become outdated, and companies are looking for hands-on approaches to lean training.

This change in the market has affected my books on lean manufacturing. I saw this market transformation about two years ago and wrote *Kaizen Assembly: Designing, Constructing, and Managing a Lean*

Assembly Line in an attempt to cater to the nuts-and-bolts needs of the market. *Lessons from a Lean Consultant* takes the same approach to lean management and culture change, providing detailed, real-life solutions to those who are struggling with workers who do not want to adapt to lean methods or adhere to the systems and procedures in place. In short, this book takes a nuts-and-bolts approach to lean management and culture transformation.

Chapter 1 briefly tells the story of how an attempt to implement lean manufacturing failed in a company for which I was the senior lean manufacturing engineer. Chapter 2 lays the foundation for the book by outlining the importance of meeting customer needs and developing a competitive balance between cost, quality, and delivery. Chapter 3 provides a step-by-step guideline to creating a company kaizen program, an organization's foundation for continuous improvement. Chapter 4 helps the manufacturing professional identify the early stumbling blocks that commonly occur during the planning and implementation of lean manufacturing in a factory environment. This chapter defines the cornerstones of the early stages of lean manufacturing: 5S, visual management, data collection, waste removal, and process design.

Chapters 5 and 6 illustrate the importance of developing a relationship with your line operators and teaching them how to work and interact in a lean process. Success requires solid up-front planning and training of existing and new employees. Chapter 7 feeds off of Chapters 5 and 6, explaining in detail the incentive and pay-for-skill systems that help you encourage cross-training and develop a flexible workforce.

Chapter 8 takes a unique approach to lean leadership. This chapter emphasizes how the best leaders treat people, with or without a lean journey. In short, if company leaders manage through negative reinforcement, the organization will struggle to adapt to a lean culture.

Appendixes A and B illustrate forms, documents, and templates that are useful during your lean journey. The Glossary lists and defines the key lean terms you should know.

It's my hope that professionals working in the manufacturing sector holding titles such as plant manager, engineering manager, lean manager, and even lean engineer will find value in this book. My goal is to provide a tool for creating a solid lean program in which the people in direct control of its success are driving the improvements, thereby ensuring that their implementations endure and prosper.

Introduction

At first glance, lean manufacturing appears to be a magic solution for the numerous problems experienced in many factories. A powerful and effective improvement philosophy, lean manufacturing can prevent company failure—or catapult a business into the status of a world-class organization. It's well known and widely accepted that many improvements—such as enhanced productivity, improved quality, shortened lead times, and reduced costs—are the direct result of employing lean manufacturing methodologies.

Without a doubt, embarking on a lean journey is a wise choice as well as a bold one. It is important to recognize, however, that not all stories end in success. Although few people in the manufacturing environment realize it, there are many failures and struggles in implementing lean methods on the factory floor.

Admittedly, it's tough to acknowledge failure, but it's the failure of lean implementations that have provided valuable insight regarding what not to do when you're doing lean. The key to success is total commitment to the process, and not only from management. Although management is the main driver for all lean initiatives, success depends on dedicated focus by engineers and supervisors and full engagement by line operators and other product building personnel. However, it is hard to remain dedicated to the effort if errors were made in the implementation or if the appropriate systems are not in place to provide adequate support, monitoring, and the ability to make ongoing improvements.

Lean manufacturing is successful only when the individuals running the business are committed and dedicated. Implementations fall apart because of lack of management support, poor procedures and standards, and lack of accountability and vision. In truth, we must admit that lean

manufacturing has failed in many companies, even though the importance of management's commitment to lean is not a new concept. It has been repeated over and over, almost like a broken record, especially when we compare U.S. manufacturers to their competitors in industrialized nations such as Japan, which was the pioneer of what is now known as lean and kaizen.

This fact by no means diminishes the years of effort in developing methods such as the seven deadly wastes, 5S, kaizen, waste reduction, single piece flow, and visual management. However, it is time to take the concept of lean management down to a level that focuses on the people who can make, or break, an implementation. Workers need a solid understanding of lean manufacturing, and training of all employees involved in manufacturing operations is critical. Typically, companies train only the individuals who are responsible for the initial design and implementation of the lean manufacturing systems and neglect to formally train the line operators, giving them only quick, on-the-fly training that is more likely to confuse and frustrate them than adequately prepare them for the new process.

Plenty of books are available that address the general issues of the struggles of implementing a lean strategy. They provide good direction for creating the overall lean strategy, but what about those who work on the shop floor, day in and day out, during the lean implementation and afterward? How do you deal with operators who do not buy in to new ideas? Why does your production supervisor avoid holding employees accountable for making mistakes and ignoring standard operating procedures? And why doesn't your production manager hold the supervisor accountable? Why did the 5S program fall apart? Most importantly, why has the company been unable to achieve the shop floor performance that was originally estimated? These problems stem from the people factor of a lean implementation. That's what this book addresses.

As a manufacturing professional, you probably know that implementing 5S, single piece flow, visual management, and other lean philosophies will help significantly reduce process inefficiencies. You must conduct solid up-front planning—in the form of training and data collection—and monitor the process closely. Sometimes, only a slight tweak here or there is all you need. Rather than detail the infinite attributes of the lean enterprise and overall change philosophies, this book turns lean management into lean mentoring. It guides you through the critical

aspects of early design and data collection and provides clear, simple rules for sustaining the new processes after they are in place.

The most common struggle in a lean journey does not typically occur during the learning phase. I have been a lean manufacturing trainer and consultant for some time now, and we are a dime a dozen. You can find efficiency consultants anywhere. Most manufacturers have come to realize the benefits of a lean approach and have employed the finest talent to implement it. Most of your employees—engineers, technicians, production managers, engineering managers, and plant managers—have the ability to grasp the fundamental concepts of lean manufacturing and can envision the impact it can have on organizational performance and financial strength. Often, what's missing from many lean manufacturing programs is the final piece of the puzzle: a company kaizen program.

If you have read my first book, *Kaizen Assembly: Designing, Constructing, and Managing a Lean Assembly Line*, you know that I am a strong advocate of kaizen (continuous improvement) and the use of kaizen events to implement lean manufacturing in an efficient and organized manner. That is why this book explains in detail the concept of kaizen and kaizen events. Kaizen events themselves are an effective method of accelerating lean implementations. However, it is important not to get stuck in “event lean,” in which improvements happen only in scheduled phases. This is why it's crucial to understand the differences between kaizen and kaizen events, something you'll learn in this book.

I've also written this book to help the manufacturing professional identify the early stumbling blocks that commonly occur during the planning and implementation of lean manufacturing in a factory environment. Companies often are eager to adopt techniques such as 5S, visual management, data collection, waste removal, and process design, but they learn and implement them in the wrong manner. For example, many companies achieve the first four S's of 5S (sort, straighten, scrub, and standardize), but the program falls apart because no one is made accountable for the fifth element: sustain.

Here's another example. Gathering current state data is essential to improving performance, but the information is either not available or is collected improperly. To achieve a smoothly run operation, you must accurately identify waste and eliminate it from the process—a difficult task that also can be done incorrectly. In this book I outline the fundamental aspects of 5S, visual management, data collection, waste

removal, quality at the source, and workstation design in words that are clear and easily understood.

Other keys to success include installing support systems, ensuring that production support staff operate in an efficient manner, and making certain that operators are fully engaged and committed to the change. To this end, I explain the concept of standard work, an agreed-upon set of work procedures that outlines the best, most reliable, and safest way of doing work for production operators.

Training new and existing employees takes on a whole new meaning in a lean environment. Whether they are hourly operators or salaried support staff, your employees need to understand the fundamentals of lean manufacturing. Operators should no longer be trained simply on how to build product. They must interact in a process that is highly organized and monitored by procedure and structure. I describe how to develop a comprehensive lean training program for new and existing employees as a critical part of any lean organization.

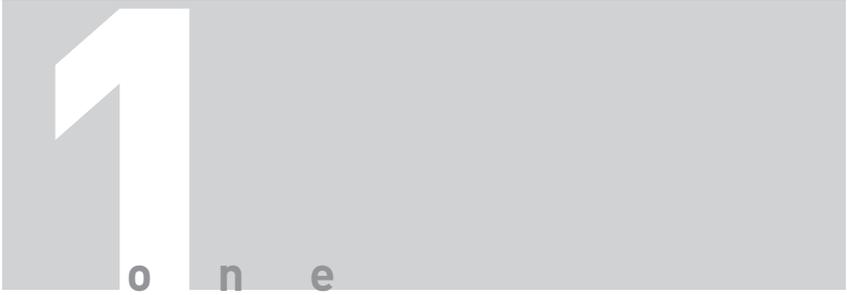
Although temporary workforce layoffs are common after lean manufacturing implementation, truly lean, world-class factories can actually create new positions and jobs. Lean organizations understand that continuous improvement is a long-term journey that will create new jobs, jump-start new product lines, increase wages, and develop a strong workforce.

Another important attribute of lean manufacturing is the benefit of flexible operators, line leads, and line technicians. Flexibility is the key to working effectively on a lean shop floor. Operators can no longer become comfortable performing only one operation or working in only one area. Lean organizations need to cross-train operators and supervisors to allow people to be moved or shifted to accommodate seasonal production levels and absenteeism. Because flexible employees add value to the organization, an incentive program should be in place to encourage continuous learning. A cross-trained, flexible workforce helps a company maintain efficient performance levels on the shop floor. This book provides a guideline for preparing a pay-for-skill program that will encourage your people to learn additional operations and become more flexible and valuable to the organization.

Managing in a lean manufacturing environment is tough, especially in the beginning stages. It can be filled with heartache and pain. The people element is vital, and there is no perfect template to go by when

you're dealing with the various attitudes and personalities you will encounter. I discuss the typical mistakes managers make when preparing for lean implementation and offer ways to avoid them.

This book is based on years of lean and kaizen experience—what I witnessed during lean implementation struggles and how those struggles were overcome. To finally realize the positive results you have been promised, your lean program requires strong management commitment, the use of kaizen events, accurate early planning, and a comprehensive lean training program backed by constant monitoring and accountability. It's my hope that this book will become a powerful mentoring guide to focus your efforts in the right direction and ensure that your lean manufacturing journey is successful.



Case Study: How Lean Failed

Adopting lean manufacturing is a journey. Sometimes, even the terminology is confusing, including a phrase in the title of this book: *lean implementation*. The best way to clarify is to say that a lean journey has multiple lean implementations that take place throughout an organization. But no matter how we phrase it, lean implementations can fail, bringing the journey to a halt. Throughout this book I discuss a variety of challenges and common failures in implementing lean manufacturing. I hope my experience will help you get a firmer grasp on what not to do and also will provide guidance for your lean journey.

My career has taken me all over the United States, and I have had the opportunity to meet many professional people and to work with numerous organizations. Each of them experienced successes, as well as challenges, when embarking upon their lean journeys. This chapter tells the story of a heating and air conditioning company in the Southeastern United States that I will call X-Corp.

This company began its lean journey with a lot of enthusiasm. It hired multiple consultants and trainers and scheduled and conducted numerous events, investing much time and money in the effort. This story isn't an attempt to downplay X-Corp's hard work, its commitment to its employees, or its contributions to its community. It is simply a great

example of an organization that struggled to implement lean manufacturing but did not experience the desired success.

Gung Ho!

Before starting Kaizen Assembly, my lean manufacturing training and consulting company, I held a variety of positions in the lean field: lean engineer, kaizen coordinator, and corporate lean champion, to name a few. I was involved with lean manufacturing for approximately four years when I was hired at X-Corp as a senior lean manufacturing engineer.

X-Corp embarked on its lean journey in early 2002. I came on board as a permanent employee in January, intending to be one of the organization's main drivers of lean manufacturing. The company had a new plant manager who had a strong desire to implement lean on the production floor. Having a strong background in continuous improvement, naturally I was delighted at the prospect of working with him. He scheduled a meeting for late February to discuss the schedule for the year with upper management. I was invited to the meeting because I was the lead lean engineer on the upcoming projects. X-Corp had also hired a lean consulting firm to help with the journey.

Most of the managers in the room were not aware of lean and appeared to be confused about the goals that were being presented. The plant manager explained that the consulting firm would send its top advisers to the plant during the weeks we were to have kaizen events (improvement projects). I believe that X-Corp paid the firm approximately \$12,000 per kaizen event. In addition, X-Corp planned to invest in a series of training sessions that taught value stream mapping, time studies, and visual management (covered in a moment). The training was to be completed before the first kaizen event. With these measures in place, it appeared that X-Corp was moving in the right direction: setting the vision, training the workers, and then implementing. The process was familiar to me, and I totally approved.

Lean Training

After a series of meetings with upper management, everyone became acclimated to the concepts of lean manufacturing and understood why lean is so important. So far, the journey was very positive and

rewarding. The plant manager, through his personal commitment to the vision, had generated a sense of passion in upper management, a critical factor in these early stages. With everyone committed, the next item on the agenda was training.

Visual management was the first training to take place. **Visual management** is a philosophy that outlines the importance of making a work area more organized and less cluttered visually so that workers can see problems more quickly and react sooner to rectify them. The company had selected two managers to attend the workshop. That was a mistake. When you train employees on the concepts of lean manufacturing, it is important to involve many people, from various departments. In this way, the trained individuals can return to their respective departments and train additional employees. These trained employees will then be able to lead your lean improvement efforts.

The plant manager sent the production manager, the engineering manager, and me to the visual management workshop. After the training, we returned to the plant, excited about all we had learned. The workshop focused on 5S and the visual workplace. **5S**, the key foundational lean practice, is a philosophy of organization and cleanliness that should be implemented across a company. The five S's are sort, straighten, scrub, standardize, and sustain. Although the trainer never used the term *5S*, I knew exactly what she was emphasizing. I realized that 5S was not only needed on the factory floor but also had to be one of the very first initiatives.

The next round of training focused on **value stream mapping**, an extremely useful tool. In this practice, a team creates a map of the current state of a specific process or area; eventually these **current state maps** are used as part of a kaizen event to implement lean improvements. The consulting company hired by X-Corp conducted this training, as well as the reinforcement activities. In contrast with the visual management training, this time X-Corp filled the room with every manager, engineer, and line lead available.

Everyone was quite engaged in the training, and multiple teams were dispatched across the plant to perform the exercises. Once again, everything seemed to be moving in the right direction from a project management perspective.

When the two-day on-site workshop concluded, each team presented its findings, showing areas of waste that needed to be removed or

significantly reduced. There was plenty of opportunity for improvement. Most of the current state maps identified issues with inventory, supplier lead times, overproduction, and excessive wait times in the stockroom. The production lines also had ample room for improvement, but the biggest opportunity was outside of manufacturing. Even so, a decision was made to redesign the assembly lines first and postpone improvements in order processing and inventory.

Based on this decision, X-Corp shifted gears, scheduling an on-site time study as well as data collection training, which I considered to be the nuts and bolts training for the journey. Although I was not completely disappointed with the company's decision and change of focus, I would have preferred to see some effort devoted to inventory issues. It would take time to resolve the inventory problems and supplier issues, but I thought one team could have started working on that area. No matter how much X-Corp refined its production lines, if there was an insufficient quantity of good-quality parts, operations could shut down. Although I felt strongly about this, I embraced the decision and maintained my passion for the journey as we proceeded to the task of data collection.

Data collection training went very well. X-Corp registered a lot of employees for the on-site training. The instructor taught everyone how to perform time and motion studies and how to identify waste-removal opportunities from the collected data. Having conducted hundreds of time studies before my employment with X-Corp, I knew how critical the information was for implementing lean manufacturing and removing waste.

The training class was divided into six groups. After one-half day of training, the groups were sent to the production floor to conduct the studies. X-Corp had chosen to send the same people who had participated in the value stream training—a wise decision. Each team was assigned to the process for which it had created current state maps.

I was assigned as the leader for the engine line team. There were four models of engines, each distinguished by a handful of options. The engine, hoses, valves, clamps, and other main components of the engine were all standard. The team gathered the necessary assembly information for each of the four models.

The assembly line was quite long and allowed the buildup of **work in process** (WIP). It was obvious that single piece flow should be

implemented to resolve this issue. In **single piece flow**, products are built or assembled one at a time. A single unit is allocated per workstation, with no units allowed to accumulate between workstations. The team also noted that the line operators often left their workstations for non-work-related activities such as taking extra breaks, chatting with passersby, checking personal cell phones, and so on. The team recognized that there were many opportunities for improvement.

X-Corp appeared to be headed on the right path. The plant manager's demonstration of passion and commitment had set the right tone for the journey. The organization was now trained on three major lean topics: visual management, value stream mapping, and data collection. At this point in the game, we were ready for our first kaizen event.

The First Kaizen Event

At this point in X-Corp's lean journey, things were moving along fairly well. We would have benefited from additional training on other lean topics, but, after only three months, the company had made significant progress and team members were still passionate about the journey. But I knew that many companies begin down this path with a lot of zeal, which tends to start fading a few months into the process.

The first kaizen event was scheduled for mid-April, and my excitement was mounting. The lean consultants were scheduled to be available during the week-long event. When a company hires a lean consultant or firm, it is critical to identify its expected level of involvement. When I later became a consultant, I made it my responsibility to guide my clients in the right direction, even if it means rolling up my sleeves and diving in with them. Unfortunately, some consultants are not as involved in the actual process, and many do not provide the level of leadership or direction needed during a kaizen event. Sadly, this was the case at X-Corp. It was during the very first kaizen event that I felt the path for success begin to change direction.

The consultants made a big mistake: They never gave us formal training on kaizen or on how kaizen events are conducted. Our expectation was that we would take the information gained from the value stream mapping and data collection exercises to initiate improvements. Four teams were established, again consisting of the same employees who had participated in the prior training and exercises. Then, as odd as it may seem, the consulting company instructed X-Corp to discard any

information that we had obtained. The consultants wanted the four new teams to collect their own information on the first day of the event and then use the data to generate ideas for the rest of the week.

This is traditional kaizen consulting, in which most of the planning is done during the first day of the event. However, in my professional experience, I have found significant value in performing a current state analysis before the event (see Chapter 4), and I highly recommend using this process rather than the traditional approach. The new teams can always find additional ways to improve the process. In the case of X-Corp, the change in direction caused some irritation for those who had performed the earlier analysis, and many felt a bit soured on the whole process.

In an attempt to lift their spirits, I brought my team members together one week before the kaizen event and explained that we would be using the information previously collected. Although everyone was still excited, the group, as a whole, seemed to have lost some energy.

The first day of the kaizen event arrived, and the teams met with the lean consultant to prepare for the week. Except for me, no one had any idea what to do or what was expected. The consultant gave a short inspirational speech on lean manufacturing, and then we were excused to begin our projects. As the team members slowly left the training room, it was apparent that they were confused and unsure of the next action.

I quickly assembled my team and explained that we needed to assess the work content we had captured in the time and motion studies. This information would help us balance the work evenly among the workstations, allowing us to identify what was needed to perform the work. Basically, we were going to sort the area and discard all the unnecessary items from the engine line. This made sense to the team, so we quickly headed for the engine line.

After calculating **takt** (the cycle times for the workstations; discussed in detail in Chapter 5), I divided the team into two groups. We found an area in the plant where we could place the unneeded items. One group remained in that area. The other group took responsibility for identifying unneeded items and removing them from the engine line area. Fortunately, we had two line operators in this group to assist us. The group in the removal placement area simply received the items and then organized them. This system worked very well.

The other kaizen teams, however, were struggling, because they had no direction and no idea what they were supposed to do. The consultant simply walked around and made useless comments to the teams, usually pointing them in a direction that was not correct. Each team had current state data from their respective areas but did not use it because they had been told to ignore it. Clearly, this was a bad beginning for X-Corp's journey and not good for the first kaizen event.

The teams struggled to understand why they were not allowed to use the up-front planning information they had gathered. Over the years, experience has shown me that up-front planning is important. Therefore, I have ignored the traditional kaizen approaches and developed my own system. The traditional approach allows the teams to come up with improvement ideas, on their own, during the kaizen event. In my opinion, you can still get this benefit even after using current state data on the respective process.

After the first day, my team had made significant progress. We had successfully removed all the unnecessary items from our assigned area except the old conveyor. While we waited for the line workers to finish work for the day, I took the opportunity to visit the other teams and my colleagues in the other areas of the factory. They were confused, and the consultant was giving them no direction. Actually, he had left to have dinner with the plant managers and was not planning to return until the next morning. The team leaders assembled for a talk. I explained that our team was using the data collected during the last few months and was moving ahead. The other team leaders saw that this was a good approach and agreed to begin using their information. With management out of the picture for the time being, all the teams started crunching numbers and coming up with line layouts. They worked until about 9:00 p.m.

As the second day began, most of the teams were unhappy with the guidance they had received from the consultants and upper management. It was the consensus that if we had not been told to discard our data, we would be less tired and farther along in the kaizen event. Nevertheless, the clock was ticking, so the teams kept moving.

The teams worked mostly on their own, with a few breaks for meaningless meetings with the consultant. During these meetings, the consultant asked for status reports and gave advice on what the next steps should be. When the consultant offered a smart suggestion, it was either one

that had already been implemented by the teams or one that had been mentioned by an employee. Members of upper management, who had not paid attention when a suggestion was originally given, now saw the suggestion as valuable because it had been offered by the consultant. Funny how that works.

With two days completed, the teams were progressing much more smoothly, but, even so, many of the employees were unhappy with this kaizen event. Everyone pushed ahead.

Days 3 and 4 found us facing some of the same challenges. The consultant continually redirected the teams with useless advice. It sometimes appeared that he was trying to prove his worth and justify his price. But each kaizen team had solid team members, and they were all making good decisions on their own. Many of them relied on my input, because I was experienced in kaizen events and believed in a different approach to implementation.

Every night, upper management and the consultant left for dinner at approximately 4:30 p.m., and the teams stayed late, continuing to work. Working late at night is another older kaizen approach, one that is quickly losing its appeal. The old approach requires long days and evenings because no up-front planning is allowed. In contrast, preparing for kaizen events in advance leaves plenty for the team to do during the event but allows for a smoother implementation and avoids long working hours. Working the teams sixteen hours a day during kaizen events does not instill enthusiasm and excitement, nor does it bring about dramatic change in the company culture.

When Thursday arrived, the teams were finishing up their areas. Each team had made improvements to flow, workstation design, inventory quantities, 5S, and standard work. The teams were asked to arrive early on Friday morning to begin assembling their reports. It was a mad scramble. The consultant wanted all the presentations ready by 9:00 a.m. so that he could catch an early flight home.

Each team presented its project, and the company was happy. As always, there were some unfinished items, but the event was considered a success. Directly following the presentations, the plant manager announced that the consultant wanted to tour all the areas. This was a surprise to the teams. The team members ran off to clean up their areas, and chaos ensued. The tour was very fast. The consultant quickly walked through each area and then prepared for his departure. He

mentioned how hard everyone had worked and wished us luck in preparing for the next event, which would be sometime in June.

I was frustrated with X-Corp's first approach to a kaizen event. From my perspective, it appeared that the company was simply trying to impress the consultant rather than use him for advice.

Most of the team members, too, were unhappy with the consultant, the company, and their bosses. They were tired and simply wanted to go home for the weekend. They were relieved it was over.

Struggling with Change

Things returned to normal after the kaizen event. Employees returned to their regular jobs after wrapping up loose ends. At this point, I had drawn a few conclusions. First, hiring a lean consultant can be very helpful for your lean journey, but only if you select one who is knowledgeable and proficient, provides hands-on consulting, and has excellent communication skills. The kaizen teams from X-Corp's first event were in constant confusion, and for that I fault the company managers as well as the consultant. They provided either no direction or bad direction.

Second, the company was more concerned about impressing the consultant than listening to its people. Because of the training that everyone had received, each team had solid performers who generally knew what needed to be done. Third, it was apparent that we needed a comprehensive company kaizen program (as explained in Chapter 3). Unfortunately, on this journey, communication, scheduling, team member selection, and up-front planning were minimal. And fourth, X-Corp did not establish goals for the teams or metrics for measuring progress. Chapter 2 describes the strategic purpose of lean manufacturing and explains why it is critical to establish key shop floor metrics. X-Corp had no strategy in place for this, or, if it did, the kaizen teams knew nothing about it.

A company's first kaizen event can be difficult even with a kaizen program in place, so it is important to point out that X-Corp was trying. The company had simply started poorly, and as the senior lean engineer, I needed to recharge and get back on the horse.

X-Corp had now entered the sustaining period. The engine line had gone through a major change, not only in flow and standard work but

also in the physical layout of the line, forcing the operators to work as a team. The old layout had allowed operators to build as much WIP as possible on the long conveyor and then walk away. The kaizen team implemented a mobile assembly process, in which the engines were removed from a tote and placed on customized carts designed specifically for the engine line. The line used only seven carts, which moved single piece flow through the six workstations and left no room for WIP. The seventh cart was usually in queue at the first workstation. As the final workstation completed its work and placed the engine into the main assembly process, the line supervisor brought that last cart to the first workstation and placed it in queue.

After the redesign, the space was much more confined but still large enough for the operators to work, maneuver the carts, and find tools and parts. Typically, the line lead stood around watching the assembly of the engine; therefore, he was assigned as the materials handler. We established a three-hour parts replenishment rotation so that he had ample time to address issues as they arose and circulate the carts as needed. All these changes meant that there were many new procedures and protocols to follow.

The operators firmly resisted the modifications, as did the line lead. With the new layout, flexing was now an absolute necessity in order to keep the line moving. **Flexing** is an industry term that simply means “the movement of workers.” It is a movement between workstations as needed to ensure that product flows evenly. It is an automatic response to bottlenecks in flow. This was a hard concept for the workers to comprehend. Management had not trained them on flexing or how to identify bottlenecks in the process. Most of the production workers had received very little hands-on lean training, and this was unfortunate because it would have been directly applicable to their environment. There was no system in place to bring the operators up to speed. There were operators on the kaizen teams, but that was the extent of their participation. Therefore, after the changes were implemented, they fell back on old, established patterns of operating, and this created a multitude of problems on the new line.

It was still common for workers to leave their workstations even though the line was under single piece flow and flexing rules. Operators would also leave to retrieve their own parts, because the line lead had refused to take on this new role. Flexing was virtually nonexistent, and many times an operator would stand in the workstation, waiting. The line

lead did not make people accountable, the supervisor was rarely available to advise the line lead, and the production manager was never involved. With no accountability and no actions taken to eliminate the resistance on the floor, output and quality suffered.

The need for culture change is the hardest part of the lean journey, and the plant manager and upper management simply did not address this issue enough. Production people were allowed to do as they wanted, and, ultimately, the line's poor performance was blamed on the kaizen teams. Several meetings were held in which the manufacturing engineer and other kaizen team members expressed their dissatisfaction with how the lines were being managed. They complained that the operators and line leads were not following the work content, were refusing to flex, and were still leaving their workstations.

As the lean engineer, I continually advised management to train the operators more formally. I explained that the workers were given a new process and were expected to follow the rules without any notice or upfront training. The problems that the line faced were a result of management's poor planning as well as its approach to employee resistance. The engine line and other newly developed lean processes were falling apart.

Raising the Bar: 5S Implementation

The next kaizen event was a couple of months away, and our focus was still directed toward the struggling engine line and the other processes having difficulty. Because management had not developed a strategic purpose and had not established any way to measure our progress, it was difficult to gauge the financial burden or level of improvement. There was ample room for positive changes, and I felt strongly that the line workers needed a few more things to help them get up to speed. I decided to assemble a small team to start addressing other issues.

On the first day of the first event, the kaizen team had been able to get only so much done, considering that we had been told to start from scratch. However, when we had made the decision to use the time studies, we were able to balance the work content and establish some standard work. Now I wanted to implement 5S in more detail. The kaizen team hadn't accomplished much beyond some bin labeling and workstation signs. My team consisted of the manufacturing and quality engineers on the line, a total of four people. I placed an order for floor paint,

floor tape, labels, bins, and other miscellaneous supplies that would improve the visual effects of the line.

We scheduled the work to be done during a week when the line would be finished by noon on Thursday. After the operators left, the team cleared all the items from the floor. Because the line was entirely on wheels, this was a fast exercise. I highly recommend mobile lines.

The team quickly cleaned the floor in preparation for painting. After the floor dried, we grabbed paint rollers and proceeded to apply the paint. I had ordered a standard color, manufacturing gray. To make the line stand out, we painted the entire area designated for the engine line. The yellow floor tape and other visual markings were easy to see in contrast to the gray floor.

My goal was to finish painting by the end of the afternoon, to allow time for the floor to dry overnight. We would start putting up the visual markings and designations the next day. On Friday, we spent all day placing yellow floor tape to designate anything that went on the floor: totes and bins, parts racks, the path of the carts, garbage cans, and the like. The team labeled everything on the floor with descriptions and quantities (when applicable). The floor designations and labeling took very little time, so we decided to make new labels for the parts bins and reorganize the parts racks. After only one day of work, the line looked very nice and much more organized.

The work performed on Friday did not go unnoticed. On Monday morning, the line operators were the first to acknowledge the improvements. A few production supervisors commented on the appearance and asked when their lines were going to be improved. My manager said that she was happy with the line and hoped it would be sustained.

Improving Work Instructions

The initial kaizen team had established single piece flow, standard work, and 5S. I met with the manufacturing engineer assigned to the engine line and discussed the need for point-of-use work instructions. The current work instructions were in poor condition, and because we had made major changes to the work sequence, new work instructions were needed. The old templates were terrible—too many pages and too many words. These templates were stored in a notebook, which was kept on a shelf near the line. I explained that we needed a fresh

approach. My goal was to reduce the size of the documents—to only two to three pages per workstation—by using signs and icons to illustrate processes rather than an excessive amount of words.

Making this drastic change to company work instructions required that I meet with upper management to discuss our intentions and get approval. The management team was thrilled and thought the idea was great. Everyone agreed that we needed new lean documentation, and the managers decided that when the engine line had been completed, new work instruction templates would be designed and would become standard.

The engineer and I worked every day, updating the work instructions. We held several meetings with the operators and line leads, and they appeared to be in favor of the modifications. The old work instructions were so poor that they were seldom used. The new format would be beneficial for everyday use by the operators as well as for training new employees.

The new work instructions were completed in about two weeks. After the appropriate approval process, the work instructions were installed in the workstations on the engine line. We felt that the improvements to 5S and documentation would help change the culture and get the supervisor to instill accountability in his people. Time would tell.

Lack of Accountability

The engine line followed the new procedures for about a week, and then problems started to arise. Although the line was much more organized and the workers had all the tools, parts, and documentation they needed, the line was performing poorly. Operators resisted the implementation of standard work and the requirement to work at a more productive pace. They complained about the expected pace; the old line had allowed them to work at whatever speed they wanted to, as well as take multiple breaks. They became stubborn and did not want to work as a team. What's more, the production supervisors did not enforce the new procedures, allowing the operators to do as they wanted. The new standards made this behavior readily apparent, and decreases in productivity, volume, and quality were easily visible.

The new engine line was designed to produce 65 units a day, which equaled a 6.46-minute takt time. In fact the engine line was averaging

about 55 units a day and getting increasingly farther behind. The blame fell on the kaizen team, the manufacturing engineer, and me. As a team, we again presented the facts to our management, clearly showing that the line leads and production supervisors were not holding operators accountable or holding them to volume and productivity standards. Blame always fell on the support staff. Clearly, there were commitment issues with upper and middle management.

In an attempt to break through these culture barriers, I scheduled numerous meetings with the necessary people. Sometimes, these meetings were canceled because of lack of attendance or because participation was unproductive. Participants failed to follow up on their action items. Things were quickly falling apart, and I was becoming worried. In addition, during this shaky transition the plant manager was already discussing the next round of kaizen events. Although I am an advocate of continuous improvement, I felt that we needed to resolve the culture issues on the line so that the company could begin seeing quantifiable results. But upper management decided to stop focusing on the engine line because it wasn't making progress. The managers tried to redirect company efforts toward the next kaizen event, and the engine line was left behind and forgotten.

The Second Kaizen Event

At this point, a lot of time and money had been invested in the lean journey and there had been very little reward. It was now July, nearly three months since the first kaizen event. X-Corp was not moving in the direction I was hoping for. There had been a lot of initial excitement and valuable up-front training, both of which are important. However, even with these factors, the implementations were slow and relatively unsuccessful. Some of the other areas that were targeted in the first event slowly returned to their old way of working and discarded many of the improvements. One reason for the return to the old, inefficient work patterns was that new employees were brought on board without the benefit of lean training.

As I've mentioned, it is critical that all employees be trained on, at minimum, the basics of lean manufacturing, as well as how to act and work in a standardized process that is focused on waste reduction. At X-Corp, new operators were placed on the line as soon as they had completed a brief company orientation. Because the production supervisors and

operators were not following the new lean processes, the new employees didn't either. As with many companies going through lean transformation, the culture was not committed to the process.

I still had an interest in the success of the engine line, so I kept a focus on it from a distance. It was difficult to walk away from my own line, but I helped as much as I could. The second event was rapidly approaching, and again X-Corp was bringing in consultants. This time, I was hoping for more participation and guidance. We were informed that the company was sending a different consultant this time around. The X-Corp employees were still disgruntled about the first kaizen event because of the lack of communication and structure. An organized kaizen program (as I describe in Chapter 3) was definitely needed. Nevertheless, the teams were formed and the date approached quickly.

This time around, I scheduled a meeting with the team members who were assigned to me. The event was scheduled for August, so we had some time to analyze the process we were given. This particular line built small heating and air conditioning units for small delivery trucks that transported cold products. It was called the 1065 line. These units were about the size of a 25-inch television. I asked each member to collect data for time studies, inventory analysis, on-hand quantities, and waste analysis. This time I was intent on being prepared and going in fully armed, and no one could persuade me differently. I felt it was time to take this lean journey in a different direction and planned to ask my team to perform the duties needed to implement a lean process and really make it stick.

As with the first kaizen event, we were told not to do any up-front planning so that it could be done by the team during kaizen week. Clearly, this approach had not worked well, so my team went to work behind the scenes. As the weeks passed and the event drew nearer, I spent time on the engine line and the other processes that had been part of the first event. It was obvious that management lacked commitment or accountability in these areas. The 5S procedures on the engine line began to fall apart. Workstations became cluttered, labels and designations were not being followed, and operators were still leaving their workstations. Even with production supervisors standing right there, the new standard operating procedures were not followed. Sometimes, the supervisors would strike up 15- to 20-minute conversations with the operators as the line became backed up with units. As a lean engineer, I was losing patience and did not know where to turn. At the same time, I tried

to stay positive and keep the new team focused on data collection for the next event.

The first day of the second kaizen event arrived. X-Corp gathered everyone into a training room to meet with the new consultant and hear about the week. My team was ready. The members had gathered a significant amount of information about our assigned line. We were ready to hit the ground running the minute we were released from the meeting. The new consultant gave a speech that sounded a lot like the one given by the first consultant—about waste, change, and kaizen. X-Corp's plant manager gave the teams his go-ahead, and off we went.

The other teams walked out with clipboards and stopwatches. We walked out with drills and tools. There would still be plenty of ideas and solutions generated by the team during the week, but we were excited about being already armed with data on the current state.

Most of our team meetings were held right on the floor as we mapped the new line design, with review and insight provided by the operators and supervisors. Having them involved in the design phase was critical to our success, because it promoted greater acceptance from the other workers on the line.

As the event ran its course, the team felt certain this process was going to work—perhaps not from a design perspective, but definitely from the perspective of culture change. The team slowly pieced the line together. We reduced the number of workstations from ten to seven by removing wasted walking and work content imbalances and by implementing single piece flow. We approached 5S head-on, leaving nothing unidentified or undesignated.

It was a satisfying and exciting transformation. As the lean engineer, I wanted the entire plant and all the teams to succeed. We had initially anticipated that the engine line would set the standard and be the model line, but management and production supervision had let the line fall back into inefficient routines. The 1065 line gave us another chance for success.

The team members worked well together. They came up with creative ways to construct the workstations and present tools and material. My manager pulled me aside and expressed her satisfaction with our progress. Looking directly at her, I said, "That is what good up-front planning can do for you."

The second kaizen event came to an end at X-Corp, and the 1065 line looked great. Of course, the real test would come on the following Monday, when the line would run its new processes for the first time. On the last day of the event, I allowed my team to make the presentation to the company. We had put a lot of effort into the 1065 line and placed great trust in the operators and production supervisors to make it work. They all appeared to be well equipped to handle the new processes, and I assured them that the team members, although going back to their regular jobs, would be there on Monday to support the effort.

Giving Up on Lean

On Monday the line went “live,” and all hands were truly on deck. We were determined to make this work. We monitored the line during the entire week, providing support wherever it was needed. The work content needed to be rebalanced a few times, some tools were not in the right places, and there were minor issues with missing parts in the stations—typical minor issues that arise during the transitional phase after a kaizen event. By the end of the week, it appeared that the line was operating to design. Although the operators had not yet reached the newly established design volume, they were getting closer every day. Everything appeared to be going in a positive direction.

During the following week, I began to develop a larger plan for the company’s lean journey. I was just beginning to understand the concepts of a companywide kaizen program, and I wanted to put them into action. The organization needed a governing body to watch over all kaizen events, and I felt that I should be given more authority than the outside consultants when it came to planning the events. I created a four-week timeline for each event, outlining everything that needed to take place ahead of time. It took me some time to put the pieces of this kaizen program together.

Periodically, I checked on the 1065 line to observe its productivity, volume, and quality metrics. The line was doing well, and the operators were following all the new procedures and processes, including the staffing requirements. (X-Corp had a habit of throwing people at a process to ensure that output was generated, not realizing the cost of that approach.) Everything was running smoothly—until changes were announced that would affect every line in the factory.

The production manager began changing the roles of the production supervisors. The 1065 line supervisor, who had been involved in the early phases of our implementations, was assigned to supervise a different line. The 1065 line was to be supervised by someone who had no lean background and had not been trained to manage this type of a process. This individual quickly moved people around, added unneeded people, and forced the operators to ignore single piece flow and create excessive work in process, all in an attempt to increase output. Suddenly, the line supervisor and I found ourselves in a fight to keep the process in control. I was patient at first, explaining to the new supervisor how the line was intended to operate. Although he listened intently, he never followed through with the promise he made to follow our procedures.

For weeks, the former team members and I battled with the supervisor and management. We had numerous meetings about the issue, but we were simply told that we needed to work together. We were losing our control, and the 1065 line was rapidly following the same path of failure that the engine line had followed.

I scheduled a meeting with my manager to discuss the problems and get her support. She told me to let go of the issue, because the production workers were going to run things the way they wanted to. This seemed to be a great time to present my ideas on the new approach to lean implementation. She listened to everything, including my complaints about the engine line and the 1065 line. Then she looked at me, paused, and said, “Well, these ideas didn’t work on the engine line.” I was speechless. She explained that management was unhappy with the way the kaizen teams and leaders had performed their projects over the past eight months. Management was concerned about plant productivity and did not think that the teams had done a good enough job; again, I was speechless.

This was pure management denial. She did not make a single comment about accountability or commitment. Although the teams had made mistakes, as all kaizen teams do, they had worked hard and were very flexible. However, X-Corp’s management had decided to stop holding kaizen events, and there would be no more consultants on-site. Two months later, I resigned.

End of the Journey

What happened to cause the failure of this lean implementation? It may appear that I am picking on management, supervisors, and operators more than any other employees. But change comes from the top of an organization and trickles down through the rest of the company. Change can begin with only a few key people. When they embrace change fully, they can begin to change the culture of the rest of the company. Those who manage the operational processes of an organization must be the ones who drive lean implementation and positively present the lean philosophies so that others will embrace them without resistance. Upper management must show total commitment to the process and must demonstrate its ability to hold people accountable for adhering to the changes.

I could have written a highly detailed book about the struggles at X-Corp, but this chapter is sufficient to show how easily an attempt at lean implementation can fall apart because of poor management commitment. I do not mean to imply that engineers, kaizen champions, and technicians do not make mistakes on a lean journey. They do. However, the key players are the ones who set the vision, and change the company culture, with a firm demonstration of commitment and accountability. That responsibility lies with upper management.

Dealing with any change is difficult, and, unfortunately, there is no perfect template to use as a guide. But as you'll learn in Chapter 2, there are ways to define and develop the kind of insight within your company that will help ease your journey. In addition to having commitment from leadership, you can make your lean program much more successful and fulfilling by avoiding or reducing the kind of small mistakes that companies often make, a topic we turn to next.

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