

## **Executive Summary**

### **Introduction:**

Komatsu Limited was created in a small town called Komatsu, Ishikawa located in Japan. The corporation named itself after the town in 1921. Komatsu is the world's second largest manufacturer of construction and mining equipment, after Caterpillar. After World War II Komatsu Limited opted away from creating military machinery and began created non-military bulldozers. The spark in demand for bulldozers sparked after the war because of post-war reconstruction. In 1967 Komatsu Limited chose to move into the United States market because they wanted to disprove the presumption that Japanese products were cheap and poorly made. Komatsu Limited takes pride in offering a wide array of services to their customers. They are allowed to offer these services and quality through the the Komatsu Way, a guide and set of principles that ensure quality from the company.

### **Methods:**

In the methods section of this report, we researched and elaborated on the what exactly is Kaizen, the history of Kaizen, what a Kaizen event is, how it is divided up in a workplace, and how PDCA is related to Kaizen. Kaizen is a business strategy where all employees work together proactively to help their company improve continuously. Companies go through a Kaizen event to accomplish their goal and reach improvement and success. A tool that is helpful for Kaizen is the PDCA product cycle. This is beneficial for Kaizen principles because it provides a framework and organized structure which will make sure that each project gets completed in the most efficient way.

### **Results:**

In the results section of the report, we conducted an interview with Komatsu Limited. Specifically we conducted the interview with Joseph Kennedy. Joseph Kennedy is a Finance Operations Manager for the company and currently holds a half of year of managerial experience in the field. All the group members that were apart of the report conducted the interview over a conference call and asked Joseph Kennedy a variety of questions relating to Kaizen principles and how they implement those principles in their company. In the interview Joseph discusses a variety of ways on how Kaizen is utilized within their company to improve processes, along with other various tools that go along with Kaizen such as the PDCA cycle, root cause analysis, Gemba, and 4 principles that Komatsu utilizes while conducting a Kaizen event. Joseph also provides some company experiences and examples on how Kaizen events are conducted and some projects that went along with it.

### **Discussion:**

A discussion of Kaizen would be incomplete without mentioning the vast zen tradition that predated it. Kaizen, in many ways, is the Jiu Jitsu of business, and with a proper observance of the ancient treatises of daoist thought many exciting business corollaries will present themselves. This section brings together polarized viewpoints from our own world today, with our source at Komatsu and the speaker from McKesson, as well as from the famous thinkers of antiquity, among them are the revolutionary, Adam Smith, and the great Samurai, Miyamoto Musashi.

## **Introduction:**

### **History:**

Komatsu Limited is a Japanese multinational corporation that manufactures construction, mining, forestry, military equipment, and industrial equipment. The corporation was founded in 1921 and was named after the Komatsu, Ishikawa, which is where the company was founded. Komatsu is the world's second largest manufacturer of construction and mining equipment, after Caterpillar. In some regions in Japan and China, Komatsu has a larger presence than Caterpillar. Originally, Komatsu was created as a subsidiary of Takeuchi Mining Industry to create industrial tools for its parent company. However, Komatsu eventually became large enough to sell to the public, thus Komatsu Limited was created in 1921. During World War II, Komatsu was creating equipment, such as tanks and bulldozers, for the Japanese military. After World War II Yoshinari Kawai took on the role as president of Komatsu. In 1949 it was his decision to venture outside of military equipment, so Komatsu began engineering non-military bulldozers and forklifts to its equipment line. This stride would impact Komatsu significantly during post war reconstruction. The demand for non-military bulldozers skyrocketed. After Yoshinari left as president his son Rioichi Kawai took the position. In 1964, Rioichi proposed that the company should focus on creating a quality product. During this time period the assumption about Japanese made products was that they were cheap and made poorly. Rioichi wanted to disprove this misconception, so Komatsu entered the United States market in 1967 to take on the largest bulldozer maker, Caterpillar. Komatsu entered the market with the company slogan “Maru-C” which comes from the Asian board game Go. Maru-C translates as encircle caterpillar. In the game Go when you

circle an opponent you capture his or her territory, Komatsu wanted to capture Caterpillars large market. A few years later Komatsu began entering other countries like Brazil, Singapore, Germany, Australia, and Indonesia. But, the United States was where Komatsu wanted to establish their dominance.

**Services:**

The success of Komatsu has allowed them to create services within the United States, such as Komatsu America Corporation, a subsidiary of Komatsu Limited. Komatsu America Corporation offers services such as Komatsu Financial, a lender that offers support in new and used equipment financing, the company creates its own product so it has this subsidiary that allows customers to purchase directly through them with competitive interest rates and prices. Komatsu financial also offers leasing program for customers that are not looking to purchase the product long-term. There are equipment credit lines that are in place, essentially this allows customers who qualify to extend credit lines toward the purchase of machines or service work through and authorized Komatsu dealer. Komatsu offers these lines of credit at no cost which allows the customer to preserve bank lines. Komatsu financial also offers flexible terms and payment plans, industry expertise which has been developed for over twenty five years. And most importantly Komatsu financial offers superior customer service. Komatsu has a vested interest in the success of every customer.

**Mission: The Komatsu Way**

The Komatsu Way are a set of statement of values that all workers in Komatsu Limited, even those in upper management, should adopt. If all workers can adopt these values in common, can build a workplace that builds global teamwork that fortifies Komatsu Limited's workplace

capabilities. The Komatsu Way is made up of seven guiding principles based on Komatsu's strengths built by the founder:

- Commitment to Quality and Reliability - "We place top priority on quality over all matters in our everyday work activities and will make no compromise in quality as we move into the future" (Komatsu n.d.).
- Customer Oriented - "By valuing the opinions of our customers, we continue to manufacture the products that customers are proud to own" (Komatsu n.d.).
- Defining the Root Cause - "we always work to find and fix the root cause of problems early in the process in order to prevent the problem from recurring." (Komatsu n.d.)
- Workplace Philosophy (Gemba) - "Workplaces (Gemba) offer information which should constitute the foundation of our policies...Therefore, it is important to understand what is going on in the workplace by making information visible." (Komatsu n.d.)
- Policy Development - "When top management lays out management policies or goals, they shall be clearly communicated. On each level, employees should understand their respective roles, make their activity plan, and follow up on the implementation of their own initiatives" (Komatsu n.d.).
- Collaborations with Business Partners - "When it comes to solving problems, improving operations, or sharing "know-how", we recognize regardless of what department, function, location, or subsidiary we belong to, we all have to work together" (Komatsu n.d.).

- Human Resource Development - “Employees (human capital) are the most valuable asset at Komatsu. The more our employees continue to grow and learn the more the company will benefit from their knowledge” (Komatsu n.d.).

### **Komatsu Limited Today**

Komatsu Limited today is a publicly traded company being sold at twenty seven dollars. Since the beginning of the month the company has seen a downwards trend, however, as of lately the price has begun to increase. The company also has listed on their website an annual report. As of 2017 Komatsu Limited is operating with net sales of 2,501,107 (Millions of JPY) which converts into \$22,079,897,651.35, and an operating income of 271,581 (Millions of JPY) which converts to \$2,397,557,805.15. In Komatsu Limited’s five year summary 2017 has shown a significant increase, and the financial information that is shown illustrates an improvement. Komatsu Limited continues to provide exceptional services to its customers through staying committed to its root goal of encircling Caterpillar while also exhibiting the Komatsu Way throughout the company.

### **Method**

#### **What is Kaizen**

The quality improvement topic that our group researched was Kaizen Principles. Kaizen, also known as continuous improvement, is a strategy where employees at all levels within a company work together proactively to achieve incremental improvements regularly to the manufacturing process. From the article *Improvement of Effectiveness by Applying PDCA Cycle or Kaizen: An Experimental study on Engineering students*, Z. Hasan stated that “Kaizen is a process which

leads someone to a permanent improvement gradually” (Hasan 2). Kaizen is part action plan and part philosophy. It is about organizing events that are focused on helping the company improve in specific areas. As a philosophy, Kaizen is about building a culture within the company where all employees are actively engaged in sharing ideas and implementing improvements. In lean manufacturing companies, it becomes a natural way of thinking for both managers and plant floor employees. One of the most important tasks in Kaizen involves improving the quality of work in an organization by achieving TQC (total quality control). In an online database we used, said it “The kaizen method is now a base model for other quality improvement methods including: suggestion systems, automation, small group activities, Kanban system, just-in-time, zero defects, total productive maintenance, total quality control, etc.” (Debord 2017)

## **History**

Kaizen began after World War II when Toyota first implemented quality circles in its production process. A quality circle is a group of workers performing the same or similar work, who meet regularly to identify, analyze, and solve work related problems. In the academic journal *Kaizen events: an assessment of their impact on the socio-technical system of a Mexican company* it states that, “the Kaizen philosophy has its origins in Japan; it was developed after World War II and comes from the words kai (change) and zen (for the better)” (Arroyo et al 2). This concept became extremely popular in Japan in the 1950s and continues to exist in the form of Kaizen groups. The term Kaizen itself became famous around the world through Masaaki Imai. Masaaki Imai is a Japanese organizational theorist and management consultant, known for his research on quality management, specifically on Kaizen. In 1985, he founded the Kaizen Institute Consulting Group (KICG) to help western companies introduce the concepts and tools of Kaizen principles.

To this day, the Kaizen institute team has applied kaizen training courses across virtually all business sectors throughout the world. Masaaki Imai published two books on business process management “Kaizen: Japanese spirit of improvement” (1985), which helped popularize kaizen principles in the West, and *Gemba Kaizen: A Commonsense, Low-Cost Approach to Management* (1997).

### **Kaizen Event**

A kaizen event is a focused development project that can accomplish breakthrough improvements in a short amount of time, about 2-10 days. Kaizen events must have a clear, concise objective along with immediately available resources and rapid results. This is because companies need to ensure that results are significant, clear and quick to promote the generation of continued enthusiasm and satisfaction. In the article *Conducting Kaizen Events in the Heat-Treat Shop*, Daniel H. Herring stated that “Kaizen events are one of the best ways of accomplishing lean manufacturing, improving the overall operation and promoting morale amongst employees.” (Herring 1) It is extremely important that all employees maintain a high morale while completing all business tasks because it will ensure that they will give it their all and complete the best work possible. Kaizen events typically contain eight steps that will help show immediate improvement in the company. The eight steps are:

1. Defining the problem/goal
2. Documenting the current state
3. Brainstorming and developing a future state
4. Implementation
5. Training

6. Developing a follow-up plan
7. Presenting results
8. Celebrating successes

If all these steps are done properly, Kaizen events can bring huge improvements to an organization.

### **Kaizen Nine Tips**

Kaizen focuses on small, gradual, and frequent improvements over the long term. In order for Kaizen to succeed participation is required by everyone in the organization. Companies that implement Kaizen are able to develop a work environment that adopts the process through Kaizen's Nine Tips. The tips are a set of guidelines that create structure for an employee and show the workforce what is expected and how to perform a Kaizen event. The Kaizen institute states that the first tip is to discard conventional fixed ideas. In order for change to occur conventional ideas need to be broken and individuals should begin to think outside of the box. The second tip is to think how to do something, not why it cannot be done. Team Members and employees should emphasize the end goal, and not the complications that could arise, because they would begin to focus only on the faults. The third step is to not seek perfection. The focus should be to begin the Kaizen event so it can be implemented. Even if you are only reaching fifty percent of your target it is successful. The Kaizen Institute website states that "Kaizen was never designed to allow rapid change - its very nature focuses on making small changes to processes which, in the long run, would lead to significant improvements in product, processes and even people." (Kaizen Institute n.d.). So, as the third step states, Kaizen is not seeking perfection from the beginning, but instead Kaizen events should focus on making small changes. The fourth tip is



do not make excuses but question current practices. If organizations begin to question the current practices, and continue to ask why, then they will find the root cause of process errors. The fifth tip tells organizations to seek the wisdom of ten people rather than the knowledge of one. As stated previously, participation is required by everyone in the organization. This tip emphasizes on participation because if one person is giving all of the knowledge then the Kaizen event has only one path it can take. But, if there are multiple people that share their ideas it involves more people, but it also offers more ideas and wisdom that the one person may have never expressed or developed. The sixth tip states that if you make a mistake correct it right away. The reason the mistake should be corrected as soon as possible is because if the event is carried out with that mistake it can harm the entire process, and the mistake might continue to occur. This will affect the entire Kaizen event. The seventh tip says to throw wisdom at a problem not money. Money cannot buy you success. In a *Professional Engineering Management* textbook it discusses Kaizen being used in Japan. It states that Masaaki Imai, chairman of the Kaizen Institute in Japan says, “We don’t have much money, but you still have to make improvements. Use your brain. And if you can’t do that, sweat it out...Using money to make the change is the easiest solution. In Japan, every time time you want to spend money we say use Kaizen instead” (Howell 37). The chairman of the Kaizen Institute is reiterating the seventh tip of Kaizen. Money is the easy solution to fixing a process but there is always a solution using Kaizen that could minimize costs. The eighth tip is to ask why five times and seek the root cause. If you continue to ask why it can help you determine the root-causes of problems appearing within the supply chain. Ultimately, this gives you the one process that should be focused on entirely to improve the supply chain or process. The final tip, which is a recent addition, is to improve yourself first. And this idea

connects to the first tip that tells companies using Kaizen to discard conventional fixed ideas.

Many times individuals have habits or ideas that are difficult to break. So, workers need to begin to think outside of the box and begin to improve themselves first in order for a Kaizen event to succeed.

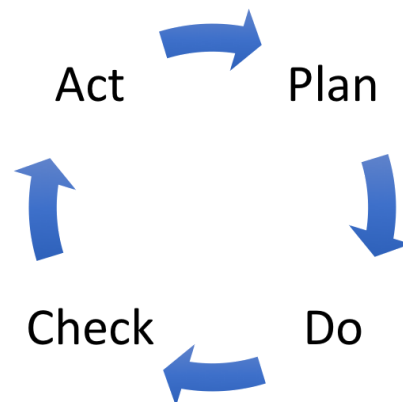
### **How kaizen is divided in a workplace**

Within a company, Kaizen is broken up so that different levels of a business can have their own responsibilities. It is divided up by top management, middle management and staff, supervisors, and then workers. In an academic journal titled *Do All Staff Members Need to Share the Same Purpose?: The Case of Kaizen in a Japanese Hospital*, Masami Abe wrote “Even though the purposes of Kaizen differed across workers, the usefulness of these new activities was communicated as being shared purposes (a) among workers in in the same division where supervisors and subordinates work closely together and (b) among workers performing the same jobs but indifferent divisions.” (Abe 1) These business practices are smart for a company because they have multiple people focusing on the same jobs rather than possibly having too little workers or too many workers for a single job. Top management is responsible for introducing the concept of Kaizen as a corporate strategy and building systems, procedures, and structures conducive to Kaizen. Next, the responsibilities for middle management and staff are to implement Kaizen goals as directed by top management and help employees develop skills and the necessary tools for problem solving. Next, the supervisor’s job is to use Kaizen in functional roles. They improve the communication with workers and make sure they are maintaining high morale, support small group activities, and introduce discipline in the workshop. Lastly, the

workers engage in Kaizen through the suggestion system and the small group activities and engage in continuous self-development to enhance their problem-solving skills.

### **Kaizen and PDCA**

The PDCA process is important for Kaizen. The process supports both the principles and practice of Kaizen. The PDCA cycle is a four-stage process that includes Plan, do, check, and Act. It provides a simple yet effect approach for solving problems and controlling change. In another academic journal titled *Improvement of Effectiveness by Applying PDCA Cycle or Kaizen: An Experimental Study on Engineering Students*, it reads that “It can be used as a guiding tool throughout the improvement project, for the development of specific projects when identified areas requiring improvement, or when anomalies or deviations from standard are detected in existing projects.” (Dimitrescu et al. 2) It is extremely beneficial for Kaizen principles because it provides a framework and structure for identifying improvement opportunities and evaluating them objectively. This will help make sure that each project gets time effectively and in a timely matter.



## **Results**

### **Reasoning**

The interview that we conducted for our project was with a manufacturing and finance company called Komatsu Limited. All the group members from the project got the chance to speak with a Kaizen expert from Komatsu and conduct an interview. This gave them a better understanding of the values of Kaizen and how it relates to Komatsu, or any other manufacturing organization.

The Kaizen expert that we spoke to for this interview was Joseph Kennedy who is the Finance Manager of Komatsu. Although Mr. Kennedy isn't directly in the plant, he still partakes in Kaizen events as a facilitator to improve processes.

### **Komatsu and Joseph Kennedy**

Based off Joseph's past experiences with the company along with training that he received as well, Joseph is now considered to be "The Komatsu Way Expert" of the finance department. He has now been a part of the Finance Management department for 6 months. Joseph stated in the interview that Kaizen is part of "The Komatsu Way" and while the company does utilize other tools to improve processes in the company, Kaizen is a small tool that they utilize. Which also happens to be one of the most effective tools that the Komatsu uses daily in order to improve activities in the company. As a financial manager of Komatsu, Joseph oversees financing that goes into the purchasing of the machines that they sell and manufacture. As Joseph explained, financing is one reason why Komatsu has a competitive advantage over its competitors, because the way they finance their equipment is done a lot better and more efficient than other companies like Caterpillar, which is their main competitor in the industry. As Joseph explained "The main

reasons customers use us is because of our competitive interest rates and the fact that we always strive to be a lot easier to deal with than any other finance provider,” he said. “We believe we are easier to deal with because, as a part of Komatsu Way, and we understand the construction and utility equipment business very well and we understand our customers,” said Joseph. He also said that “to increase its speed of response for smaller transactions, Komatsu Corporate Finance has also invested heavily in a new system to ensure applications are processed quickly.”

### **The Interview Set Up Process**

The interview was conducted on Friday, October 26 over the phone. We originally wanted to schedule the interview as a plant tour, so we can get a better understanding of what happens during a Kaizen event, and how Kaizen events are used to improve their processes in the manufacturing plant. We also wanted to do a plant visit so that we can see how certain process are done. It would have been better to conduct a plant interview because it could have been more of a hands-on experience as well as seeing what goes on in the manufacturing plant during their daily operations. But unfortunately, some complications got in the way between Joseph’s and our schedules since he only works nine to five on Monday’s through Friday’s, and that’s when most of our classes take place. So, we then decided as a group that it would be best to conduct this interview over the phone.

### **Why Kaizen Has Been Implemented in Komatsu (Background)**

As the interview started, Joseph began to explain the background of the Komatsu and how the company has evolved in order to compete in a competitive market today. Komatsu Ltd. is a Japanese multinational corporation that manufactures construction, mining, forestry, and military equipment, as well as industrial equipment like press machines, lasers and thermoelectric

generators. Joseph went through a brief description that Komatsu was founded in 1921 as a subsidiary to Takeuchi Mining Industry which it made industrial tools for in Japan. The company eventually got big enough to where it could form its own company, and by the time of 1931 it produced its first agricultural tractor. Then, World War II came along, and Komatsu had to switch from making tractors and industrial equipment, to making military equipment such as bulldozers and tanks for the war. After World War II, there was a strong demand for nonmilitary equipment such as bulldozers and forklifts to clean up the aftermath of the war in Japan, and Komatsu took that to their advantage to create more construction and industrial equipment. After moving its headquarters to Tokyo in 1951, Komatsu finished their line of products that they created and began to dominate the industry in Japan. Once Caterpillar realized that Komatsu was taking over the Japanese market, Caterpillar wanted to enter the market to compete with them since they already had a line of products. Since Caterpillar entered the Japanese market, Komatsu beat out Caterpillar because they already had a name for themselves in Japan. Since Komatsu had a strong hold of the market in the Japan Komatsu saw the need to expand their company to other parts of the world. Komatsu decided that the United States was the best place to do that to penetrate the market and compete with Caterpillar as the biggest industrial company in the world. In order for Komatsu to compete in the United States market, Komatsu had to find ways to create a competitive advantage in their company in order to stay in the market. This is where Kaizen comes in, and it has been playing a huge roll in their process of change ever since Caterpillar has entered the Japanese market. According to Joseph, Kaizen principles have been used within the company ever since Caterpillar entered the Japanese market, and since Caterpillar was considered to be the superior brand of construction and industrial equipment

around the world, Komatsu needed a way to improve its manufacturing processes along with its technology to stay in the market. Ever since Komatsu has entered the American market, Kaizen has played a role in their daily operations.

### **How Kaizen Events are Utilized in Komatsu**

While most people believe that Kaizen events are only used for projects; at Komatsu Kaizen principles are used daily to try to find ways to eliminate waste, improve productivity, and overall improve a process. Kaizen events are also still used on bigger scoped projects to solve problems in a process such as Komatsu's most recent project. Komatsu just finished implementing a new software for their company that took over a year to complete. Joseph stated at the core of the project, Kaizen events were utilized to solve a lot of the problems that the company faced when implementing the software. Kaizen events are geared towards reducing steps and eliminating waste in processes, as Joseph began to explain how the process begins. If the company is experiencing a problem within the manufacturing process or technology implementation in the manufacturing plant, the company will first find out exactly who is involved in the process throughout the company whether it be the person boxing up the parts, the guy in the assembly line, or in an office environment where Joseph is providing a report for a credit approval for a distributor. It is key that everyone is put into consideration in the process to identify all possible gaps. Once they gathered everyone who is a part of the process, they will begin to evaluate the process for some time by using "Gemba". In the *Experiential Learning: Using Gemba Walks to Connect With Employee*, an academic journal, it states that, "As opposed to management by walking around, a Gemba walk is taking the time to learn and understand the work employees perform. The term Gemba comes from a Japanese word that means "the real place." In lean

management, a Gemba walk is when a member of management goes to the “real place” where work is performed and learns how and why employees perform the work the way they do.”(Gesinger 33) At Komatsu, a Gemba is a walkaround done at a plant to figure out the step in the process that they want to evaluate. The main steps that go into a Gemba walk include: Pick a theme, Prepare your team, Focus on process, not on people, Be where the value stream is, Record your observations, Have an extra pair of eyes, and follow up. They may also use past data to collect certain information. Once they gathered up all their information, management will create a Kaizen team to start the process of change and implementation. Once they evaluated their process and errors, they will try to find the root causes of failure in the process using root cause analysis. There may be more than one root cause to the problem. So the company must evaluate each error by breaking them down into pieces like a fishbone diagram (but contains more details) to see which is the core problem to the process. If it is a complex process you must break them step by step by individual personal responsibilities and look at each part of the step. “Often times for an example where there may be a defective product coming out of a factory, and you may recognize that because you are experiencing customer issues in the field” stated Joseph during the interview. “So, you must dig down and figure out exactly what the problem is or you may miss it if you don't look at it piece by piece by piece.” For example, at Komatsu they thought there was a defective product in the factory, but later found out it was a problem with a part that was delivered from the supplier. So, it is critical that you must identify the process as a whole, and then break it down from there. Once they figure out what the root cause is they must try to figure out ways to implement change in the process. While doing this step in the process of change, Kaizen is at its core during the process and a lot of resources are being allocated



towards this event. The reasoning on why there are a lot of resources allocated towards this event is because there is a ton of documentation that goes along with the process that management wants to see. The reasoning why management requires a lot documentation is to see if the implementation works or fails. This also helps them better guide themselves to see if what they did was correct or if they need to implement a different change. Management is responsible to ensure that all employees that conduct in the Kaizen event are being used effectively. Since Kaizen events take up a lot of time, daily work may be delayed or incomplete. So, management must be there to answer any questions that an employee may have, since they are considered the experts in the field. Management also must be present in order to motivate employees by boiling down possible solutions and making sure the project stays on track and follows the project scope. There are many ways to try to eliminate waste while going through a Kaizen event, but specifically management pushes to utilize their 4 key principles while conducting a Kaizen event. Joseph stated that these 4 principles have been with the company for a long time and were originally written in Japanese. He then translated the key principles to us to better understand the meaning. The 4 key principles that Komatsu utilize in every Kaizen event include: cleanliness in your workspace, organization in your workspace, continuous improvement, and continuous maintenance. With these 4 principles utilized in every Kaizen event at Komatsu, it helps employees recognize and understand ways to improve the process. Once the employees have come up with all possible solutions to the problem, they write them down so management can see possible solutions while testing the solutions.

**After a Kaizen Event**

After the Kaizen team has come up with several possible solutions to a problem, it is critical to test each possible solution to see which solution is best as Joseph stated. By going back to the manufacturing plant to test the possible solutions, management must utilize the “PDCA cycle.” The PDCA is an acronym for Plan, Do, Check, Act and these are the steps taken after a Kaizen event to test all the possible solutions that the Kaizen team has come up with. “While going through the PDCA cycle you are constantly turning this wheel to test out each of the possible solutions by planning the activity, you implement the change, you check it, you verify it, and you act upon it.” as Joseph stated in the interview. By going through these steps, you are trying to implement a change to the root cause of the problem. So, it is vital that you keep turning this wheel and try to test out each solution because if you don’t, the implementation to the process won’t necessarily help you find what the root cause is. Once you find out which solution works best for the process, you must now implement it in the process and closely monitor the process for some time. “If there is a process that has more than one error, then management must constantly monitor the process while going through the PDCA model” as stated by Joseph. Joseph also said that “once you implement the changes you are not going to achieve the results you desired or expected initially. It might take time for the process to settle in. Our company generally thinks more long term when we establish goals. If you are thinking in short term success, then the results are going to be skewed. If you want to have long-term success as an organization, you must have long-term goals.” After a Kaizen event is concluded at Komatsu, the company strides for a 10 to 20 percent improvement and effectiveness. “Oftentimes it is very difficult to quantify such things. Maybe a specific process before would take two hours before, but if you can get that down to an hour and a half you still see a 10 to 20 percent change which is

great!” stated Joseph when talking about the percentage of improvements the company sees when the Kaizen event has been implemented. Once the process has been implemented the Kaizen team at Komatsu would submit their Kaizen activity to upper management for presentations. Anybody in the company would be invited out to the presentation so the workers could see what steps were taken in their kaizen events. After the presentations were concluded upper management would select the best projects and honor the teams.

### **Discussion**

Finally, we will discuss the company's implementation of Kaizen principles, and give specific recommendations on what the company could be doing in the future. In order to recommend an optimum level of Kaizen usage, this section will dig deep into the root philosophy by which the Kaizen methodology was originally inspired. Return to the wisdom of zen and the daoist paths will allow a new, reverent energy to invigorate and inspire Kaizen participants to reach new levels of quality in their business processes

#### **The interview**

In the interview, Komatsu Way master, Josh, discussed some key elements of Kaizen which he practices, eventually he came to mention the length of time their groups take on a Kaizen activity. Josh stated that Kaizen activities could take as long as six weeks to six months to complete; even years in some cases. Granted, Kaizen is not designed for rapid sweeping changes, but this seemed like a surprisingly long amount of time. The company might benefit from implementing more discrete Kaizen events. Our suspicions were substantiated in the talk we heard by Kyle Glenn of McKesson.

In fact, The talk completely changed our understanding of functional Kaizen events.

Glenn recommended very short kaizen event turnover, around a week in length, which contrasted markedly with the long tail implementation scheme Komatsu seemed to be using. At first it seemed that Komatsu may have simply been doing it wrong, however, upon further investigation these rival schools seemed to have more significant reasoning than their binary right-wrong judgements.

### **The length of Kaizen events**

For instance, it is integral for a Kaizen using company to uphold continuous improvement standards, therefore there should be some kind of lasting group of coordinated Kaizen specialists that can, in a similar way that a court upholds a system of jurisprudence, pass Kaizen decisions on to later groups. On a more immediate time scale, the Kaizen groups decisions need to be followed up on; the ramifications of their decisions dissected thoroughly. Not following up will result in redundant workloading and later missteps. Luckily, the follow up of process for Kaizen events has been laid out through the PDCA, Plan Do Check Act process cycle mentioned above. Following this cycle will allow a group to identify the true product issues, but on the other hand it can lead to pitfalls.

One of the major hazards inherent in returning to a process is the ever present danger of “Scope Creep”, wherein the goals of a Kaizen event become too broadly defined. A Kaizen can easily bite off more than they can chew, and a vigilantly holistic view needs to be maintained in order to identify the time when a new project should be defined. To distinguish a correct division, selected goals need to be microscopic and well documented in order to make the work useful to later readers, those who must continue down the same process path. A precise

organization will prepare organized documentation of their results. Later groups will then have access to this quality information and will look at it from future perspective, knowing the exact outcome to the kaizen change.

### **Business philosophy**

It is important here to emphasize the fact that the processes we learn about in business class are not pure jargon, they represent real categories of action, these categories can be flexible, but they really do represent actionable steps through which an individual can take to improve a process. Kaizen for instance, is not just a word. Kaizen is a discussion of first principles. Kaizen principles are inherently organic and though they may contrast sharply with some western conceptions of business development, Kaizen is well suited for the modern business world. It is a natural evolution of specialization in group behavior flowing from the ancient sanskrit traditions of northern india, then the daoists of southern china, and finally the zen tea masters of Japan. Okakura (2003)

Kaizen has its roots deep in the past just like anything else, but it does seem that kaizen has picked up. adoption of zen focused on the perfecting death and rebirth of a given action. Two key concepts to keep in mind when using Kaizen, are the assembly line and the ancient Japanese tea ceremony. Kaizen was first introduced in business practice, for the purpose of revitalizing the manufacture and assembly of machinery, and an understanding of the nature of the assembly line process, as well as a greater knowledge of zen teachings can shed light on the contemporary process; the ways in which the living Kaizen can optimize their modern systems.

First, an approach to refined process design can be gleaned from an idealized assembly line. And the work of Adam Smith in the wealth of nations lines as an ideal form break down the construction of a product into the specific pieces. Smith (2000)

The Wealth of nations, in a discussion on the manufacture of needles, describes how Assembly, lines and manufacture generally, become faster as its steps become more acutely specified, as necessary labor is broken down into the smallest quantifiable processes. This sentiment should always be kept at hand when going through a Kaizen event, and though Smith was not a zen master, his work has paved the way for manufacturing in the west, and it is through a collision with western manufacturing that zen practice has spilled over into the mass manufacture of products.

Zen practice has had a long history of development in Japanese society, and a full recitation of it has filled numerous libraries, however, the tea ceremony, a key practice in daoism, one of the three artistic appreciations of zen practice, exists to this day as an idealized lean process. This ceremony takes its place in the greater context of wabi sabi spiritualism, and the tea itself represents an economic and cultural source that still affects our lives in subtle ways today. Kakuzo (2003)

## **Zen**

Zen practice in its long journey towards the modern day has been used to focus the sentiment of the parts of the body, to the sovereign will of the whole. In the modern day, with the advent of new kinds of track, and surveillance devices, draws a slightly dystopian thread from the ancient tradition. Modern dangers like Companies stalking us on social media, will continue to affect our

daily lives, in the case of China's sesame score, and NSA scandals, analysis will only get stranger moving forward..

## **Human tracking**

Human tracking in the workplace, broadly, will continue to progress. An example of an existing practice was given to us during the McKesson talk. What we learned was that McKesson tracks the efficiency of their employees walk times, and has judged human transportation to be the most cost effective way to transport their products.

Naturally, Amazon was referenced, with their utilization of “roomba like” transportation bots. McKesson's position was that they would need to have a shorter payback period in order to implement this kind of system, however, it seemed to be assumed that switching to Robot pick movers will eventually push out the need for human labor and those few at the top of the process will achieve an increasingly wizard-like status.

This robot run future does have many obstacles to overcome. After all, The human toolset is a default in any manufacturing process, and a good Kaizen group should emphasise these human tools held in the body,, to create comfortable streamlined processes for its operators. Tailoring tools to the motion of the body is referred to as ergonomics, but the broad branches of zen practice also bring value as it was this influence that inspired many martial arts, including Jujitsu. The inspiring teachings that led to the development of this art are set in an understanding of Void, or vacuum, an emptiness that draws in. Musashi (2004) This principle can be used in the business world by understanding that these empty spaces are a utilizable resources in and of themselves. Not only should a company look at the logistics of their products, but in certain

situations the inverse should also be analyzed. The logistics of capacity. Capacity is not the only thing that occasionally isn't used.

Great implementation of Kaizen systemization may reduce the need for a full human toolset set, leaving some body parts hanging uselessly. However, even if a person's full capacity is not required, the full set is still accommodated. A chair for example, represents an accommodation for legs that are not in use. Chairs and other accommodations like them should be carefully used, as their implementation will in fact encourage disuse. If leg disuse is the purpose of implantation then use of chairs may be advisable. Facilitated disuse can be understood as another use of void, and should be considered in a Kaizen meeting.

To draw an antithetical line to the system segmentation process, some tasks can occasionally be consolidated into cascading supertasks, where no down time is spent between events. However this should not undermine the speed achieved through specialization, doing only part of a task may allow multiple cases of that task to be completed in quick succession. However if the downtime between tasks has been drawn down near zero. It may be more cost effective to systematize the consecutive functions together. This is especially the case if these two processes are not in series, but occur before meet up at one location, like the joining of two tributary streams. Special instances like this may allow for optimization to take, essentially, a single motion to complete two or more tasks. A complete lack of wait time should be considered an ideal especially on a system's critical path.

Along with the physicality of zen practice, the deep humanisms of Kaizen can direct users to specific cost saving business practices. This might be considered to be an overly utilitarian analysis of zen practice, but in fact, these among other analogous philosophies of



quality affect the business world directly. They have had an essentialist bent from the beginning and represent specific guidestones and ideologies that exert a refining force on business structure, even today. However, This refining force is not always comforting, and may not seem benevolent.

Webley & Cartwright, (1996) refers to Bretton (1991) who gives a critical view of TQM. Which Webley & Cartwright broadly equate with Kaizen. In Bretton's study of engineering companies in Leeds, Bretton found that the introduction of TQM “ had reversed a general trend for the workforce to become less skilled but had at the same time increased management control.” He points out that the 'humanist' aspects of TQM have nothing to do with managerial altruism: the active enlistment of worker's ingenuity, initiative and cooperation creates a quality conscious and cost-effective Operation. The management of a company like McKesson bears this out in their implementation of employee foot traffic tracking. Inside their facility a great degree of security is needed to ensure the safety of sensitive pharmaceuticals. However, this tracking data was then implemented by management to track the productivity of their pickers. Glenn (2018) This kind of decision is logical on the part of McKesson management, but seems to carry with it a kind of dehumanizing sentiment focused on the pickers. Management shifts subconsciously from a giver of instruction more towards the position of the worker itself. After all, if the management sets the path, and monitors the leg movements of its pickers, how much is the worker really doing? This centralization factor is there in many elements of Kaizen and TQM. This kind of change, though it may be off putting, may lead to positive outcomes when perfecting a system.

## **The Tea ceremony**

Looking back to the example of the Japanese tea ceremony, we may see a more individualizing humanism. The tea ceremony, when done alone, represents a conscious decision in the mind of the tea preparer, followed by a perfect execution of the decided action. The body, in its perfected action, becomes the perfect crucible of the will. By distilling down the necessary steps to a process the pure moment of will, a command from the mind, becomes the only remaining factor. “I want to drink tea” “I want to process this loan agreement” these processes should be executed, and when they are done well, why turn kai around and praise the waste that has been cut off. I would argue we should see humanity not in the mechanics of human action, but in the moment of will.

It is only once this metaphysic is assumed that a true criticism can be made of Kaizen. With the assumption that humanity is perfected in the moment of will, the cognitive function of groups must be analyzed in a very different way. Take this group for instance. The function of this group is to write a twenty to twenty five page paper on the topic of Kaizen. This can be assumed as the the moment of will, passed down from a particular origin, in this case, from doctor Mcfadden. However, unlike a tea ceremony, each motion of the body has not been set in stone. Each member of the group must put in their own work and must find what is referred to in Kaizen as the Genba, or “actual place” where value is added. Cognitive steps are created and executed by each member in order to carry out the higher will at the heart of the project. Here it may be important to return to an analysis of the definition of Kai-Zen. Google translates (Kai)-(Zen) directly to (a meeting)-(all) contextually, in Japan, the terms meaning is purely (Kaizen) = (Improvement). Traveler (2003) rather than the colloquial “Continuous

improvement” In fact, the continuity of the improvements is not definitionally held within the meeting itself. It is only when the process can be executed and becomes reproducible, it is only when the process becomes fossilized, documented, set in stone, that the improvement can be kept from evaporating. This does happen. In the talk given by Kyle Glenn, he referenced acceptable occasions when Kaizen events could be regularly replicated. However, in most cases a redundancy like this should not be necessary. And the instructions or improvements developed by the Kaizen should be set into the body of the company. In the future the will set out by the company can be more perfectly executed through this newly perfected process. In a broad sense a Kaizen should always try to save the knowledge brought to the company by a Kaizen event, this can be done through all sorts of documentation not only with CPHFFRS documentation (Check sheet, Pareto, Hist... etc.) but by any sort of reliable documentation. If kaizen were to be embodied in the process of writing this paper, a rough outline, notes, a microsoft project file and many other things might be saved and given to the next group who got this assignment. Similarly, as a recommendation to Komatsu, it should be a prime goal for the company to offload each employees cognitive effort to specific documented Kaizen events. A full offloading is of course, Impossible. Individual employees can benefit from working through an issue, so in some cases it may not be beneficial to document every finger motion and required thought for a process executor. Sometimes employees need to regularly think about their job outside of the Kaizen meeting, and it can be beneficial to develop the wiley ingenuity of good employees. That will go a long way in bettering the business.

## Discussion Summary

Through a return to the deeper elements of Kaizen, zen, and daoist thought, the modern practitioners of the Komatsu way, among other practitioners of Kaizen, can find cost and time saving strategies to revitalize the way their company does business. Kaizen idealizes the way business philosophy affects real-world processes, and will continue to affect us in ways that we don't yet know.

## Appendix: Interview Questions

### **1. How long has your company been using Kaizen principles?**

“Kaizen has been used longer than I know, I don't know the exact date that it would it would probably be, but in general the principle of Kaizen is the the thought that you are continuously improving all activities.” because he continued to explain that early in Komatsu's life when it was still a primarily a japanese product sold in Japan. Caterpillar started penetrating the market in japan, and began making a product that was superior, and there was a recognition of the superiority of the Caterpillar product over the Komatsu product, which became evident that improvement on the manufacturing and technology was necessary. He would say that “probably at its core when the need of Kaizen is recognize.” He also stated “it probably started in Japan so it could compete in the japanese market since Caterpillar was penetrating the japanese market which Komatsu had a strong hold of.”

### **2. On average how long does it take for your team to go through a Kaizen event?**

“It depends on how substantial the event is. Largely a lot of times it will be used for significant projects, but at its core Kaizen can be small improvements which could happen over days. A large significant project can be anywhere from 6 weeks to 6 months, depending on the scope.”

### **3. Based on the last question, if it is a bigger project is Kaizen used every day?**

“It depends, if you are looking at a specific process that is you recognize that is challenged, it can take a lot of research, and we use all kinds of tools to diagnose issues and depending on the significance and how many people are involved in a specific process, you might end up having to lean on other departments, lean on distributor staff, lean on manufacturing. And the more people that are involved, the longer it will take.” He also stated that “Kaizan doesn't necessarily have to be such a large scale thing, it can

be something as simple as how you utilize specific tools in your own specific job day to day.”

**4. When does your company decide when Kaizen principles should or shouldn't be used with a problem in the company?**

**5. How do you prepare for a Kaizen event?**

“Well you would have to do an evaluation of the process that you are looking to improve on. Recognize all parties that play part in the process. Understanding who your customer is and who is receiving your work. And once you identify all the people involved, you really have to recognize what the root cause is using the root cause analysis. He also stated that “there may be more than one root cause so you really need to investigate each so you can decide what is the core problem. Kind of like a fishbone diagram, but root cause goes a little bit deeper and actually evaluating the process.”

**6. What happens during your kaizen event?**

“Well, there is lots of documentation. Ultimately with a kaizen event you want to be able to verify results how the improvements which you are going to implement can improve your productivity and efficiency. But then he began talking about how you will be surprised that Kaizen events don't work all the time and stated “Sometimes you will enter into a Kaizen event and you will find that while you do identify that there are gaps, you may find that your potential solutions may not be effective. That makes the event no less effective, the fact that you are doing the investigation and trying to identify gaps in your processes adds value. But repeated efforts are typically needed.”

**7. What are specific ways that Komatsu have implemented to eliminate waste, improve productivity, and sustained continual improvement through Kaizen?**

He did say while he does not work in the manufacturing plant, and that he was part of the finance department. But he did say that since Komatsu is a manufacturing company a lot of the Kaizen events that they hold are geared towards improving. He stated that the events are “geared towards reducing steps, by reducing steps you are reducing waste.” He then began talking about their 4 principles in the company that they use for Kaizen events and stated “cleanliness in your workspace, organization in your workspace, continuous improvement, and maintenance.” He said those are 4 key things you have to remember when you are going in on the factory floor and evaluating the process since that is what Komatsu values. He then stated “by doing those 4 steps you are going to be much more effective when conducting a Kaizen event.”

**8. Why do you believe some companies fail to implement Kaizen effectively? What would be your advice to them?**

He began to talk about that he used to work for a different company before, and that they didn't actively utilize Kaizen events as Komatsu did. He then stated that “most companies probably don't utilize Kaizen since it takes a lot of effort, and that usually for most companies Kaizen isn't a business decision, and that it's something that you should use whenever you are solving problems.” He then began talking about what are the advantages that Komatsu has gained over using Kaizen events that other companies are utilizing and stated that “if you are not using Kaizen principles, you are probably taking short cuts, and you are not thoroughly thinking about it.”

**9. Since you are considered to be a part of the financial team at Komatsu how does Kaizen differ from department to department? For example, is there any sort of differentiation between the finance department or the marketing department?**

“When it comes to kaizen being utilized from marketing to finance, even to the manufacturing floor, the principles are the same. The only difference is the problems that you are encountering that's the only difference.” He continued to talk about how you still utilize the same steps the only difference is that “his product might be a spread sheet or a report that I am sending to somebody, where as the issue or problem you might deal with on a manufacturing floor might deal with a defect in a part, a problem with an assembly line, or a bolt that is not tighten. But how you would use Kaizen to come up with a solution to the problem would be the same.”

**10. Why does Kaizen work well for Komatsu opposed to a faster pace process improvement practice like Kaizen Blitz?**

He stated while his company does not utilize a Kaizen Blitz, he said that coming up solution while using a Kaizen Blitz might not be the best for his company or any other company because while you can come up with a solution in 2-3 days, but he stated “rushing it also leads the opportunity to not finding a root cause to the problem which is critical.”

**11. Has your company seen drastic improvements since using Kaizen principles, or since you have been apart of the team?**

“Since I have been apart of the team for a half of year honestly no, I haven't seen drastic improvements. But since the company has implemented Kaizen absolutely. It went from a small japanese company, market was primarily only in japan. Minded that they dominated the market before CAT came on board, and they are still dominating the Japanese market and ever since grown into a worldwide company. But overall ever since the company has implement Kaizen it has seen better improvements in the North American Market since it has a bigger market.”

**12. How do your employees cope with using Kaizen? Do they feel Kaizen is the best way to improve the company?**

“I would say in general employees recognize that the fact that Kaizen is the best way to improve the company. The persistence that you get is the thorough documentation that is

required.” He continued to explain that “kaizen is there so you can identify what needs to be fixed in a process, but there is a lot of documentation that the company wants and that takes away a lot of your time and sometimes interferes with daily work.” he said that is the only resistance that some employees face when implementing kaizen.

**13. When did Komatsu first begin using Kaizen principles?**

**14. What are the specific improvements your company has seen? Has there been any negatives from using Kaizen?**

“Have I seen any negative results, no. I don't know how to expand on that, but I would say in general if you are using Kaizen and you are using it properly there are no negatives to it that I know of. To me if you are going through all the steps and processes the only thing that you can do is discover new more significant problems.” he also stated that the company pushes Kaizen as opportunities to improve.

**15. How do you boil down complex improvement ideas for your staff?**

“Well you got to dummy them down, and break them into pieces like fisbones. If it is a complex process you have to break them step by step by individual personal responsibilities and look at each part of the step. Often times for an example where there is a defective product coming out of a factory and you recognize that because you are getting customer issues in the field so you gotta dig down and figure out exactly what the problem is or you can miss it if you don't look at it piece by piece by piece.” For an example they thought there was a defective product in the factory, but later found out it was a problem with a part that was delivered from the supplier. “So you must identify the process as a whole, and then break it down.”

**16. Does your company utilized kaizen software to help your organization identify, act on, and measure the impact of improvement during an event?**

“No, not that I know of.”

**17. Do Kaizen events held within your company tie between lean processes, six sigma, or Total Quality management?**

“Do they tie into that? Absolutely! All those principles (as we look at Kaizen) tie into the Komatsu way which are closely tied into Total Quality Management. Kaizen is one of the tools that is used to achieve Total Quality Management. That is probably the best way that I would put it.”

**18. What goes into the planning of a Kaizen Event?**

“Start with identifying which process that you are looking to improve. Then you got to identifying all parties that play a role with the process, weather it be the person boxing up the parts, the guy in the assembly line, or in an office environment where I am providing a report for a credit approval for a distributor and show where he I am getting my information from. So you need to put into consideration that everyone who is in a role of

a process will have a role in the event and then identify any potential gaps in the process, and then thoroughly testing the implementation in each processes.”

**19. What knowledge must the facilitator know when holding a kaizen event? (How specialized are the facilitators knowledge of kaizen)**

“As a manager you have to instill a culture that Kaizen is the way of things in this company, and this is the way you should go about your daily work. You should always considered ways to improve, and its the burden on managers and leaders to recognize that just because this is the way that things have been done doesn't mean that it can't be done better. So through coaching and training I would say is to ensure that all employees are utilizing Kaizen and then helping them develop the skills to implement the solution.” he then stated “ you need to have the recognition and the desire, so coaching and motivation needs to be there.”

**20. Are kaizen events held to only solve one problem in the company, or are they used to solve bigger problems such as a project?**

“If I think about it, we have projects all the time and they are not considered kaizen activities as far as by definition but like we are doing a software implementation right now that is not kaizen, but the reason why the project was approved is because there is a recognition and an acknowledgment that there is a need to improve our current software, so its not considered a kaizen event necessarily, the implementation of the software while its taken over a year at its core it is Kaizen” so ultimately projects are considered Kaizen as well but are not viewed upon that way since the scope is so much larger.

**21. Does your team ever utilize a Kaizen Blitz?**

**22. After a Kaizen event, what are the steps taken after to implement the improvements?**

“After a kaizen event we go through the PDCA cycle (Plan, Do, Check, Act). so, the idea is that you are constantly turning this wheel.” Which will go with any kaizen event. “So you keep doing this by planning your activity, you implement the change, you check it, you verify it, and you act upon it. And you keep turning this wheel so you are doing it repeatedly to insure what you implemented in your kaizen event is actually affective, and that goes with finding the root cause.” For an example if you find a root cause and dont keep turning that wheel, you won't necessarily find that root cause.

**23. What qualifies as a successful Kaizen event in your company?**

“I would say that any Kaizen activity that is done completed thoroughly. Like we talked about earlier your first result might not actually be a positive conclusion that you might be looking for, but if you go through all of the activities and all the steps, I would considered to be a successful kaizen event, strictly because recognizing that there is an opportunity for an improvement; going through all the processes and verifying that you are verifying what you are doing what you are supposed to do and you are maximizing all of your resources, thats a successful kaizen activity.”



**24. What is the percentage of improvement does the company see when the Kaizen event has been implemented?**

“It varies if you can quantify results, I would say that we stride for 10 to 20% improvement and effectiveness. Oftentimes it is very difficult to quantify such things. Maybe a specific process before would take you two hours before, but if you can get it down to an hour and a half you still see a 10 to 20% change.”

**25. What goes into training to become a Kaizen facilitator for your company?**

We skipped this question.

**26. How does your company define measures of improvement for Kaizen?**

We skipped this question.

**27. Does your company do a presentation of what you guys have accomplished after a kaizen event?**

“Yes, initially when Komatsu wanted to heavily focus on Kaizen there was a quarterly contest where you would submit your Kaizen activity. It would be placed on a board and the activities would be presented and quantified. You would go in front of a board, and anybody in the company was invited to watch the presentations so the workers could see what steps were taken in your Kaizen event, and the board would select the best ones. Komatsu also has a biannual company meeting where the top Kaizen events would be presented in front of the company. The presentation shows to the rest of the company what was able to be improved.”

**28. How do you gain commitment and understanding from management before holding a Kaizen event?**

“Primarily by defining what the process is that you are going to improve. Have a baseline of what it is exactly that you are going to do and what research you have conducted. Put your ducks in a row. Once you get your approval then you are going to do more in depth research and testing.”

**29. Does management provide a role in Kaizen events?**

“Absolutely, primarily as we discussed before. Two Kaizen events can take up a lot of your time during the day. Oftentimes we expect people to take on Kaizen and doing the event may cause some delays in your regular daily work, and management has to be aware of that. They have to be a resource for you. And, the expectation is that the manager should also be the expert, so the manager should be there as the number one resource to any Kaizen event.”

**30. In an area having repeated events, how much time should be allocated between events to allow for the behavioral and process change to stabilize?**

“I would say there is probably no specific timeline, but the process changes that are implemented are closely monitored. And this goes back to where we have the PDCA model. It should be constantly monitored. I do agree and understand that when you implement changes you are not going to achieve the results that you desired, or expected

initially. It might take time for the process to settle in. Our company in general thinks more long term when we establish goals. If you are thinking in the short-term success then the results are going to be skewed. If you want to have long-term success you have to have long-term goals. It depends how long you give it until you realize that your implementation is bad because if you hold on to it too long it's just negative. I would say depending on the scope of the project you should just keep a close eye on it. But, there is no specific time that I can give you.”

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